A Framework for Evaluating Banking Information Systems in Nigeria

By

Rotimi Adediran E. Ibitomi

Thesis submitted in fulfilment of the requirements for the degree

Doctor of Philosophy: Informatics

in the Faculty of Informatics and Design

at the Cape Peninsula University of Technology

Supervisor: Prof Tiko Iyamu

Cape Town

Date submitted:

DECLARATION

I, Rotimi Adediran Ekundayo Ibitomi, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

Banking institutions in Nigeria are increasingly investing their financial resources in IT solutions. This is with the aim of enhancing their competitiveness, profitability and sustainability. To meet their objectives and goals, the Nigerian banks engage the services of information technology (IT) solutions in the processes and activities that are involved in the delivery of their products and services. The problem is that poor services continue to be rendered to the clients and business partners. Thus the need to find out whether the IT solutions that are selected and deployed for business activities meet the purpose for which they are implemented.

Poor services continue to be rendered because the IT solutions that are selected, deployed and used by the Nigerian banks are challenged by both technical and non-technical factors. These factors that challenge the effectiveness of the IT solutions persist because the banks do not consistently and effectively evaluate the information systems that are selected and used for their business processes and activities. Adequate evaluation of IT solutions that are selected and use for business processes and activities is vital for achieving an organisation's service delivery goals and objectives. Thus, the study's objectives is to identify, examine and gain an understanding of the factors that affect the selection, deployment and evaluation of the IT solutions that are used by the Nigerian banks. This understanding will help the study achieve its aim which is to develop a framework for the evaluation of the banking information in Nigeria.

To achieve the objectives of the study, the qualitative research methods was followed. This was used in combination a multi case study research approach. Two banking institutions in Nigeria were used as cases in the study. Data was collected from the cases using the semi-structured interview. The data collected were analysed using the actor-network theory (ANT). The four moments of translation from ANT's perspectives was as the tool that was used to analyse the empirical data collected. The interpretive approach was used by the study in the findings and interpretation.

Based on the critical analysis of the data collected from the Nigerian banks used as cases, the study identified some factors that affect the selection, deployment and evaluation of IT solutions that are used to deliver their services. The factors include requirements, process-oriented, alignment, random-approach, scalability and reliability, stock of knowledge,

internalisation, IT governance, externalisation and change management. Based on these factors, a framework for the evaluation of banking information systems in Nigeria was developed.

Table of Contents

List of Figures

List of Tables

APPENDICIES

GLOSSARY

Terms/Acronyms/Abbreviations	Definition/Explanation
ANT	Actor-network theory
Artefacts	Technology objects, methods, processes and documentation.
Banking information systems	Technology hardware and software used for collecting, processing, storing and disseminating information in banks.
Evaluation	An assessment of information systems employed to determine value or worth.
IT Solutions	Information systems and information technologies solutions employed by organisations to achieve with goals and objectives.
System Challenges	The problems preventing information systems and information technologies from achieving the goals for which they were employed.
IS/IT	Information system and information technology

Chapter 1
Introduction and Background

1.1 Introduction

Organisations are engaging the services of information technology (IT) solutions to deliver products and services to their clients and business partners. Increasingly, organisations invest financial resources in IT solutions, to enable and support their business goals and opportunities (Stair & Reynolds, 2017). Thus, it is important to identify whether the IT solutions that are employed help to achieve an organisation's objectives. Worldwide spending on Information and communication technology (ICT) has increased from $2.7 trillion in 2001 (Gartner, 2002) to $4.5 trillion as at 2017. This is according to the research that was conducted by International Data Corporation (CompTia, 2018). A high percentage of these ICT projects failed or were challenged to justify investments. For example, an assessment report by Standish Group in 2016 states that seventy-one percent (71%) of the projects did not achieve the purposes for which they were conceived.

Despite this huge failure rate, businesses look up to these solutions for product and service delivery. Businesses in developing countries, including Nigeria, are not left out in the drive to implement and use IT solutions for their processes and activities (Avgerou et al., 2016). In response to the need to deliver efficient and competitive services, banking institutions in Nigeria are increasingly investing in IT solutions (Oluwatolani et al., 2011). However, there are numerous challenges such as systems downtime, system performance, systems' coexistence, and network complexities, which affect and influence the implementation and use of IT solutions in banking institutions (Ganesh & Mehta, 2010). Another serious factor of influence is cyber-attack and poor connectivity (Lei et al., 2014).

The lack, or limited evaluation of banking IT solutions can be attributed to IT projects failure in banking institutions in Nigeria. The failure of IT solutions is a major challenge, in that it leads to over cost, over time (Chung et al., 2015), and as a result, some organisations are not able to achieve their strategic objectives and goals, which affects competitiveness (Jaafreh, 2017). To bridge the gap between the expected IT solution's objectives and its very high failure rate, there is a need for evaluation. The purpose of IT solutions evaluation is to determine whether value accrues to the organisation from its adoption and use of the IT solutions (Ababneh et al., 2017). A customised framework to evaluate the Nigerian banking information technology is

needed to avert these frequent challenges affecting service delivery. In this study, IT solutions refer to banking information systems.

As will be elaborated in the background section 1.2, there is historical perspective to the challenges which the banking sectors in Nigeria encounter. The challenges are articulated in the research problem section. This includes the manifestations of the challenges. The methodology that will be employed to address the problems are stated in section 1.5 of this chapter.

This chapter is divided into nine sections. Section 1 introduces the area of study and the background to the study. Section 2 and 3 discuss the background to the research problem, the aim and objectives of the study. Section 4 covers the review of literature, which will reveal the gaps in existing studies in relation to the research area and thus bring this study into context. The review areas are banking services in Nigeria, information and communication technologies (ICT) employed for banking services, evaluation of information systems and Actor-network theory (ANT). Section 5 discusses the research methodology which includes the philosophical assumptions, research approach, research methods, research design and research tools that were applied to address the research questions and to achieve the objectives of the study. Section 6 covers the ethical considerations that will be adhered to in accordance with CPUT ethic. Section 7 addresses the delineation, timeline and budget of the study. Section 8 covers the significance and contributions of the study, which includes contribution to theory, methodology and practice. Section 9 concludes the proposal.

1.2 Background of the Study

This research was triggered by the researcher's personal experience. The researcher has over 15 years of working experience in the Nigerian banking sector. As an employee of banking institutions in Nigeria, the researcher experienced many challenges, which IS/IT solutions bring to the fore, including its implications. Examples from the researcher's experience are as follows: Nigerian banking institutions use a system called "the Nigerian Interbank Settlement System". In one of its 5 February 2018 challenges, 200,284 failed e-transactions were recorded in a day (Ogunfuwa, 2018). There was a huge financial consequence because of the system failure.

Another of such researcher's experiences is the frequent network failure which results in ATM, point of sale and other service delivery channels availability challenges. Due to the frequent systems failures; customers are often frustrated because of extended waiting time or non-availability of these service channels resulting in loss of time, income and businesses. The IT solutions used for service delivery is unreliable and this poses a challenge to effective banking activity in Nigeria (Okechi & Kepeghom, 2013).

From experience, the researcher understands the implications for the banks, from the Nigerian perspectives. More so, as a banking operation personnel, the researcher has had to contend with IT solutions failures many times. When these banking IT solutions fail, services are disrupted, and this primarily affects the type of services that the banks offer to both their clients and business partners. Also, the IT solutions failure can cause security leakages (Hussain et al., 2017). Many banks have been attacked during IS/IT solutions downtime or failure. In addition, IS/IT solutions downtime or failure affects other sectors that depend on the bank's operations e.g. the monetary and stock trading businesses (Tworek, 2018).

The combinations of these factors as stated above are what formed the background of this study.

1.3 Research Problem

As with other sectors, clients and business partners request for improved services from Nigerian banks. The banking institutions are aware of the clients' need for efficient services and are rising to the challenge. The increasing level of competition is also forcing them to integrate new technologies to retain their customers. The problem is that the banking information technologies that are used to provide those services are frequently challenged by technical and non-technical factors. On the technical front, the challenges include factors such as low availability, low performance and security breaches in the IT solutions (Lei et al., 2014). Some of the non-technical factors include processes, misalignment of strategies, IT personnel skills and management approach (Almalki et al., 2017).

These challenges have brought to reality that Nigeria banking sector IT artefacts are challenged, and this has put its reliability to test as expected services are not delivered to clients and business partners. Maintaining reliability, security and accuracy of IT solutions in organisations is a big challenge to IT management (Islam et al, 2016). Dwivedi et al. (2015)

assert that despite the efforts to understand the underlying factors, IT solutions failure rate remains stubbornly high.

These problems exist primarily because either the IT solutions used are not evaluated or not frequently evaluated, which affects early detection of deficiencies. The lack of effective and efficient evaluation of IT solution is because of non-existing customised framework to do so. Thus, this problem affects both the customers and the service providers (banks), from the perspective of competitiveness, profitability and sustainability. Consequently, this problem of lack of appropriate framework to evaluate the banking IT solutions affects the economy of the country, in that poor services continue to be rendered, and increase losses in millions. This problem is prevalent in developing countries like Nigeria that struggle to have and implement a customised framework to evaluate their banking IT solutions.

1.4 Research Questions

The main research question is how can the challenges that affect IT solutions used for banking activities in Nigeria be addressed? In order to develop a framework, the current challenges must be identified and understood. In answering this main question, sub-questions were formulated as follows:

1. How are IT solutions applied for banking activities by Nigerian banks?
2. How are IT solutions identified, selected and evaluated in Nigerian banking institutions?
3. What are the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria?

1.5 The Aim and Objectives of the Study

The aim of the research was to develop a framework that the banks in Nigeria can apply in the evaluation of IT solutions used for their business processes and activities. The intention is to enhance the support and enablement of the IT solutions, to improve the services that banks provide, including its competitiveness, profitability, sustainability and reliability.

Based on the aim, the objectives are as follow:

1. To establish how IT solutions are applied for banking activities by Nigerian banking institutions
2. To examine and understand how IT solutions are identified, selected and evaluated in Nigerian banking institutions.

3. To examine and understand the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria.

Based on the findings from the objectives a customised framework will be developed.

1.6 Literature Review

To have an in-depth understanding of the intended field of study, it is important that a review of studies that have been published in this respect and related field be carried out. This will place this study in the context of its contribution to understanding the research problem being studied. It will also give insight into what has been done and gaps yet to be filled in respect of evaluating information systems.

1.6.1 Banking services in Developing Countries

Banks are financial institutions which mainly intermediate between units with surplus fund (depositors) and deficit units (borrowers) in need of funds. According to Ofanson et al. (2010), banks are the hubs of productive activity that perform the vital role of financial intermediation and effecting good payments system as well as assisting in monetary policy implementation. The banking services in developing countries like Nigeria have in recent years transformed, aided by the adoption of information technology (Krishna, 2015). The intense competition within the banking sector has driven banks to innovate, compete, and generate value for customers with long-term benefits (Campanella et al., 2017). This is being achieved through the adoption of information technology. This technology-aided banking services have not only brought with it diverse, quicker and more efficient service delivery, but also wider reach in coverage area and an increase in number of banked.

The Nigerian banks offer different services to their customers and partners. The traditional banking services, including account opening, cash deposits and withdrawals, funds transfers, loans and advances as offered hitherto are being re-engineered (Tiwari & Kumar, 2012). The adoption of technology in service delivery has opened new markets, new products and services, and delivery channels (Rajesh & Palpandi, 2015). The new services include electronic, mobile and internet banking, online account opening, loan processing and credit administration, funds transfers, cash withdrawal and deposit (Automated Teller Machine), and other self-enabled services.

These services are however not delivered as expected and thus frustrating the customers from getting efficient and effective service delivery. Systems downtime, slow system response, network complexities, cyber-attack and poor connectivity (Lei et al., 2014) are some of the major challenges experienced.

1.6.2 ICT for Banking services

The customers' demand for better services and the drive to meet this demand are driving the banking institutions to adopt information and communication technology (ICT) for service delivery. Banking information systems are classified as IT solutions, which include hardware and software, processes and people that are employed by banks for their services (Georgescu & Jeflea, 2015). They are hardware and applications which ensure data entering, processing, storage and are operated by specialised personnel. They facilitate ATM operations, online banking, back-end operations etc. They have become the live wires on which banking operations run. In an average bank, there are a few hundreds of applications running at the same time on this system to ensure these channels of delivery are effective and efficient. This has resulted in complexity in the system (Alamoudi & Kumar, 2017) and in complex systems there are bound to be issues, if not managed. Kreps (2014) noted that IS fails to achieve their purpose because of the problem with either the way they were designed or implemented and managed.

The factors attributed to these systems challenges could be far reaching and diverse. There are just too many reasons adduced to banking systems challenges that an exact characterisation of it is difficult - perhaps impossible to make (Benaroch & Chernobai, 2017). Review of literature shows IT solutions failure is multidimensional and has several sub-components: technical and non-technical. Researchers have defined failure as IT projects that have not met the time or financial budget constraints (Standish, 2014), or do not deliver the expected functionality (Dutta, 2016). Ewusi-Mensah (2003) described failure as the inability of implemented systems to operate according to proposed or agreed level. This includes not meeting the user expectations, or inability of creating working or a functioning system.

Over the years, Nigeria has had a good number of bank failures and by way of crisis resolution, banks merged and others acquired or were acquired. One of the challenges organisations face during the merger and acquisition processes is systems integration (Henningsson et al., 2018). Complexities associated with this integration result in system failures - this is the situation with many banking systems in Nigeria. Information systems or information technology integration

is a complex area to manage in merger and acquisition (Burke & Kovela, 2017). Another prominent reason why banking information systems are challenged is the use of and age of most banks' legacy systems. Most banks' legacy systems are old (Gardner, 2016) and were originally set up for branch banking but over time, the numbers of branches have multiplied. As such, the capacity of the systems is stretched and more so they have had to be bolted on to make them ATM-focused, then online banking, then mobile banking, etc. Every time you bolt on a change, it becomes more complex and more susceptible to failure.

There are however other attributable factors. These factors, among others, include low investment in the IT solutions due to limited financial resources (Avgerou, 2008). These technologies do not come cheap, they are expensive to acquire and maintain. Limited IT skill labour/personnel (Shaanika & Iyamu, 2014) to manage implementation and use is an attributable factor of the systems' challenges. Complexity of the employed IT systems (Georgescu & Jefleab, 2015) is challenging to manage and as such results in failure. Also, management approach factor (Johnston & Hale, 2009) also contribute to these systems challenges because they are responsible for the strategic decisions in respect of IT solution employment. Key too is the match or mismatch between IT designs and local user actuality; the use of IT systems developed in the developed countries and implemented in the developing countries. This poses a challenge to effective use, due to country context gaps (Heeks, 2006; Avgerou & Walsham, 2017).

1.6.3 Systems Evaluation

Organisations acquire and implement IT solutions with the belief that they will enhance their business processes and operations. It is of utmost importance to ascertain whether the IT solutions are adding value or benefits. The means or process to ascertain that value is added is by evaluation. According to Tadayon (2016), evaluation is a means by which the significance of a project is determined using some set criteria. This involves a critical examination of employed IT solutions to determine whether value and benefits are realised. Evaluation involves collecting and analysing of data in respect of IT solutions' activities, characteristics, and outcomes. Goldkuhl and Lagsten (2012) argue that evaluation is critical in that knowledge gained from both the process and outcome of the exercise. Evaluation is not an end in itself but for gathering of information which can be used by managers for strategic decisions to enhance and support IS implementation and use.

Without evaluation, organisations will only have an unsubstantiated notion that employed artefacts will be useful for meeting organisational objectives and goals (Venable et al., 2016). Many organisations do not realise early that their information systems are failing due to lack of or frequent evaluation. Hence, the purpose for which the IT solutions were acquired may not be realised. Visser et al. (2013) assert that evaluation has the purpose of achieving three things; to determine worth or merit; to improve the solutions; and to generate knowledge. Supportive knowledge gained from information extracted during evaluation activities can be used for improving the functionality of the artefacts and its alignment to organisations processes and operations. To strategically align IT solutions is one of the main purposes of systems evaluation as it is essential for attainment of goal and objectives of organisations.

There is a diverse range of ideas and proposals in existence as to how IT solutions evaluation should be approached. The ideas and proposals range from objective, rational and positivist ones to subjective and interpretivist (Dharni, 2014). Objective, rational and positivist evaluation approach make use of quantitative methods while the subjective and interpretivist approach is achieved by use of qualitative methods. A combination of both qualitative and quantitative evaluation methods (critical approach) are also used (Chen et al., 2011). Despite the array of methods and framework aimed at evaluating information systems and to ascertain value, performance issues and underlying factors, the IS failure rate remains stubbornly high (Dwivedi et al., 2015). Cronholm and Goldkuhl (2003) argue that many of the evaluation methods are inadequate and challenged because they lack strategies to be adopted in their application.

The Nigerian banking systems are challenged in implementation and use. They require a customised framework that can be used to evaluate their information systems. Unfortunately, new ideas on evaluation approaches have been relatively few in the last two decades and almost none in the last few years (Frisk et al., 2015). Though existing approaches are still valid and in use in IS evaluation studies (Karoulis et al., 2006), however they have not been applied in evaluation of the Nigerian banking information systems where culture and environment differ from where they have been applied. Culture and environment factors play an important role in information systems and information technologies (IS/IT) artefacts success or failure (Aldarbesti et al., 2015). To effectively evaluate the Nigerian banking information systems, a customised framework to guide its evaluation is required; one that takes into consideration its characteristics, culture and environment.

1.6.4 Actor Network Theory

Actor network theory (ANT) is a social technical theory employed in IS studies. The main attribute of the theory is its unique take, giving both human and non-human (technologies) equal status. ANT affirms that both contribute equally to the networks (Arif et al., 2017). The focus of the theory is on understanding the activities and relationship within social technical systems so as to use it to explain a phenomenon. This theory maintains that for any actor to act, others must act (Cresswell et al., 2010); meaning actions are inter-dependent and simultaneous. As such, to gain an understanding of a phenomenon, it is of essence to follow actors' steps by retracing paths followed and understanding their actions as this will reveal a brief view of the networks (Lourenco & Tomael, 2018).

To gain an understanding in IS studies ANT is employed. Researchers apply the actor-network theory (Elbanna, 2011) in information systems studies to understand actors' activities and relationship within networks. This is mainly because networks consist of both human and non-human (such as IT artefacts) actors. Iyamu and Sekgweleo (2013) argued that there exist a lot more non-technical complexities than technical in the development and implementation of IS solution in organisations. These complexity issues are socio-technical in nature, thus the need to employ a social technical theory to unpin IS studies. Information systems researchers need to understand that interaction between human, technology and information systems makes ANT suitable for IS studies (Alexander & Silvis, 2014). The intent of ANT is examining and theorising how networks were built, the associations which exist, how actors were enrolled and how networks achieve stability (Cresswell et al*.,* 2010). Application of ANT in Information systems studies assist in establishing and examining networks. It also helps examine relationship between actors in the networks i.e. technology to technology; technology to human; and human to human. ANT also aids to examine actors' roles in networks from human and non-human perspectives. An understanding of activities and relationship of actors and networks in information systems can be gained with the application of the actor-network theory (Gunawong & Gao, 2010).

However, to gain knowledge about the activities and relationship within networks there is a need to understand how networks are built or formed. Building networks start with recruitment of actors through the process known as translation. Translation was referred to by Elbanna (2011) as a process by which network builders recruit actors and ensure their faithful alliances. It is the process of creating connection between actors by aligning the interest of other actors with that of the focal actor (Sepehr & Reihaneh, 2011). The process is known as moment of

translation. There are four moments of translation and they are identified as problematisation, interessement, enrolment and mobilization (Iyamu & Sekgweleo, 2013).

The four moments of translation are discussed below. Problematisation is the process by which an actor positions or defines the problem to others (Govender & Chitanana, 2016). Interessement is the moment other actors are keyed into place by principal actors by interposing themselves (Heeks & Stanforth, 2015). Enrolment entails enlisting actors, and commitment by each actor is formally defined to make it part of shared memory of the social system (Twum-Darko & Harker, 2017). Lastly, Mobilisation is when actors are successfully mobilised to act according to their prescribed roles within the network (Jessen & Jessen, 2014).

The actor-network theory has been employed in IS studies to identify and examine given phenomenons, but it seems it has not been used in the context of the Nigerian banking information systems which are currently and frequently challenged.

1.7 Design and Methodology

This section covers the philosophical assumptions, research approach, research methods, research design, data collection and data analysis as they apply to this study, and how they will be employed towards achieving the objectives of the research.

1.7.1 Philosophical Assumptions

Information systems studies are based on some underlying philosophical assumptions. It guides researchers in the choice of approach to adopt in their studies (Chamberlain, 2015). These assumptions aid researchers in the choice of strategy and methodology for carrying out their studies. There are two main philosophical assumptions, ontology and epistemology, that are often followed in IS studies (Bryman, 2012).

Ontology is the study of things that comprise reality, the conditions of their existence and the relationships between these things (Rahi, 2017). It is the study of what is known, it looks at the nature of reality as seen through the lens of an individual (Saunders et al., 2012). Epistemology is the study of knowledge and is concerned with how knowledge is gained (Kivunja & Kuyini, 2017). Epistemology refers to how we know and the relationship between the knower and the known (Maxwell, 2012).

Based on the objectives of the study, both ontology and epistemology assumptions were followed as guides. This was because ontologically what is known was that IT solutions were employed by the Nigerian banking institutions to engage with their partners and provide services to their clients. From the epistemology front, what is not known was how the Nigerian banking institutions employed, used and managed IT solutions to provide services. In knowing what we do not know, subjective approach was required to examine the phenomena being studied. Thus, the interpretivist stance was followed.

Interpretivist focuses on exploring the complexity of social phenomena with a view to gaining understanding. The purpose of interpretivism is to understand and interpret everyday happenings (events), experiences and social structures – as well as the values attached to these phenomena (Rubin & Babbie, 2010).

1.7.2 Research Approach

To solve a problem, strategies on how to go about it need to be laid down, as this will establish a structured way of solving the problem. The plans and procedures used in research study which include the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation are known as research approaches (Creswell, 2014). It is the procedure involved in examining the phenomenon under study. The deductive and inductive research approaches are mainly employed in IS study (Saunders et al., 2016).

The deductive approach involves drawing conclusions in line with known or established fact or reasoning. The deductive approach is concerned with developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis (Williamson & Johanson, 2017). Thus, the approach is objective in nature and is often associated with quantitative methods.

Inductive approach involves drawing conclusion from observation i.e., one collects information and draws conclusions based on the information collected. it is a process where theory is developed by observation of empirical reality (Crowther & Lauesen, 2017). It generates meanings from data collected to identify patterns and relationships to build a theory. Inductive is based on learning from experience and it is qualitative in nature.

The research was undertaken using the inductive approach based on the aim of the study which was to develop a framework. This approach enabled the study to develop a framework

that can be generalised based on the findings from the data collected and analysed from the case study.

1.7.3 Research Methods

Research methods are tools used to do research. They are tools and techniques that are employed for making enquiries in research study (Walliman, 2017). They are fundamental to getting accurate data. The two types of research methods commonly used are qualitative and quantitative (Ben-Eliyahu, 2014) and when these two methods are combined, it is known as the mixed method (Creswell & Creswell, 2017).

Quantitative research method involves making enquiry using numbers and objective measurement. It is a systematic and empirical enquiry of a situation through use of statistics and mathematics and processing of numerical data (Basias & Pollalis, 2018). The methods utilise numbers and mathematical methods in collection and analysis of information in the research study.

The qualitative methods do not involve numbers. The qualitative research methods focus on exploring and understanding people's perceptions of different events, and it takes note of the people's perception in a natural setting (Gentles et al., 2015). The method is exploratory in nature and is mainly concerned with gaining insight and understanding on underlying reasons. This study seeks to understand how IS/IT is used and managed in delivery of services in Nigerian banks to explore and get the users' understanding and perceptions.

The mixed methods involve the adoption and combination of both quantitative and qualitative methods in research studies. This method involves the use of both or combination of qualitative and quantitative methods in the collection and analysis of data in a study (Creswell & Creswell, 2017). The qualitative methods were employed based on the subjective nature and objectives of the study. An understanding of factors challenging the Nigerian banking IS can be gained by investigating the perspectives and behaviour of the people in these situations and the context within which they act (Kaplan & Maxwell, 2005).

1.7.4 Research design

Research design helps with defining the environment within which the study is being carried out. Based on the aim of this research as stated in section 3.1 above, the case study method will be applied. "Case Study is an empirical inquiry that investigates a contemporary

phenomenon within its real-world contest" (Yin, 2014:16). Case study is most appropriate when there is a need to have an in-depth understanding of a phenomenon and which can be gained by investigating the situation in its real-life setting.

Based on the objective of the study, which was to examine and identify the factors affecting the use and implementation of IT solutions in Nigerian banks, the case study approach was adopted. Case study "explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information … and reports a case description and case themes" (Creswell, 2013: 97). A case study approach enabled the researcher to go to the banks where the phenomenon was happening and interact with the actors involved in the employment of these IT solutions for banking activities.

Two banks in Nigeria were selected and used as cases: a big bank and a relatively smaller bank. The choice of the banks was based on the following criteria: (1) The banks carry out banking operations in Nigeria, (2) the banks deploy information system and information technology solutions for provision of their products and services, and (3) the banks gave consent to be used as cases for the study.

1.7.5 Data Collection

Data collection is about gathering materials that are related to the phenomena being studied. The collected data are used to provide answers to the research questions. Data collection is a method used for collecting and measuring information from different sources to have a holistic and accurate facts above a phenomenon (Rouse, 2016). There are different techniques that can be used to collect data in IS studies and they include observation, questionnaire, and interview (Walliman, 2011).

Observation involves the researcher observing the real-life situation. Observation as research tool involves collection of data in real situation as it is taking place (Bacon-Shone, 2015). The advantage is that it captures what people are doing in the actual situation and based on the observation, questions can be asked.

Questionnaires are data collection tools which consist of written and standardised questions which are administered on respondents. The advantages include ease of administration and they can be used to get information from a large and diverse population (Pandey & Pandey,

2015). The problem however is that the questions are fixed and as such the respondents are limited in expressing their views.

Interviews are tools of data collection which involve the researchers having verbal conversations with participants to gather relevant data in respect of a phenomenon. Interviews are tools for accessing people's experiences and perception of reality; as it allows interviewees speak in their own voice and express their own thoughts and feeling (Berg, 2007:96). These interviews which can be structured, semi-structured or un-structured are useful in getting an understanding from participants' responses. The tool allows for an in-depth investigation around a topic and for follow-ups if need be.

Types of interview are as discussed. Structured interviews involve standardised questions which are read out exactly as they are on the schedule and in same order (Canals, 2017). The questions used in this type of interview are usually close-ended i.e., have only a "yes" or "no" answer and are mostly used in quantitative studies. Unstructured interviews do not have standardised questions or pre-determined questions and the questions are asked in no particular order. This type of interview takes too long and may lack precision (Alsaawi, 2014). Semi-structured interviews contain both elements of structured and un-structured interviews. This type of interview makes use of a guide with both open and close-ended questions, but during the interview the questions and sequence can be adjusted based on responses received from interviewees (Adhabi & Anozie, 2017). It provides reliable comparable qualitative data.

In this study, two sets, primary and secondary data were collected. The primary data was collected using semi-structured interview. This was based on the subjective nature of the study, which was to gather individuals and groups' views and opinions in respect of the phenomenon being studied. The semi-structured technique allows the researcher to have conversation with interviewees; explore meaning from responses; and re-adjust questions as the interview progresses (Adams, 2010).

The secondary data was gathered from existing documents that are related to the study. This includes documentations such as strategic documents, systems manuals and systems' user requirements. Bryman (2016) noted the term "document" covers heterogeneous sources of data which include personal documents, official documents, mass media output, and virtual output like internet resources. Atkinson and Coffrey (2011) refer to documents as distinct level

of reality, meaning that they are significant in accomplishing the purpose for which they are developed.

1.7.6 Data Analysis

Data analysis is the process and procedure employed in analysing collected data to provide explanation, understanding, or interpretation. De Vos et al. (2011:397) described 'data analysis as the process of bringing order, structure and meaning to the mass of data'. Analysis helps to gain meanings and understanding from data sets to answer research questions, thereby, achieving the objectives of the research. The analysis of the data is carried through various means, techniques and methods. In this study, the interpretivist approach was applied in the analysis of the data. This was mainly because the primary data was qualitative, which came from individuals and groups' subjective views and opinions.

In addition, or in complementarity, tools and theories are employed as guide or framework in some IS studies. Applying a theoretical lens in research study enables a deeper insight and analysis Sekgweleo et al. (2017) noted. There are however several appropriate theoretical frameworks that can be applied as a lens to guide data analysis. Among those used in IS study are Actor-Network Theory (ANT), Activity Theory (AT), Diffusion of innovation (DOI) and Structuration theory. Based on the objectives of the study, Actor- network theory was applied to guide the analysis of the data. ANT brief overview was given in section 4.4 above. Within the interpretivist approach, ANT was applied to guide the analysis as follows:

1. *To establish and examine the various networks that existed in the use and management of the banking systems. This includes how the networks were formed for the purposes of the systems' operations.*
2. *To examine the relationship between: technology-to-technology; technology-to-human; and human-to-human in their use of the systems to provide banking services to both clients and business partners. The relationship helped to extract the factors which influenced how systems are used and managed for banking purposes.*
3. *To examine the roles of the various actors, from both human and non-human perspectives, in the use and management of the systems. This helped to formulate criteria, towards the development of framework for systems' evaluation.*

1.8 Ethics

Ethics is a branch of philosophy that deals with the conduct of people and guides the norms or standards of behaviour of people and relationships with each other (Blumberg et al., 2005). Ethics in research are a set of principles about how researchers and research organisations should conduct themselves when dealing with research participants, other researchers and colleagues, the users of their research and society in general.

This study adhered to Cape Peninsula University of Technology (CPUT) research Code of Practice on Ethical Standards.

The research did not cause harm to any individual or group of individuals. As the study involved interaction with individuals or group of individuals; any confidential information that could cause harm to the participants or the organisation was kept as such.

Also, each participant was made aware that they were free to withdraw from the process at any given time. This meant that participation was voluntary. This was in adherence to research code of conduct, in compliance with the university (CPUT) policy.

In addition, the data from the cases were kept confidential to the researcher and his supervisor only. This was to protect the identity of both the organisations and the individual participants.

1.9 Delineation and Timeline Budget

This section addresses study delineation, timeline and budget.

1.9.1 Delineation of the Research

The study was limited to the Nigerian banking sector and two banks in Nigeria were used as the case study.

1.9.2 Timeline

STEPS	DATES
1. Submission of proposal 2. Proposal presentation	November 2018
Chapter One: Introduction and Background **Chapter Two:** Review of Literature	November 2018 – March 2019
Chapter Three: Research Methodology	April - July 2019
Fieldwork: Data gathering and sorting	August - December 2019

STEPS	DATES
Chapter Four: Case Study Overview **Chapter Five:** Data Analysis (case 1 and 2)	January 2020 - February 2020 March 2020 – August 2020
Chapter Seven: Summary and Conclusion	September – November 2020
Compilation of all chapters with necessary corrections. Submission of First draft.	November 2020
Necessary corrections, proofreading, editing and submission of the final draft of thesis	November 2020

1.10 Outcome, Contribution and Significance of Study.

This section addresses the study outcome, contribution and significance.

1.10.1 Outcome

The expected outcome of the study was the achievement of the aim and objective of the study; which included the development of a customized framework that can be used to guide the evaluation of the IT solutions used by banking institutions in Nigeria. The expected outcome also included the study providing a guide for examining and identifying factors that affect the implementation and use of IT solutions in banks.

1.10.2 Contribution of the study

The contribution of the study came from three different perspectives: theoretically, practically and methodologically. Theoretically, the research contributed from the framework that was developed. The framework developed, based on empirical findings/results can be used to enhance and support existing theories in IS studies especially in developing countries in similar situation with Nigeria. In addition, the thesis added to the existing literature in the areas of IS, banking information systems and ANT, particularly from the perspectives of Nigeria and developing countries where there exists very little literature about the phenomena being studied.

Practically, banking institutions in Nigeria and other developing countries with similar challenges can use it to understand the actual factors that influence use and evaluation of their IT solutions. Thus, evaluation and use of IT solutions by banking institutions can improve, which can manifest in the improvement of effective and efficient services that they provide to their customers and partners.

Methodologically, the use of ANT to guide the development of an IS/IT solution framework for banking institutions in a developing country is a major contribution to both the practitioners and academics.

1.10.3 Significance of the study

The significance of the study is that it will enhance the support and enablement of IT solutions of banking institutions in Nigeria. This study also seeks to lay a foundation and reference for future studies concerning evaluation of IT solutions use for banking activities in Nigeria and ultimately contribute to the body of knowledge by adding to existing literature.

1.11 Conclusion

The topic is “a framework for evaluation of the Nigerian banking information systems”. The research problem was stated clearly in order to guide the aim and objectives. The review of literature covered the related areas of the study. This revealed the gaps that existed in this area of studies and related fields; and this has brought this study into context. In the research methodology, the methods, approaches and techniques were carefully selected to ensure appropriateness, towards achieving the aim and objectives of the research. The ethics showed the code of conduct adhered to in carrying out the research; this acted as guide for the conduct of the researcher and promoted the aim of the study. The significance of the study showed the impact the study will make i.e., the rationale for the study. The contribution of the study showed what the research contributed theoretically, methodologically and practically.

Chapter 2
Literature Review

2.1 Introduction

This Chapter presents the review of literature based on the aim of the study, which was to propose a solution that can be used in addressing the challenges confronting banking institutions in Nigeria, in the use of information systems and information technologies (IS/IT) solutions The main areas of focus in the review of literature are: (1) how and why IS/IT solutions are applied by the banking sector, with specific focus on developing countries; (2) the roles of IS/IT in enabling and supporting the processes and activities of banking services; and (3) the significance of evaluating IS/IT solutions within banking institutions. Also, review was conducted on actor-network theory (ANT); the theory that was used to underpin the study. The review of literature helped to bring this study into context; revealing the current state of things and the challenges that exist.

The chapter is divided into nine main sections. The first section introduces the chapter. The following three sections cover information systems and information technologies, information systems and information technology for banking services, and banking services in Nigeria, respectively. System evaluation is presented in the fifth and sixth sections. The underpinning theory is discussed in the seventh section. The use of actor-network theory in IS research in the context of this study is covered in section eight, which is followed by the conclusion.

2.2 Information Systems and Information Technologies

Over the years, information systems and information technologies (IS/IT) have gradually become an integral part of the society's daily life including banking institutions (Gbadegeshin et al., 2019). According to Madonsela et al. (2013), IS/IT consists of a wide array of technologies, systems, devices, and services used for data processing; systems' interaction; and telecommunications transmission and communication. The array of technologies engaged by banks and other organisations to achieve their business objectives include artefacts such as hardware, software, network, process, as well as people (Ekwonwune et al., 2016). Examples of the technology artefacts that are engaged in facilitating information and communication activities in organisations include desktops and laptops; personal computers (PC); the internet; computer software; applications; technology equipment; mobile and

communication technology (connections) and personnel who use and manage these artefacts (Baporikar, 2016).

The potentials of IS/IT artefacts are reflected in the way many banks, particularly those in the developing countries, are engaging them. As in many organisations, the need to remain productive, profitable, and competitive drive the adoption and use of IS/IT solutions by banking institutions (Van de Wetering & Mikalef, 2017). Some banks adopt technologies purposely to enhance effectiveness and efficiency of events, processes and activities. One of the critical areas of operations where such organisations as banking institutions are engaging IS/IT solutions for use is in their decision-making processes which is critical for resource allocation (Alduraywish et al., 2017). According to Lobaziewicz (2016), IS/IT solutions can be used to facilitate the gathering, processing, and sharing of quality information between individuals and organisations for various purposes, including decision making. This is critical because quality information can help organisations improve in their pursuit of competitiveness and sustainability, including satisfaction of customers (Zheng et al., 2017). Price and Shanks (2016) assert that quality information and information quality management in an organisation is of essence for effective operations and decision-making.

Increasingly, IS/IT solutions are used for innovation of business processes and activities; to develop new products and services; and to effect new modes of business (Gatautis et al., 2015). In many retail businesses, the adoption and use of IS/IT solutions is enabling them to engage in e-commerce. According to Hanell et al. (2019), e-commerce is creating opportunities for many resource-constrained retails SMEs to widen their markets locally and internationally. Dwivedi et al. (2017) suggest innovation has become critical to finding solutions to problems, increasing quality and profitability. Yu, Cheng and Qiang (2016) argue that business innovation can help organisations to enhance value propositions; capture new markets and alienate competitors.

The adoption of IS/IT solutions also avails many organisations such as the banking institutions and other service-based businesses the opportunities to improve the quality of their services and products delivery. According to De Waal and van der Heijden (2016), quality services are those services that are prompt, accurate, reliable and complete; and which are performed right the first time with value added to the customers. Quality of service is essential for business sustainability and competitiveness (Trigo et al., 2015). These IS/IT solutions also give many organisations opportunities to automate their processes. Odawa et al. (2014) argue that

automation of organisations' processes and operations can lead to better services and products delivery.

The term ICT refers to devices and tools that enable generating, gathering, processing, storage, retrieval, communication and delivery of information (Kumar & Ramesh, 2015). Gbadegeshin et al. (2019) suggest that IS/IT artefacts enable communication, which enhances effectiveness of interaction in some areas. Effective communication can help businesses expand, create relationships, strengthen organisational effectiveness and allow people to learn from each other (Jain & Yadav, 2017). Markovic and Salamzadeh (2018) argue that many business organisations are using IS/IT artefacts to enable effective communication with employees, customers and business partners.

The significance of IS/IT artefacts are quite evident from the way they are shaping businesses' outcomes (Govender & Pretorius, 2015). Some IS/IT artefacts have become the basis of economic growth and a driving force for social changes in the 21st century (Kumar & Maheshwary, 2015). According to Muawanah and Gunadi (2018), one of the main benefactors of these technologies are the banking institutions. The banking institutions' role as a facilitator of economic activities in any economy makes it imperative for them to deliver quality services. The quality of the services they provide to their customers is critical for the economic development of a country (Zalewska-Kurek, 2016).

Even though the IS/IT solutions bring many benefits, there is still a high percentage of information systems and communication technology projects that fail to achieve their aims and objectives, especially in developing countries (Ebad, 2018). Many banks in Nigeria have been seriously challenged with the adoption and use of IS/IT solutions for their service delivery (Ekuobase & Olutayo, 2016). Dwivedi et al. (2015) argue that the reasons many IS/IT solutions employed by organisations failed to meet expectations are complex and multi-factorial.

The challenging factors are both technical and non-technical, from business and IT units' perspectives (Hussain et al., 2017). On the technical front, the challenges include factors such as low systems availability, low performance, lack of infrastructure and security challenges (Triche & Walden, 2018; Cram et al., 2017). From the non-technical viewpoint, the factors include failure in processes, misalignment of strategies, cultural differences, lack of skilled IT personnel, management challenges and knowledge gap (Almalki et al., 2017; Heeks, 2002). Shaanika and Iyamu (2015) suggest that addressing the technical and non-technical factors in the implementation and use of IS/IT solution can help organisations achieve their IS/IT

objectives. This is a challenge that many banking institutions in Nigeria, and some other developing countries, have not been able to address (Udo et al., 2017).

2.3 Information technology Solutions for banking services

Information technology (IT) solutions comprise hardware, software and communication infrastructure such as computers, mobile and wireless communication devices, networks, website (2.0), internet and people (Gbadegeshin et al., 2019). Reynolds and Stair (2016) assert that these integrated set of tools enable the collection, storage, and processing of data; needed for providing information; knowledge; and digital products and services. According to Niranjan et al. (2018), these technologies have become critical tools in the banking industry for achieving business goals and objectives.

Within the banking industry, information plays a vital role as it is required for the processes and operations involved in service delivery (Liberti & Petersen, 2018). To enable the collection, processing, distribution and storage of data to obtain organised flow of information, banking institutions adopt and use IS/IT solutions (Bruno et al., 2016). Moslehi et al. (2018) suggest that these banking solutions can enable banking institutions to gather substantial volumes of data of millions of customers with unprecedented accuracy and at low cost. Viardot (2017) argues that organised information is important in service production for delivery to banking customers.

The ability of IS/IT artefacts to enable the networking of diverse systems drives its adoption for business activities (Al-Mamary et al., 2014). Wang et al. (2019) refer to networking as the collection of autonomous computers and people that are interconnected and shared for the purpose of resources sharing. Lawal et al. (2018) assert that banking institutions are adopting and using these artefacts to network their branches and electronic channels. This is enabling the banking institutions to efficiently distribute data and information required for enabling and propelling banking services over the banks' networks (Georgescu & Jeflea, 2015).

Products and process innovation can help the banking institutions to provide strategic services that are tailored to the unique requirements of their customers (Obeng & Mkhize, 2017). According to Siqueira et al. (2019), IS/IT solutions can be used to facilitate the production of unique service and products. Nkiru et al. (2018) assert that these solutions also avail the banks the opportunity to automate their processes, controls, and information production, using computers. Giri and Shakya (2018) assert that the automation of processes can give the banks

the opportunities to provide varieties of services and information needed at present time to meet their customers' specific business requirements. With the use of IS/IT solutions, banking institutions can deliver online real-time services to their customers (Boumlik & Bahaj, 2018).

To remain relevant and have competitive advantage, banking institutions engage the services of the IS/IT solutions in enabling and supporting their goals and objectives. According to Sapkota et al. (2018), this is being reflected in the use of these banking technology solutions by the banks to open their services and products beyond the local markets. This avails many locals in the Diaspora the opportunity to have relationships with their local banking institutions while at the same time aiding the expansion of their market for competitive advantage. Ekwonwune et al. (2016) affirm that the use of IS/IT solutions can enable banking institutions to develop new markets; new services and products.

The capabilities of IS/IT artefacts give the banking institutions the opportunity to create platforms for providing financial services to many financially excluded people. Otaokpukpu et al. (2019) refer to the financially excluded as the poor section of people living in the rural and urban areas like the small-scale farmers, small vendors, agricultural and industry labourers. Lapukeni (2015) suggests that IS/IT solutions have the capacity to provide services to a large number of financially excluded persons. David-West et al. (2018) argue that a promising means of providing financial services to the financially excluded people profitably and at scale is through digital payment platforms enabled by ICT. Kanobe et al. (2017) assert that with the adoption and use of IS/IT solutions, many financially excluded persons can be enabled to carry out banking activities.

The benefits of engaging the services of IS/IT solutions for banking activities are enormous. These solutions have become a critical component for creating value in the banking industry (Bruno et al., 2016). The banking institutions use the solutions to create sophisticated products, better market infrastructure, techniques to control risk and expand services to geographically distant and diverse markets (Thakur, 2018). Sargolzaie, et al. (2015) assert that the advancement in IS/IT can be used to improve relationship management and provide broad and diverse services at reduced transaction costs.

Though the adoption and use of information systems and information technology bring many advantages to the banking industry, the effectiveness of these solutions continues to be challenged. According to Amin et al. (2018), the adoption of IS/IT solutions for banking activities has yet to have a significant effect on customers' satisfaction. The authors argue that

evidence abound on the daily challenges that the customers face in the use of many banking channels due to the persistent failure of these technologies. Mkpojiogu and Asuquo (2018) suggest that the factors that affect the effectiveness of these banking solutions are technological and process related. Some of the technological factors include persistent network failure, low availability, low performance, and security breaches in these solutions (Tipi et al., 2017; Pejovic, 2016; Hussain et al., 2017). The process factors include misalignment of ICT strategies, lack of users' capabilities to identify the right technology, lack of policy support, lack of required skills, and management approach (Shaanika & Iyamu, 2014; Ochara et al., 2014; Quaglio et al., 2016; Dwivedi et al., 2013). Benaroch and Chernobai (2017) argue that IS/IT solutions' consistent failure can affect organisations' ability to deliver products and services, and to connect with their customers.

2.4 Banking services in Nigeria

In Nigeria, there are twenty-two commercial banking institutions providing banking services (Central Bank of Nigeria, 2018). Ibitoye and Ajayi (2001) refer to banking services as the activities that are concerned with the mobilisation of deposit, granting loans and advances, transfer of funds, money creation and other financial transactions. According to Klimontowicz and Derwisz (2016), in today's economy, money has become the basis for goods creation, gathering, division, and exchange. To effectively deliver banking services to customers and business partners, the banking institutions in Nigeria adopt and use information systems and information technology (IS/IT) solutions. Saravani et al. (2015) define electronic banking services as the use of technology tools, platforms and channels to provide services to customers.

Some examples of the electronic channels used for banking activities include laptops, desktop computers, smart phones, tablets, personal digital assistants, ATM, POS, and electronic bank cards (Martin et al., 2018). These electronic channels are enabled, using the internet and advancement in communication technology (Mahajan & Ranade, 2019). Adeniji and Akinbode (2018) assert that these electronic channels give some customers in Nigeria the opportunity to carry out banking activities such as the opening of accounts, checking of account details, transfer of funds, payment of bills, access to information real time and interaction with their bankers.

Some of the electronic banking services provided by the banking institutions in Nigeria to customers include internet banking services, mobile banking, point of sales, SMS alert, ATM

services, banking cards, USSD, online real time services and periodic electronic statements of account (Ikpefan et al., 2018). Harriet et al. (2017) refer to electronic banking as the use of the internet as a device to control a machine or apparatus from a distance through an electronic network to provide services. Ololade and Ogbeide (2017) assert that internet banking service allows customers in Nigeria to monitor their financial transactions; transfer funds, pay bills, make requests and access timely and reliable information required for effective planning and strategic decision.

Mobile banking service is an electronic service provided by the Nigerian banking institutions, that allows the customers conduct a range of financial transactions through the use of their mobile devices and software commonly called an app (Vahedi et al., 2016). According to Karim et al. (2018), mobile banking service is a real-time online banking service that avails the customers' opportunities to carry out banking activities at all times and everywhere throughout the country. Kalaiarasi et al. (2017) assert that the mobile banking service is cost effective, convenient and time saving. Khan and Ejike (2017) argue that mobile banking service also enables many persons in Nigeria hitherto unbanked to have access to banking facilities through their mobile phones.

The Automated teller machine (ATM) service is a form of electronic service that allows customers to carry out banking activities via electronic teller outlets (Lee et al., 2018). According to Jegede (2014), ATM is a computerised telecommunication device that allows customers carry out banking transactions without interaction with bank officials. Saha and Rahman (2018) assert that ATM can facilitate cash withdrawal, balance enquiry, transfers and other financial services. Within Nigeria, ATM services enable customers to carry out their banking activities at their convenience, saving them travel time and cost (Ali & Emenike, 2016).

To have competitive advantage, the banking institutions in Nigeria are deploying electronic channel services which also include point of sales terminals (Enoruwa et al., 2019). Akintunde (2016) asserts that the POS service allows businesses to get immediate value for their sales, track their financial transactions, reduce cash handling expenses, track stock inventory and increase sales. Acha et al. (2017) suggests that point of sales service has reduced the risk associated with carrying cash and delayed payments. Ibanichuka and Oko (2019) argue that this electronic banking service gives some customers the opportunity to buy and sell goods without the use of cash.

Electronic banking services are also enabling the customers to easily access timely, fast, accurate and reliable information needed for strategic decision making (Liebana-Cabanillas et al., 2016). Nkiru et al. (2018) assert that electronic services provided by the banking institutions in Nigeria help the customers to reduce their cost of business activities, increase productivity and profitability. Ilo et al. (2014) suggest that electronic banking service gives the banking institutions the opportunity to address challenges associated with the conventional modes of service delivery. Some of the challenges include slow and inefficient processes, crowded banking offices, financial exclusion, long financial settlement periods, large cash-based transactions and associated risks (Burodo et al., 2019; Ajah, 2016; AlWreikat et al., 2019).

Despite the advantages electronic banking services have brought, effective service delivery by the Nigerian banking institutions continue to be challenged (Amin et al., 2018). Asiyanbi and Ishola (2018) note that consistent electronic transactions' failure continues to be a challenge to quality banking services delivery in Nigeria. Ehijiele et al. (2018) suggest that electronic banking services have brought new challenges to banking services delivery. According to Isibor et al. (2018), the poor services exist because the IS/IT solutions used in service delivery are challenged by issues which include faulty systems and poor internet (inter)connectivity. Babatunde and Ishola (2018) argue that other factors that challenge the quality of electronic banking services include security issues and persistent failure of electronic transactions processes.

In Nigeria, irregular power supply and unreliable communication (connectivity) are factors that challenge the delivery of quality banking services (Kida & Goyal, 2018). According to Stratemeyer et al. (2014), core service failures can be very problematic if not addressed. Sharma et al. (2016) assert that banking services' persistent failure can have a negative effect on the customers and businesses. These challenges affecting the effectiveness of banking IT solutions in Nigeria need to be addressed.

2.5 Information Systems Evaluation model

Evaluation plays a critical role in an organisation's effort to assess the success of IS investments (Song & Letch, 2012). This is because effective evaluation of the information systems implemented can help an organisation to ascertain if value is realised from IS investments. Benedict (2016) refers to evaluation as an exercise involving the systematic and objective examination of a project; concerning its relevance, effectiveness, efficiency and impact. As such, evaluation is required to help determine the effectiveness and success of

IS/IT projects (Ceric, 2015). Zhang (2015) argues that evaluation can be used to assess information systems' performance, value or success.

Given the high failure rate in IS projects (Bronte-Stewart, 2015), it has become important to identify and examine the factors that can contribute to the success or failure of IS investments. Identifying and addressing these factors may help organisations realise better value and successes of implementing information systems. Song and Letch (2012) assert that evaluation can be used to identify, measure and assess the value of an object in each context. However, to effectively identify, measure and assess IS value remains a challenge for IS researchers and professionals (Meyer et al., 2015). In response to the need to appropriately evaluate and determine the success of IS/IT artefacts implemented, various literatures have introduced various evaluation models (Chaysin et al., 2016). Nguyen et al. (2015) refer to "IS success model as a theory that seeks to provide an understanding of IS success by identifying, describing and explaining the relationships among the most critical dimensions of success along which IS can be commonly evaluated".

Some of the models that have been developed and used to measure the success of information systems include the DeLone and McLean Success model (1992; 2003); Enterprise systems success (Gable et al., 2003); Task-Technology Fit (TTF) model (Goodhue & Thompson, 1995); the Model of User Satisfaction (Bailey & Pearson, 1983); the End-user Computing Satisfaction model (Doll & Torkzadeh, 1988); re-specification and extension of the DeLone and McLean model of IS success (Seddon, 1997); IS effectiveness matrix (Seddon et al., 1999); and Technology acceptance model (Davis, 1986).

One of the most employed in IS study is the DeLone and McLean information systems success model. The model was developed in 1992 and modified ten years later. The IS model was developed as a framework and model to guide IS employers on measuring the effectiveness and success of information systems investments (Delone & Mclean, 2016). The earlier model (1992) was developed based on theoretical and empirical IS research of information systems management conducted by several researchers between 1981 and 1987. In the formulation of the model, the authors relied on the earlier works of Shannon and Weaver (1949); the mathematical theory of communications, and Mason's information influence theory (1978).

The model by Delone and Mclean (1992) identified six dimensions or taxonomy of IS success as systems quality, information quality, use, user satisfaction, individual impact and organisational impact. The authors reasoned that to measure IS success, researchers need

to focus on the desired characteristics of the IS artefacts itself. This is presented as system quality and which they proposed, can be measured from perspectives such as ease-of-use, functionality, reliability, flexibility and data quality (Gable et al., 2008; Iivari, 2005; Sedera & Gable, 2004). The next is Information quality, which can be measured from perspectives such as information accuracy, timeliness, completeness, relevance, and consistency (Iivari, 2005; Gable et al., 2008). The authors argue further that the quality of information can have effect on the use and user satisfaction.

The use and user satisfaction measurement can be accessed through frequency of use, time of use, number of accesses, usage pattern, and dependency (Almutairi & Subramanian, 2005; Iivari, 2005). At the influence level, the authors believe that the effect which the information produced has on management decisions can influence individual impact. They assert that individual impact can be measured from the angle of the quality of the work environment, decision making, and job performance (Gable et al., 2008; Sedera & Gable, 2004). The information product's effect on organisational performance can be measured through organisational impact, such as the achievement of goals and objectives (Almutairi & Subramanian, 2005; Sabherwal, 1999).

In 2003, due to changes in the role of Information systems and progress made in IS field since the 1980s on which their initial study was based; the model was reviewed and updated (Delone & Mclean, 2003). The modified dimensions of the model became system quality, information quality, service quality, intention to use/use, user satisfaction, and net benefits. The following success dimensions were added: (1) Service quality, which can be measured through tangibility, reliability, responsiveness, assurance and empathy (Pitt et al., 1995; Chang & King, 2005); (2) Intention to use, which precedes use, was introduced; and (3) Net benefits replaced individual and organisational impact; this includes benefits accruing from the implementation and use of IS which may include financial outcomes, efficiency outcomes, and customer relationship outcomes (Almutairi & Subramanian, 2005; Gable et al., 2008; Sedera & Gable, 2004).

Though the DeLone and McLean model (1992; 2003) has been tested and some aspects of the model validated by some authors (Seddon 1997; Seddon & Kiew, 1994; Rai et al., 2002; Iivari, 2005; Kulkarni et al., 2007; Petter et al., 2013), it has however been appraised as being a casual/process model and not a success measurement model (Gable et al., 2003). Mardiana et al. (2018) suggest that the model may not be useable in all practical situations. The authors

argue that the model tends to explain and predict factors that contribute to IS success more than being a success measurement model. Delone and Mclean (2003) in response assert that these dimensions of IS success are interdependent variables and as such have important implications for the measurement, analysis and reporting of IS success in empirical studies. However, the model has been tested empirically to assess implemented information systems (Seddon & Kiew, 1994; Rai et al.,2002). Some researchers have also used it to assess aspects of banking information systems in some developing countries with a similar banking environment with Nigeria (Jaafreh, 2017; Budiwati & Kurniasih, 2014; Balasubramanian et al., 2014).

2.6 Information systems and information technology evaluation

Evaluation of implemented IS/IT solutions has become a necessity for the organisations engaging their services to enhance and support business processes (Mashabela & Pillay, 2017). This is because evaluation can help to determine whether benefits are accruing from the implementation and use of these solutions (Gomes & Romao, 2015). According to Venable et al. (2016), without evaluation, organisations will only have an unsubstantiated notion that artefacts adopted will be useful for meeting their goals and objectives. Ababneh et al. (2017) argue that evaluation can also be useful in determining the value accruing from the adoption of IS/IT artefacts.

Evaluation activities can be used to generate information which can enhance the effectiveness of IS/IT solutions (Irani, 2008). According to Nikpay et al. (2016), information is critical for enhancement of decision making in respect of the management of IS/IT artefacts. The information generated from evaluation can help to gain a better understanding of the IS/IT artefacts. Ceric (2015) suggests that an understanding of how IS/IT artefacts are adopted can contribute to the solutions' performance in a given organisation's context. Cronholm and Gobel (2016) argue that this understanding can help in the better management of these artefacts. Ahmadian et al. (2015) affirm that evaluation is an important aspect of IS/IT development and implementation activity that can reveal the strengths and weaknesses of systems.

Efforts to effectively evaluate IS/IT solutions have resulted in the development of a wide array of evaluation methods. The evaluation methods in existence range from objective, rational and positivist ones to subjective and interpretive ones (Dharni, 2014). All aim to address the different aspects of IS/IT solutions use. Despite the wide array of evaluation methods, appropriate evaluation remains a tough task. According to Saleem et al. (2016), evaluation is

not an easy task, given the different aspects of the artefacts that need to be considered during evaluation. Berghout and Remenyi (2005) assert that evaluation is a multidisciplinary topic that is complex and has a variety of approaches. Gable et al. (2003) affirm that there are just too many angles from which IS/IT artefacts can be evaluated.

The reasons why the effective evaluation of information systems employed by organisations is challenged are suggested in some literature. According to Frisk et al. (2015), existing evaluation methods lack appropriate guidelines or strategies. As such, the application of these evaluation models in practice continue to be challenging. Venable et al. (2016) suggest that the absence of appropriate evaluation guidelines may be the reason for the development of the wide array of evaluation approaches and methodologies in existence. This is because each researcher is developing evaluation models or strategies from their own perspectives. Goldkuhl and Lagsten (2012) argue that many of the evaluation strategies in existence were developed by authors that do not have interest in the evaluation of empirical phenomenons. As such, organisations continue to be challenged in effectively evaluating information systems.

To address this situation, Cronholm and Gobel (2016) suggest that the development of an appropriate evaluation framework can provide a structure that can be utilised to connect appropriate evaluation methods. The authors suggest that the IT managers and researchers with interest in empirical phenomenon need to take up the challenge of developing a customised framework to guide IS/IT evaluation; one that will take into consideration the peculiarity of the content and context of the implemented IS/IT solutions. Cronholm and Gobel (2016) suggest that the continued use of generic evaluation approaches and methodologies that do not take into consideration the content and context of IS/IT solutions may be challenging. Stockdale and Standing (2006) argue that the lack of an evaluation framework that reflects social, political and cultural factors can influence project development. Aldarbesti et al. (2015) assert that culture and environment factors also play an important role in the success or failure of IS/IT artefacts.

2.7 Underpinning Theory

The actor-network theory (ANT) is used to underpin the study. This means that the theory is used as a lens to guide the analysis of the data and the interpretation of the findings toward achieving the aim and objectives of the study, which are stated in chapter 1 and revisited in chapter 3. This is the basis on which this review was conducted. The focus of the review is on moments of translation and black box. This section is divided into three parts: first, it provides

a general characterisation of the ANT. In the second and third parts, it discusses the moments of translation and black box, respectively.

2.7.1 Actor-Network Theory

The primary tenets of the ANT are actor and network. In ANT, an actor is both human and non-human (Callon, 1986), and network consists of actors (Latour, 1986; Callon, 1991). This means that neither actors nor networks operate in a vacuum (Chitanana & Govender, 2018). Also, this means that ANT does not distinguish between human and non-human actors (Bencherki, 2017). A critical aspect of the theory is its view of the society as a network of entities (human and non-human) that interact and negotiate to pursue an agreed goal. According to Iyamu and Sekgweleo (2013), both human and non-human actors work together to deliver information systems as requested by the organisation.

The theory helps to gain insights into actors' activities, interactions and negotiations within a network; which provides an understanding of a technology-driven change (Lourenco & Tomael, 2018). The moments of translation from ANT's perspective is employed to focus on how human actors carry out negotiation in the use of IT solutions for banking services. The black-box, also from ANT's perceptive, is used to gain an insight into the hidden complexity as events and processes were carried out in a repertoire manner, for banking purposes.

The theory was designed specifically to describe and analyse those conflicts in which human and non-human elements are involved (Callon, 1999). The theory asserts that human and non-human actors are equally engaged in and responsible for reassembling the social system (Cecez-Kecmanovic et al., 2014). As such, within ANT, both human and non-human actors are to be seen and treated as equal entities. The theory decentres the human actors but rather considers heterogeneous actors. Elder-Vass (2019) argues that although ANT is neither a research method nor methodology, yet it does have an implication on how social research should be approached.

The smooth and seamless operation of a system is not a natural state of fact but rather an outcome of complex interactions and negotiations between the actors (Bencherki, 2017). This means that the unseen interactions and activities of both human and non-human actors in a social system are responsible for the seen activities. Cresswell et al. (2010) assert that the actions that happen within the networks are shared responsibility; as actors can only act in combination with other actors and in groups to achieve a goal. The theory maintains that no

actor has inherent power; as power is only generated through the costly and risky work of translation (Latour, 1986). In ANT, power is performance and not a possession (Arif et al., 2017). As such, the outcome and durability of a network is derived from the durability of the alliances it creates.

The theory maintains that actors must come together to form alliances that result in the establishment of a network. The building of the network involves the recruitment of human and non-human actors. ANT argues that if the process of building the actor-network is retraced, an understanding of a phenomenon can be gained. Lourenco and Tomael (2018) suggest that retracing actors' steps can reveal a brief view of the networks. To get a better understanding of the activities, interaction, and negotiation within the information systems network employed by the Nigerian banking institutions, it is essential to retrace the steps taken in the creation of the networks.

2.7.2 Moments of translation

In ANT, translation is the process by which network builders recruit actors and ensure their alliances of faithfulness (Elbanna, 2011). It is the stage where connections are created between actors by aligning the interest of other actors with that of the focal actor within a network (Sepehr & Reihaneh, 2011). According to Pascoa and Tribolet (2014), translation is the process that leads to the creation of an actor-network. Latour (1987) asserts that translation encompasses the mobilisation of human and non-human elements in different directions and the result of which is a slow movement from one place to another. This is the point that relationship is formed, and common interest agreed upon.

Translation comprises four moments as shown in Figure 2.1. These moments are problematisation, Interessement, enrolment and mobilisation (Johnson & Iyamu, 2019). According to Nehemia-Maletzky et al. (2018), moments of translation is a process where an activity transforms or is given a meaning. Govender and Chitanana (2016) refer to problematisation as a process by which an actor positions or defines the problem to others. At this moment, an actor positions the project as an indispensable one to the other actors. This focal actor makes itself indispensable in the network as it defines the problem and motivates others to accept the objective of the network (Gunawong & Gao, 2010).

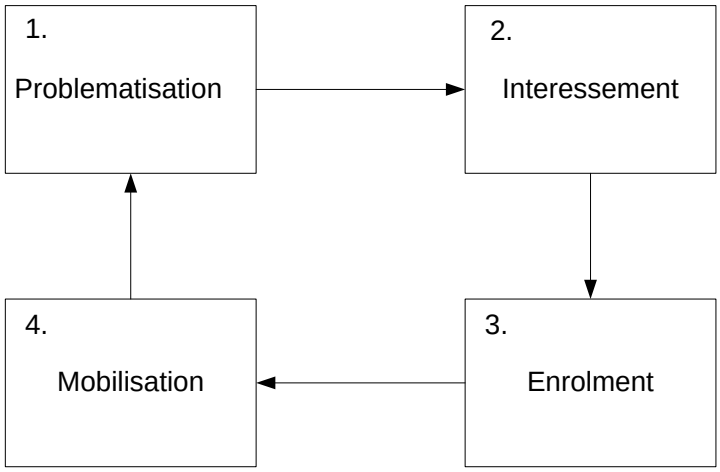

Figure 2.1: Moments of Translation (Callon, 1986)

Problematisation is achieved when the focal actor sets the project as the obligatory passage point for other actors to go through if they want to pursue their own interest. Obligatory passage point is reached when all the actors are convinced by the focal actor that the alliance can satisfy their interest (Zawawi, 2018). At that point, actors render themselves indispensable to the network (Iyamu et al., 2014).

Interessement is the moment where other actors are keyed into place by principal actors by interposing themselves (Heeks & Stanforth, 2015) – interposing in the sense that the focal actor comes between two entities, thereby cutting the link or weakening the link between them in their original network. This action locks the entities into the new network. According to Gunawong and Gao (2010), Interessement is a series of processes where an actor locks other actors into positions that they have been offered. Harry et al. (2014) argue that Interessement is basically a strategy aimed at making the actors to accept the identity and role that have been imposed on them by the focal actor. However, not all actors will adhere to the same Interessement strategies; others may have diversified interests.

Enrolment entails enlisting actors, and commitment by each actor is formally defined to make it part of shared memory of the social system (Twum-Darko & Harker, 2017). At this stage, the actors accept the role imposed on them and they begin to align their interest with that of the focal actor. However, the success of the process of enrolment depends on the ability of the focal actor to convince the other actors to accept to be part of the network. According to Latour (1987), this is achieved through a series of strategies and negotiations.

Lastly, Mobilisation is when actors are successfully mobilised to act in accordance with their prescribed roles within the network (Jessen & Jessen, 2014). At this stage, the focal actors borrow the force of the passive actors and turn themselves into their representatives or spokespersons. According to Nehemia-Maletzky et al. (2018), this stage represents the successful establishment of an actor-network with aligned interest.

When the network created is stable, intermediaries are required to describe the network in a material form (Callon, 1991). This process is known as inscription. Paledi and Alexander (2017) refer to inscription as a process where actors inscribe their ideas, knowledge, belief and values in order to protect their interests. Zawawi (2018) asserts that inscriptions are used to define roles and describe the inter-relationships in networks. Inscriptions are represented in the form of texts, discussion, graph, technical objects and other elements (Latour, 1999).

A successful translation can lead to the creation of a powerful enough network of actors to carry a technology through (Vidgen, 1997). However, when the expected technology change fails to accomplish its purpose, this can be considered a reflection of the inability of actors to build a strong alliance among the other actors.

2.8 Actor-Network Theory and Information system study

As a sociotechnical theory, ANT asserts that outcomes are results of joint activities of human and non-human actors that make up assemblages (Elder-vass, 2019). The theory also maintains that human and non-human elements are equally accountable for the outcome of a social system and as such should be treated equally (Costa & Cuhna, 2015). The theory further argues that an insight into the activities and relationships that exist in the assemblages can be used to explain the outcome of the assemblages. Alexander and Silvis (2014) assert that these principles are what make ANT suitable for IS study.

The theory has been applied in many IS studies to identify, explain, understand, and resolve the complexity in information systems. Shrafat et al. (2016) applied ANT in the study of information systems investments evaluation. The study was carried out to better understand the often far-reaching implications associated with technology investments and interrelated IS evaluation. Twum-Darko and Harker (2017) applied the theory in their study carried out to understand knowledge sharing in organisations. The authors assert that using ANT's concept of moments of translation as a lens to understand the phenomenon is a novel way of investigating the difficulty associated with sharing and managing knowledge.

The theory was also used by Mpazanje et al. (2013) in their study aimed at addressing the persistent IS project failure in Malawi. The theory was used to provide a deeper understanding of IS project processes and outcomes in Malawi. Shrafat et al. (2016) in their attempt to identify the role formality and informality play in information systems pre-evaluation process, also engaged the actor network theory to guide the study. The authors used the theory to trace practices associated with IS pre-evaluation throughout the IS investment process. Troshani & Wickramasinghe (2014) applied the theory in their study aimed at tackling the associated complexity in E-health. According to Cresswell et al. (2010), the ANT-based approach is conceptually useful in helping to appreciate the complexity of reality. To achieve the aim of this study, the Actor network theory is applied to analyse the study.

2.9 Conclusion

This chapter presents the review of literature related to this field of study. The chapter reviewed literature in respect of the information systems and information technology and the information systems and communication technology used by the selected banking institutions in Nigeria. The chapter also presents the literature in respect of banking services in Nigeria and highlights the challenges inherent. The existing literature in respect of evaluation models and the evaluation of information systems and information technology was also revealed. Finally, the chapter presents the literature in respect of the actor network theory; the theory used in underpinning the study. The chapter helps to reveal the gaps that exist in the literature and this helped bring the study into context.

The next chapter presents the research methodology that is used to collect the data required for answering the research questions.

Chapter 3

Research methodology and Design

3.1 Introduction

This chapter presents the methodology followed in achieving the aim of the study, which is to develop a framework which can be used to evaluate the banking information systems in the context of the Nigerian environment. In this study, the methodology includes philosophical assumptions, research approach, research methods, research design, data collection technique, and data analysis approach. The methods, approaches and techniques applied in this study were based on the objectives as presented in chapter one and revisited in this chapter.

This chapter is divided into seven main sections, in the following order: philosophical assumptions; paradigm; research approach; research methods; research design; data collection; and data analysis.

3.2 Conceptual Framework of the Study

The framework presents the methodology followed to achieve the aim of the study which was to develop a framework that can be used to evaluate banking information systems in Nigeria.

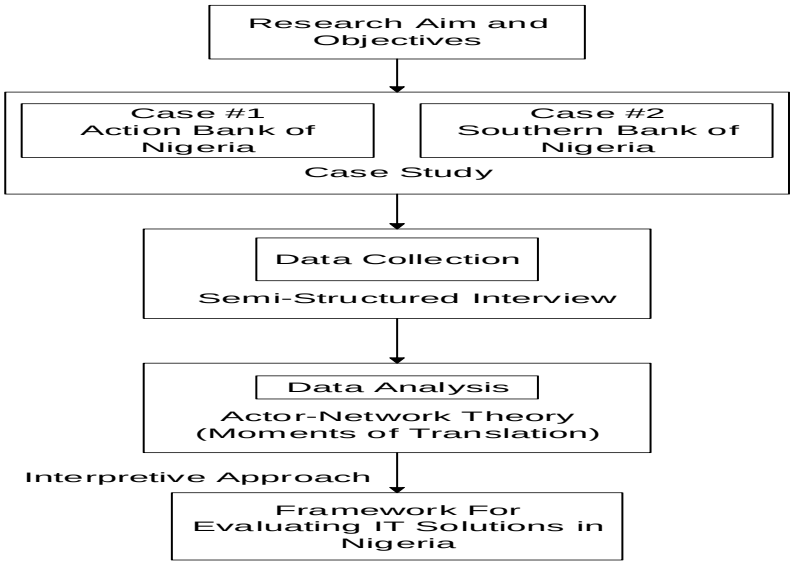

Figure 3.1: Conceptual Framework

The aim and objectives of the study dictated the research approach of the study which was the qualitative research approach. Based on the objectives of the study as detailed in chapter 1, the case study research design approach was adopted. Two cases were identified and selected for data collection purposes. The semi-structured interview technique was used to collect the required qualitative data. The actor-network theory was used to guide the analysis of the collected data. Moments of translation and black box from the perspective of the actor network theory were used to guide the analysis of the data. Based on the subjective nature of the collected data, the interpretive approach was followed to arrive at the findings for the study. The findings enabled the study to achieve its aim of developing a framework for evaluating the banking information systems in Nigeria.

3.3 Philosophical assumptions

The two main philosophical assumptions that are often followed in information systems (IS) studies are ontology and epistemology (Klakegg, 2016). According to Rahi (2017), ontology refers to the study of things that comprise many realities and how they exist. What this implies is that ontology is concerned with the nature of being and what exists (Al-saadi, 2014). As such, ontology focuses on such related questions as what things exist, in what form do they exist and what categories do they belong to? For example, in this study, what is known is that the banking institutions in Nigeria make use of information technology to provide services to their clients and partners. This is a reality and as such an ontology.

Epistemology is the study of knowledge and how knowledge is gained (Kivunja & Kuyini, 2017). Epistemology focuses on how to learn about reality (Ormston et al., 2014). Epistemology is about how knowledge about ontology can be gain (Porra et al., 2014). Epistemology seeks to discover what is known and how it is known. Epistemology focuses on questions such as what is knowledge, how is the unknown known and what is the basis for knowledge? For example, within this study, what was not known was how the technology engaged by the banking institutions in Nigeria are implemented and used. That which is not known was what this study wanted to know; hence epistemology.

Based on the objectives of the study, both ontology and epistemology assumptions are followed. This is because ontologically, there are various realities in the use of IS/IT solutions to enable and support banking processes and activities in the banking institutions of Nigeria. On the epistemology front, what is not known is how the Nigerian banking institutions employ, use, and manage IS/IT solutions in providing services to their clients. The study seeks to gain

knowledge from these perspectives. The assumptions are often associated with stance, which are of paradigm.

3.4 Research Paradigm

Critical realism, Positivism and Interpretivism are the three commonly used paradigms in IS studies (Clark, 2017). According to Antwi and Hamza (2015), the positivist paradigm explores knowledge through scientific experiments and tests, using quantifiable measurement. Eriksson and Kovalainen (2015) argue that the interpretivist paradigm on the other hand explores knowledge through the interaction and perception of those involved in the phenomenon.

3.4.1 The positivist paradigm

Positivists maintain that knowledge of reality is absolute and objective (Naidoo, 2019). As such, to understand a phenomenon, positivists employ scientific means, and explain the phenomenon using objective evidence. According to Kivunja & Kuyini (2017), deductive logic, formulation and testing of hypotheses, mathematical equations and calculation can help the positivists to derive conclusions about reality. Aliyu et al. (2014) suggest that positivism is indeed a research strategy that can be used in validating that reality is independent of the viewer or observer. However, Rehman and Alharthi (2016) argue that objective and scientific methods are appropriate for studying natural objects but that they may not be successful when applied to social phenomenon. Hammersley (2013) posits that the use of the positivist paradigm in social research projects is challenging, especially in measuring a phenomenon that relates to intentions, attitudes and thoughts of the people involved.

3.4.2 The Interpretivist Paradigm

Based on the objectives of the study, the interpretivist paradigm is followed. This is because the interpretivist paradigm allows the researcher to seek the understanding, meaning, interpretation and perception of people involved in the phenomenon being studied (Rehman & Alharthi, 2016). According to Gaaloul and Molnar (2014), reality is a social product and can only be understood through the social actors that construct the social reality. Rubin and Babbie (2010) assert that the Interpretivist paradigm can help to gain an understanding and interpretation of everyday happenings, experiences and social structures; as well as the values attached to these phenomena. Goldkuhl (2012) affirms that the core idea of interpretivism is to work with the subjective meanings already there in the social world. The author further argues that the acknowledgement, understanding and reconstruction of these subjective

meanings can be used as building blocks for theorising. As such, the study followed the interpretivist approach which allows a researcher to interact, understand, and assess the perception of those involved in the implementation and use of banking information systems in Nigeria; eventually helping to develop a theory.

3.5 Research Approach

Research approaches commonly used in IS studies are the deductive and inductive research approaches (Saunders et al., 2017). However, both deductive and inductive approaches can be combined, which is referred to as abductive (Bryman & Bell, 2011). Creswell (2014) asserts that a research approach is used to lay out plans and procedures for data collection, analysis, and interpretation.

3.5.1 The Deductive Approach

Deductive approach is a research strategy to test a hypothesis or theory (Adekoya et al., 2019). It is a strategy used by researchers, where a hypothesis is first developed, based on an existing theory and then a research strategy is designed to test the hypothesis (Williamson & Johanson, 2017). This approach works from the general to the specific, and is commonly referred to as top-down research approach (Mitchell, 2018). According to Chiedu et al. (2017), the deductive approach begins with the assertion of a general principle or belief and then proceeds to apply that principle to a given phenomenon. The data collected is deduced to reach a conclusion by testing the hypothesis constructed at the start of the research (Sekaran & Bougie, 2012). As such a deductive approach draws conclusions in line with known or established fact or reasoning; thus, making the approach objective in nature and often associated with quantitative methods (Bourezk et al., 2020).

The deductive approach has been used in some IS studies. For example, Tipi et al. (2017) adopted the deductive approach in their study to explore the factors influencing people's intention to adopt e-banking in China. Bankole et al. (2017) also used the deductive approach in their study to explore factors that influence cell phone banking in South Africa.

3.5.2 The Inductive Approach

Inductive approach is a research strategy that involves developing a theory based on the observation of empirical reality (Crowther & Lauesen, 2017). The approach works from the specific to broader a generalisation and theories (Mitchell, 2018). It is commonly referred to as

the bottom-up approach. Almigheerbi et al. (2019) assert that the inductive approach allows the researcher to first collect data, systematically analyse the data, and thereafter develop a theory of the phenomenon based on the data analysis. The inductive approach is normally associated with interpretivist study (Saunders et al., 2012). Gioia et al. (2012) argue that research has found out that a qualitative inductive approach is useful in investigating a phenomenon where researchers are exploring and trying to understand organisational experience.

The inductive approach has been used in some similar IS studies. For example, Johnston et al. (2016) used the inductive approach to provide an insight into the business value of cloud computing. Azrioual and Brundel (2018) also used the inductive approach in their study to explore the factors that influence the acceptance of mobile banking by organisations.

Based on the aim of the study, which is to develop a framework for evaluating the banking information systems in the context of the Nigeria environment, the inductive approach is used. This allows subjective reasoning and various realities to be induced into the problem being studied, towards finding a solution.

3.6 Research Methods

The qualitative method was employed based on the subjective nature and objectives of the study. An understanding of factors challenging the Nigerian banking institutions from the IT perspective was gained by investigating the perspectives and behaviour of the people in these situations and the context within which they act. Different methods are employed in studies to reach scientific conclusions. The two types of research methods commonly used in information systems study are qualitative and quantitative (Ben-Eliyahu, 2014). When these two methods are combined and used, it is referred to as the mixed method (Creswell & Creswell, 2017).

The quantitative research methods involve the use numerical and mathematical measurement and analysis (Gyanath & Amrithiai, 2017). In contrast, Gentles et al. (2015) argue that qualitative research methods focus on exploring and understanding people's perceptions, views, and experiences of the phenomenon being studied in a natural setting. The method focuses on why and how rather than what happened. The method is exploratory in nature and is mainly concerned with gaining insight and understanding on underlying reasons. The mixed methods involve the use of both or a combination of qualitative and quantitative methods in the collection and analysis of data in a study.

3.6.1 Quantitative Research Methods

The quantitative research methods are typically associated with positivist perspectives in social research (Das et al., 2016). According to Du Plessis (2017), the quantitative approach makes use of objective means such as numerical data and scientific methods to understand the characteristics of people and reality. Creswell (2013) asserts that quantitative research is aimed at testing objective theories by examining the relationship among the variables. The approach typically involves a researcher putting forward a theory; and the theory is then tested using hypotheses, and conclusions drawn thereafter with regard to the hypotheses (Rovai et al., 2014). The inquiry strategies commonly used by the quantitative methods for data collection include surveys and experiments (Soomro et al., 2020). This study does not involve numeric data and as such the quantitative methods will not be used. Based on the objectives, the study examines how and why IT/IS solutions were selected and used in the manner they were.

3.6.2 Qualitative Research Method

The qualitative research methods focus on understanding some aspect of social life (McCusker & Gunaydin, 2015). According to Mardis et al. (2014), qualitative methods can provide rich descriptions to explore and understand complex, multi-layer and multi-causal social perspectives and dynamics. Goldkuhl (2019) asserts that qualitative methods can allow scholars to access many parts of the empirical field and to collect different types of data. This approach can help build partnership with study participants, which can lead to deeper insight into the context under study, adding richness and depth to the data (Antwi & Hamza, 2015). Patten and Newhart (2017) affirm that this approach gives the researchers the opportunities to interview people, observe settings and analyse the data by reviewing interview transcripts. This implies that the qualitative methods allow researchers to have conversations, get explanation and discuss with the actors involved.

Due to the subjective nature of this approach, results or data are primarily presented through words. This attribute has strong potential for revealing complexity, through focusing on problems in their social and cultural environment (Henttonen et al., 2017). Based on the subjective nature and objectives of the study as contained in chapter 1, the qualitative method is used. Leedy and Ormod (2014) assert that qualitative research methods can provide abundant facts about real life people and situations.

3.7 Research design

Research design defines the approach that would be employed in conducting the study. Some research design methods commonly used in IS studies include ethnography, survey, action research and case study (Kupfer, 2018). According to Kothari (2008), research design refers to the conceptual structure within which research is conducted. Research design helps with defining the environment within which the study is being carried out. Based on the aim of this research as stated in chapter 1 above, the case study method will be applied.

Ethnography is the study of people in their natural context (Trusko, 2016). This approach involves up-close personal experience and participation of the researcher in the natural environment of the people under study. According to Reeves et al. (2013), ethnography can be used to gather observations, interviews and documentary data which helps produce detailed and comprehensive accounts of various social phenomena. Madden (2010) suggests that ethnography can be used to gain an understanding and making sense of human life, communities, and their everyday practices and rituals.

Survey is a data collection method for gathering information from a sample of a population through their responses to questions (Check & Schutt, 2012). According to Boman et al. (2018), survey involves the use of questionnaires for collecting data from a sample taken from a given population. Njoku et al. (2017) assert that survey is suitable where a group of people or items are considered to be representative of an entire group. Ndofirepi and Rambe (2016) suggest that survey is suitable for the collection of large quantities of data. This can be attributed to why the method is commonly associated with the quantitative studies. It is the method that is commonly used for collecting information about a population of the same interest group that is spread, often across a geographical location (Sarowar et al., 2018). This study had a specific focus, which is banking institutions in Nigeria.

Action research is an approach where a research is carried out to identify a problem and based on the findings develop a solution (Bryman & Bell, 2011). According to Malmi (2016), action research is an interventionist study in which researchers participate in the change process. The intention of an action research is not to create a theory but to improve the process or phenomenon under study. Messiou (2019) asserts that action research enables a researcher to investigate, identify the problem, plan an intervention, observe the changes, and reflect on the changes observed. This approach did not fit the study primarily because the objectives did not require the observation or monitoring of any type of actions.

3.7.1 Case Study

The case study approach was used in the study. This is mainly because the approach focuses on the empirical inquiry of a contemporary phenomenon within its real-world context. Milani et al. (2016) refer to case study as an empirical method useful for investigating a certain reality within its real-life context, particularly when the boundaries between what is being studied and its context are not clear. Onatu (2013) asserts that case-study enables researchers to study information in its natural settings and to answer the “how” and “why” questions to gain more explicit information.

Case study enables researchers assess the nature and complexity of the process taking place. Love et al. (2016) assert that the case study approach can help to gain practical in-sights about industry-specific problems that are being addressed and therefore enable learning and changes in practice to occur.

A case study can be used to explore a real life contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (Creswell, 2013). Baxter and Susan (2008) affirm that multiple cases enable the researchers to study and compare findings between the cases; and thus, explore the differences within and between, to forecast the results.

The case study approach is commonly used in qualitative studies where there is a need to carry out an empirical investigation of a phenomenon in its natural setting. The case study approach, though commonly used, has its strengths and weaknesses too.

Strengths of the case study approach

Some of the strengths of using the case approach include the following:

1. The case study approach provides information required to have a deep insight and explanation into complex processes which may not be achieved using quantitative methods (Barratt et al., 2011). The case study can provide the information required to gain an understanding of the complex processes that are involved in the selection, implementation and use of information systems and information technology within the selected Nigerian banking institutions. This is because it provides an avenue to get the information required from the natural settings in which these processes are used.
2. The case study draws evidence from multiple sources to show relationships between elements and processes in multiple cases (Gillham, 2000). The case study allows a researcher to draw evidence from two banking institutions within Nigeria with different

business outlays to show the relationship between their elements and processes. Thus, it gives a researcher the opportunity to compare (Baxter & Susan, 2008) and to draw a conclusion.

3. The case study approach provides information required to build novel theoretical insights from case-specific contextualised findings (Eisenhardt & Graebner, 2007). The case study approach provides information from the banking institutions in Nigeria required to build theories from the findings gathered.
4. The case study approach also provides an avenue for the collection of empirical and context-dependent knowledge from diverse groups of respondents with deep knowledge and experience within the banking institution in Nigeria. According to Lincoln and Guba (2009), the case study can develop empirically collected and context-dependent knowledge with a multiple wealth of details.

Weaknesses of the case study approach

Despite the strengths of the case study approach, there are some weaknesses associated with the use of the approach.

1. A common and well-conceived notion is that the case study approach lacks the ability to generalise its findings. Luo et al. (2017) assert that case study research is widely criticised for lacking external validity as one case provides no basis for the apparent generalisation to a wider population beyond that case.
2. Another major weakness associated with the use of the case study approach is biasness on the part of the researchers. Easterbrook et al. (2008) argue that a major weakness of the case study is that it is susceptible to various interpretations and researchers bias in the collection and analysis of data.

To achieve the objectives of the study as stated in chapter 1, the researcher noted and addressed the above stated weaknesses in the actual study.

How the weaknesses were addressed.

To establish the validity and dependability of the study, the researcher addressed these weaknesses commonly associated with the case study approach. Saunders et al. (2009) refer to validity as the purpose-driven ability of data to measure what they are intended to measure. The weaknesses were addressed as follows:

1. To mitigate against the challenge of lack of ability to generalise the findings of a case study, the researcher adopted a multi-case study approach. Two banking institutions

in Nigeria were identified and selected as cases. A banking institution with a relatively big banking operations and that deploys an equally relatively big IS/IT resources was selected to represent the big banking institutions operating within the country. The other case selected is a banking institution operating in Nigeria with a relatively smaller banking operations and that also deploys a smaller IS/IT resources; to represent the small banking institutions operating in the country. This is to gain an understanding of how the big and small banking institutions in Nigeria implement and use the IS/IT solutions employed for services production and delivery. The use of two banking institutions gave the study the ability to draw a more generalised inference.

2. To avoid the challenge of biasness, the researchers employed the use of indirect and open-ended questions which allow the respondents to express their understanding and knowledge in their own words during the collection of the data. To mitigate against biasness in the analysis of data, the triangulation approach was employed. Chan and Fu (2018) argue that triangulation can be deployed by combining different methodologies to theorise, test and retest social phenomena. The triangulation approach allows for the presentation of a wide range of views on a particular issue, together with the formulation of an informed conclusion after a critical analysis. Other sources of data, such as documents were used during the analysis of data and considered in drawing conclusions.

Based on the objectives of this study, a multiple case study approach is adopted to have an in-depth understanding of the phenomenon under study. There are twenty-two commercial banks in Nigeria. Criteria were formulated and used to select the banks that can participate in the study. The criteria are as follow: (1) The banks carry out banking activities and operations in Nigeria; (2) the banks deploy information technology solutions for the provision of their products and services; and (3) the banks give consent to be used as cases for the study.

Pseudo names were used to represent the banks, as requested by the organisations. This has to be adhered to, as part of the ethics code of conduct explained in section 3.10. As such, the first case is known as Action Bank of Nigeria Plc. in this study. It is a banking institution in Nigeria with its head offices situated in Lagos, Nigeria. The organisation provides banking services to its clients and partners within and outside Nigeria. Similarly, the second case is known as the Southern Bank of Nigeria Plc. in this study. It operates within Nigeria and has its head office in Lagos, Nigeria. The organisation provides banking services to its clients within

Nigeria only. Comprehensive details about the organisations are provided in chapter 4 of this thesis. Participants from each of the organisations are presented in section 3.7.4. below.

The Case studies: Banking institutions

The two banks used as cases in the study are discussed here. This includes the rationale for selecting the organisations:

1. **Action Bank of Nigeria Plc.:** The Action Bank of Nigeria (ABN) Plc. is used as a case in this study because of the reasons stated below. It is considered to be a large bank on the basis of its workforce, in the context of the country. The bank was selected to represent the large banks in the country. This is primarily because their settings are similar and they operate in the same ways. The banking institution engages the services of information technology solutions, which is the perspective this study employs for its engagement.

   The bank was selected for this study for three main reasons: (1) it is one of the few banks that has leveraged the use of IT/IS solutions to grow its business, from a network of 150 branches about eight years ago to over 600 branches in recent years; (2) it has one of the largest IT departments in the country; and (3) most importantly, of the twenty-two banks that were approached, it was one of the few that granted access.

2. **Southern Bank of Nigeria Plc.:** Southern Bank of Nigeria (SBN) Plc. was grouped in the category of smaller banks in Nigeria. The bank was used as the second case in the study. The bank is used to represent the smaller banks in the country. Similar to the large banks, the smaller banks share many commonalities, such as services, settings, and use of the same IT solutions.

   The organisation, SBN Plc. was selected based on the following reasons: (1) it is one of the few first generation banks that has fully digitalised its banking operations in recent years; (2) it has one of the fastest growing network of branches that are backed by a robust ICT platform; (3) the IT department is relatively smaller than that of case #1; and (4) out of all the banks approached, it is one of the few banks that granted the researcher access.

Data was collected from the two cases. The selection of the two cases allowed the researcher to explore and compare how big and small banks in Nigeria implement and use IS/IT solutions. Details about the cases are presented and discussed in the next chapter.

3.8 Data Collection

Data collection is a process of gathering data using certain methods to meet specific objectives and to answer research questions (Burns & Grove, 2010). The goal of data collection is to capture quality evidence that translates into a rich data analysis and that allows for the building of convincing and credible answers to research questions (Syed & Sudhakar, 2017). Data collection component of research is common to all fields of study including information systems field. Viswambari and Selvi (2014) assert that in data collection, the emphasis should be on ensuring an accurate and honest collection. Miles and Huberman (1994) argue that only holistic and good rich data can reveal the complexity of the original study and the examined issue.

In information systems study, there are different techniques that can be used to collect data. They include observation, document analysis, and interview (Walliman, 2011; Njie & Asimiran, 2014). These techniques are discussed as follows:

3.8.1 Observation

Observation refers to an empirical method for generating accounts of first-hand, real-world and naturalistic events to gain an insight into defining their characteristics and contextual qualities (Berg, 2004). It is an approach that involves an on-the-spot account of behaviour, events, actions and interactions in an individual or group setting (Merriam & Tisdell, 2016). The advantage of observation is that it captures what people are doing in the actual situation (DeWalt & DeWalt, 2002), and based on the observed, questions can be asked. However, debates have risen on how best to conduct observations, especially with regard to researcher's bias (Katz-Buonincontro & Anderson, 2018).

3.8.2 Documentation

The term "document" covers heterogeneous sources of data which include personal documents, official documents, mass media output, and virtual output like internet resources (Bryman, 2016). According to Wolff (2004), documents are a distinct level of data in research. As such, researchers make use of any public or private records related to the given phenomenon obtained from site or the participants in a study (Creswell, 2012). To extract information needed from documents, researchers need to skim, read and interpret the acquired documents (Ozkul et al., 2017).

Wach and Ward (2013) refer to document analysis as a rigorous and systematic process of analysing the content of written documents. As such, to extract rich data, the process of document analysis needs to be carefully planned to ensure effectiveness. Effective planning includes setting criteria for document selection; collecting documents; articulating key areas of analysis; and document coding and analysis (Wach & Ward, 2013).

Document reviews are very important and a supportive complementary technique that can be used as a means of triangulating other data collection techniques (Mohd Tobi, 2012). This approach can enhance the data and the overall study quality.

3.8.3 Interviews

The interview approach is a technique that allows people to speak in their own voice and express their own thoughts and feelings. According to Berg (2007), interview approach is that which allows a researcher to access people's experiences and perception of reality. The approach also gives room for further clarification, allowing the researcher to clarify all incomplete or unclear issues by asking additional questions (Al Kilani & Kobziev, 2016). Yin (2014) argues that one of the most important sources of data in the case study research design is the interview. There are three types of interview; the structured, unstructured and semi-structured.

Structured interview

Structured interview is also known as standardised or scheduled interview. The interview approach is that in which the questions asked during the meetings are standardised questions, pre-determined and dictated to the respondents exactly as they are on the schedule and in the same order (Canals, 2017). The questions asked are commonly close-ended questions that require only "yes" or "no" answers. The responses to the questions are rational and factual with little room for subjectivity. With the structured interview, flexibility and variations are minimised while standardisation is maximised (Punch, 2013). This type of interview tends to provide quantitative data or data than can be better quantified (Canals, 2017). Thus, this type of interview is usually suitable for quantitative research, such as surveys (Brinkmann, 2014).

Unstructured interview

In contrast to the structured interview, the unstructured interview is very informal (Bernard & Bernard, 2013). The questions asked during this type of interview are not standardised, not pre-determined and are open ended (Muthanna, 2019). The questions asked emerge over

time, based on the researchers' observations (Basole & Ramnarain, 2016). The responses to the unstructured interviews are in descriptive or narrative form, making the responses flexible; unlike the structured one (Merriam, 2009). With this type of interview, the researchers have room to explore more general areas in greater depth (Shepherd, 2015). Unstructured interviews can be used to recover large unfiltered responses from participants (Starr, 2014), which can reveal a lot of details about the phenomenon under study. However, this type of interview can take too long and may lack precision (Alsaawi, 2014).

Semi-structured interviews

The semi-structured interview is the most commonly used in qualitative study (wan et al. 2016). It is a data collection method that consists of both elements of structured and un-structured interviews (Dikko, 2015). In the semi-structured interview, the interview guide contains both open and close-ended questions (Adhabi & Anozie, 2017). This type of interview allows the dialogue to meander around the topic on the interview guide rather than adhering to close-ended questions as used in the structured interview (Angolia & Reed, 2016). Just as in the unstructured interview, the questions and sequence in the course of the interview are based on participants' responses. This framework and flexibility of the responses is what constitute the semi-structured aspect of this method (Mojtahed et al., 2014).

A main attribute of the semi-structured interviews is that it allows for considerable reciprocity between the participants and the researcher. Galletta (2013) asserts that semi-structured interviews create space for the researcher to probe participants' responses for clarification, meaning making and critical reflection. To probe further, researchers can follow up with "how" and "why" questions. The semi-structured interview is popular in IS studies because it gives the researcher the opportunity to explore the topic in more depth, using both the pre-prepared questions and improvisation (Myers & Newman, 2007).

Based on the objective and aim of the study, the semi-structured interview is used. This is based on the subjective nature of the study, which is to gather individuals and groups' views and opinions in respect to the phenomenon being studied. Data was collected from the cases, using the semi-structured interview. The participants were identified and selected based on the criteria set, which are as follows for the IT units: (1) the participants must have been in the organisation (IT department) for over twelve months and (2) the participants must have been involved in the selection and implementation of IS/IT solutions. The following criteria were used in the identification and selection of business operation units: (1) the participants must have

been in the organisation (department) for over twelve months, (2) the participants use IT systems for their processes, and (3) the participants must have participated in a change process. Knowledge and experience are more like documented materials that store answers to questions needed to gain an understanding (Rong et al., 2017).

3.8.4 Fieldwork

The fieldwork was carried out in line with the research methodology highlighted in chapter 3. The fieldwork section presents the description of the environment and activities that are used in the collection of data needed to achieve the objectives of the study.

Pre-Interview

As a requirement, students conducting research which involves interviews must duly obtain consent letters from the university before the data collection begins. The consent was requested for and duly issued to the researcher. Thereafter, the researcher sent the consent letter to the organisations that were identified, based on the criteria set for the selection of the case study. On receipt of the letter, the organisations requested for further clarifications from the researcher. When the organisations received the clarifications required, the consent letters were signed and returned to the university. With the consent letters, the researcher engaged the managers of the IT and business departments of both organisations on how the interviews would be conducted. The selection criteria of participants were also discussed. The set criteria helped in identifying the participants interviewed. The selection of the participants was based on the following criteria; (1) the participants must have been in the departments for more than a year; (2) the participants must have been involved in the implementation and use of IS/IT solutions engaged by the organisation; and (3) the participants must be willing to participate in the research study. This is in line with the ethical consideration that governs research studies conducted in CPUT.

During the interview

The interviews were conducted in the various offices of the two cases identified and selected for the study. The primary focus of the study was on the departments that implement and use IS/IT solutions engaged by the organisation for their business processes and activities. As such, the Information Technology and Business (operations) departments were selected for the collection of data in both cases. The semi-structured interviews were conducted with the officials in these departments. The interviews were conducted with the participants identified and selected based on the set criteria. The set criteria were that the participants must have

been in the department for over twelve months and must have a knowledge of the activities within the department. The researcher believes that twelve months' experience was adequate for the participants to understand the activities and processes within the departments.

As stated in the ethical consideration, the participants were notified of the purpose and intention of the study. They were also informed about their rights to freely withdraw from the exercise when so desired. This was done to let the participants know that their participation in the study was voluntary. This is important to gain their confidence and cooperation in making the interview with each participant a reciprocal one. All the participants gave the researcher the permission to record the interview, except one. With that participant, the researcher had to take notes all through the interview. With the other participants that gave the researcher permission, both voice recording and notes were taken.

Interview from Case #1: Action Bank of Nigeria (ABN) Plc.

The interviews at Action Bank of Nigeria were conducted at four different locations within the organisation; the head office, the head office annex and two branch offices. In this organisation, a total of six interviews were conducted; three each in both the IT and business operations departments. In the IT department, a manager, an IT administrator and an IT support officer were interviewed. In business operations, a business manager, an operation officer and a branch banking coordinator were interviewed. The longest interview was one hour thirty-eight minutes (1hr 38mins) and the shortest was 27 minutes. The interviews with the IT officials were conducted at three different locations, given the structure of the IT department. The interviews with the business officials were conducted in their respective offices at the head office and two branch offices. The semi-structured interview approach was adopted with all the participants. All the interviews were conducted individually, guided by the interview guideline. The medium of communication was English.

Interview from Case #2: Southern Bank of Nigeria (SBN) Plc.

The interviews at Southern Bank of Nigeria were conducted at two locations within the organisation; the head office and the branch office. In this organisation, a total of six interviews were also conducted; three each in both the IT and business operations departments. In the IT department, a manager, an IT application support officer and an IT governance, risk and compliance officer were interviewed. The longest interview was one hour eighteen minutes (1hr 18mins) and the shortest was 17 minutes. The interviews with the IT officials were conducted in the IT conference room. In the business department, a branch operations head,

an international trade operations officer and an operational compliance officer were interviewed. The interviews with the business operations officials were conducted at the head office and at the branch office. The semi-structured interview approach was adopted with all the participants. All the interviews were conducted individually, guided by the interview guideline. The medium of communication was English.

Interview Guideline

The interview sessions were guided by the use of interview guidelines developed by the researcher before the commencement of the interactions. The interview guidelines act a guide in respect of the questions to ask, the sequence of the questions and how to pose follow-up questions. The guidelines were used during the interviews with all the participants that were involved in the study. These guidelines were developed to help the study to answer the research questions. The research questions are as follows:

Research questions

The main research question is how can the challenges that affect IS/IT solutions used for the banking activities in Nigeria be addressed? In order to develop a framework, the current challenges must be identified and understood. In answering this main question, sub-questions were formulated as follows:

1. How are IS/IT solutions applied for banking activities by the Nigerian banks?
2. What are the factors that influence the implementation and use of IS/IT solutions for banking purposes in Nigeria?
3. How are IS/IT solutions identified, selected and evaluated in the Nigerian banking institutions?

These sub-questions guided the development of the interview guidelines used during the interviews. The data required to answer the main question were derived from the responses received from the interview guideline, questions and follow-up questions. The interview guideline assisted in the collection of required data needed to achieve the aim of the study, which is to develop a framework that the banking institutions in Nigeria can apply in the evaluation of their IS/IT solutions.

Organising the data

After each interview, the researcher transcribed it word for word. This process was followed for each of the interviews conducted. To ensure correctness, the transcribed interviews were then matched with the notes taken during the interviews. After transcribing the data, the

researcher cleaned the data to make sense out it. The transcriptions were then formatted and stored as word documents for each organisation. Each of the document' s pages and lines were numbered for the purpose of referencing required during data analysis. Also, each of the participants was labelled; this is to protect the identity of the participants. Based on the coding, a referencing standard was formulated and adopted. The referencing standard comprised of the organisation's name, the participant, the page number, and the line of the transcribed document.

Organisation and participants

Tables 3.1 and 3.2. below present the demographics of the participants in the study, from the two cases, respectively.

Table 3.1: Case #1: Action Bank of Nigeria (ABN) Plc.

Unit	Position	Participant #
Technical IT	IT Manager	2
	IT Administrator	2
	IT Support	1
Non-technical Business	Business manager	3
	Business Operations Officer	2
	Branch operation co-ordinator	1
Total		11

Table 3.2: Case #2: Southern Bank of Nigeria (SBN) Plc.

Unit	Position	Participant #
Technical IT	IT Manager	3
	IT governance, risk and compliance	1
	IT Application support	1
Non-technical Business	Business manager	3
	Operations compliance officer	1
	International trade Operation officer	1
Total		10

Coding of participants

The participants in the study were coded by giving them pseudo names as stated below. This was to avoid disclosing the identity of the individuals as well the organisations. The approach aligns with the code of ethics as discussed in section 3.10.

Action Bank of Nigeria: Participant – ABN01 to ABN11

As stated in Table 3.1, there were eleven (11) participants. The name of the organisation, Action Bank of Nigeria was abbreviated as ABN. The number of participants and the abbreviation were used as the codes. The participants were therefore coded as follow: ABN01 to ABN11. This means that ABN01, ABN02, ABN03 represent participants' numbers 1, 2, 3. ABN: Name of organisation; and 01 to 10: the number assign to participants.

Southern Bank of Nigeria: Participant – SBN01 to SBN10

As stated in Table 3.2, there were ten (10) participants. The name of the organisation, Southern Bank of Nigeria was abbreviated as SBN. The number of participants and the abbreviation were used as the codes. The participants were therefore coded as follow: SBN01 to SBN10. This means that SBN01, SBN02, SBN03 represent participants' numbers 1, 2, 3. SBN – Name of organisation; and 01 to 10: the number assigned to participants.

3.9 Data Analysis

Data analysis brings order, structure and meaning to the mass of data (De Vos et al., 2011). It is required to gain meanings and understanding from data sets needed to answer research questions. These answers were significant for achieving the aim and objectives of the research.

In this study, the interpretivist approach is used to analyse the data collected. This is mainly because the primary data collected are qualitative data which were extracted from individuals and groups' subjective views and opinions. In addition, or in complementarity, some IS studies employ tools and theories as a guide or framework. (Sekgweleo et al., 2017) assert that applying a theoretical lens in research study enables a deeper insight and analysis. Based on the objectives of the study, the moments of translation and black box from actor network theory's perspective are applied to guide the analysis of the data. Within the interpretivist approach, ANT is applied to guide the analysis as follows:

1. To establish and examine the various networks that exist in the use and management of the banking systems. This includes how the networks were formed for the purposes of the systems' operations.
2. To examine the relationship between technology-to-technology; technology-to-human; and human-to-human in their use of the systems to provide banking services to both clients and business partners. The relationship will help to extract the factors which influence how systems are used and managed for banking purposes.
3. To examine the roles of the various actors, from both human and non-human perspectives, in the use and management of the systems. This will help to formulate criteria, towards the development of a framework for systems' evaluation.
4. ANT's black box is used to decompose and explain the hidden complexity in the implementation and use of information systems in the cases studied.

3.10 Units of Analysis

Unit of analysis defines where the researcher obtains data for the case study (Singh, 2014). Based on the objectives of the study, the unit of analysis is divided along two units: the ICT and the business unit. They are the units that are involved in the implementation and use of the IS/IT solution engaged for service delivery in the Nigerian banking institutions. Coughlan et al. (2012) assert that an understanding of collective activities that pertain to a particular team can be gained through units of analysis.

Table 3.3: Unit of Analysis

Case	Unit #1	Unit #2
Case #1 Action Bank of Nigeria	Information Technology Division	Business Division
Case #2 Southern Bank of Nigeria	Information Technology Division	Business Division

3.11 Ethical Consideration

Ethical consideration is the code of conduct that governs researchers carrying out research studies (Sekaran & Bougie, 2012). Ethical considerations are considered the obligations researchers have towards participants in research studies. These obligations include respecting the rights, needs, values and desires of the respondents who participate in a

research study (Creswell, 2014). During a research, respondents need to be made aware of their right to participate or not, not to be harmed and to be able to consent to the research (McDermott, 2012). Dayour (2018) asserts that ethical considerations are necessary to address the issues of informed consent, confidentiality, anonymity and researchers' honesty. Ethical considerations help reach responsible research and honesty that gives no harm to the research participants (Hadi, 2020).

This study adhered to the Cape Peninsula University of Technology (CPUT)'s research Code of Practice on Ethical Standards. The following ethical codes of conduct were adhered to:

1. A letter of consent was obtained to conduct the study
2. The participants were aware of the intention of the research
3. The participants were made aware that their participation was voluntary and that they could withdraw from the process at any given time.
4. The confidential information that could cause harm to the participants or the organisation was kept as such.

The research code of conduct conformed to the university (CPUT) policy.

3.12 Conclusion

Based on the objectives of the study, the most appropriate methods, approaches, and techniques were selected. These enabled the collection of rich data, a well fitted design, and a comprehensive analysis of the qualitative data. The ethics' code of conduct, which enabled the credibility of the study is also presented in the chapter. This led to the findings, which answered the research questions as presented in section 3.8.4. The next chapter presents and discusses in detail the two organisations that were used in the study.

Chapter 4
Case study Overview

4.1 Introduction

This chapter presents the organisations used as cases in this study. This includes their background, their organisational structures and their IT structures. The data collected from the cases provided the understanding required to achieve the aim and objectives of the study. The aim of the study was to develop a framework for evaluating the information systems used by the banks in Nigeria. The objectives of the study are as follow:

1. To examine and understand how IS/IT solutions are identified, selected and evaluated in the Nigerian banking institutions.
2. To examine and understand the factors that influence the implementation and use of IS/IT solutions for banking purposes in Nigeria.
3. To establish how IS/IT solutions are applied for banking activities by the Nigerian banking institutions.

To achieve these objectives, the same qualitative types of data were collected from the two banking institutions in Nigeria. Also, the same type of technique, the semi-structured interview was used to collect the data from the two organisations. The units of analysis were the IT and the business departments within the two organisations. This was because the IT department in each of the organisations were responsible for the selection, implementation and use of the information systems. This means that the IT department enabled and provided support to the employees and business operations and activities of the organisations.

Two organisations, Action Bank of Nigeria (ABN) and Southern Bank of Nigeria (SBN) were used as cases in this study. For the purpose of confidentiality and ethical reasons, the organisations were assigned pseudo names.

The chapter is structured into three main sections. The first two sections present the overview and the structure of ABN and SBN, respectively. This includes their organisational structures, discussion about the organisation of the IT departments, and the responsibilities of the teams within the IT departments. The third section summarises the chapter.

4.2 Overview of Action Bank of Nigeria

Action Bank of Nigeria (ABN) is considered a second-generation banking institution in Nigeria. This could be attributed to the fact that the bank (ABN) commenced its banking operations in the 1980s. The bank holds an international banking authorisation from the Central Bank of Nigeria. The license allows the bank to operate banking business within and outside Nigeria. The Central Bank of Nigeria regulates the banking business and activities of the banking institutions in Nigeria. The organisation's head office is situated in Lagos, Nigeria. The bank has branches in all the states of the country and in some African countries. As of the time of the study, the bank had a network of over 600 (six hundred) operational business offices, over 5000 banking agents and a staff strength of 4000 (four thousand). One hundred and fifteen (115) of these business offices were situated in the Lagos area; the biggest commercial city in the country.

The products and services offered to the organisation's clients and business partners include different classes of account; loans; advisory services; retail banking, wholesale banking, investment and transactional banking solutions and services. These products and services are tailored towards meeting the needs of their different clients and business partners which include the various government departments, financial institutions, multi-nationals, small and medium-size enterprises and individuals. These services are provided through three customer-focused business divisions; the personal banking; commercial banking and the corporate banking divisions.

The personal banking division focuses on providing customers with their everyday banking needs. The focus of this division is on individuals, high network individuals and un-incorporated bodies. The everyday banking need is aimed at providing and equipping the customers with the right accounts they need for the daily life they live. The accounts and services provided to the customers include current account, savings account, debit and credit cards, loans and investment solutions. The commercial banking division focuses on local corporate and small and medium enterprises. The products and services provided to the clients include digital, trade, cash management and lending solutions to take care of their business needs. The corporate banking services include transaction banking, loan and liquidity, investment banking and business management services. These services are mainly directed at the corporate clients.

The organisation uses information systems and information technology solutions to enhance and support the business processes and activities that are involved in providing their services and products to their clients and partners. Some of the IS/IT solutions deployed allow the customers to access the institution's banking products and services through a wide range of electronic channels. With the deployment of these digital solutions, some of the bank's clients and business partners are able to carry out their banking activities without coming to business offices. The banking services enabled by these digital solutions include the transfer of funds within and outside the country; receiving and sending money; online banking activities; account management, account opening and management; requests and enquiries; and communication.

Action Bank of Nigeria also offers a wide of range of debit, credit and prepaid cards which allow their clients and partners access their accounts via ATMs, mobile devices, internet and POS terminals at various merchant locations and websites. Action Bank of Nigeria's debit electronic cards are accepted locally and internationally in nearly two million ATMs and over 30 million point of sales terminals. There are about 2 million registered customers on the organisation's mobile platform, nearly 60,000 registered merchants on the electronic payment platform, over 20,000 banking apps downloads and 2000 business organisations using their OMNI channels.

4.2.1 Organisational Structure

The organisational structure details the hierarchy and divisions within an organisation. It shows how information and authority flow between the different levels within an organisation. This section details the different roles within the organisation and the responsibilities assigned to each division and unit (department). The organisational structure of Action Bank of Nigeria is presented in figure 4.1. below.

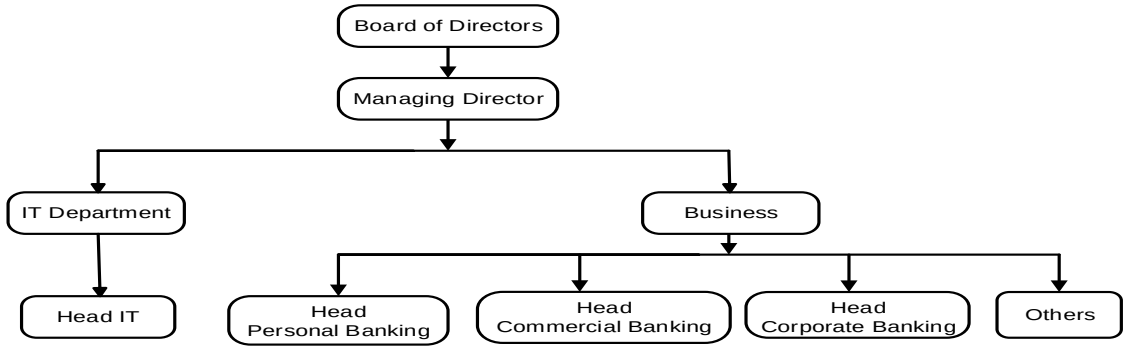

Figure 4.1: Organisational Structure

The affairs of the Action Bank of Nigeria are managed by the board of directors (BoT). There are eleven members on the board of the bank; the chairman and ten other directors. The ten members are made up of three executive directors, four non-executive and two independent directors. The three executive members are the managing director and two executive directors. The organisation's day-to-day activities are managed by the managing director who reports to the board of directors.

The managing of director of Action Bank of Nigeria oversees the overall activities of the organisation. His duty includes overseeing the activities of the business and IT divisions. The business division consists of personal banking, commercial banking, corporate banking, and others. The roles and responsibilities of the managing director include the following: reports the state of affairs of the bank to the board of directors; (2) manages the resources of the organisation, which include human and other non-human resources; (3) ensures quality products are delivered competitively and lower operating costs; (4) ensures the bank achieves its goal and objectives. This includes ensuring that the bank is profitable and competitive; (5) researches and implements new initiatives to achieve the business goals and objectives, including IT initiatives; and (6) ensures that the organisation leverages on the potentials of information technology to increasingly grow business and profitability.

The achievement of set business objectives and goals can only be attained through the activities of the business and IT divisions. The business division drives service production and delivery while IT enhances and supports the activities and processes that are involved in the delivery of services with technology. The business division is made up of three business groups; personal banking, commercial banking and corporate banking groups. All the group heads of business report to the manging director. These group heads co-ordinate their different groups' business activities to ensure that the set business targets are met. Their responsibilities include: (1) report the state of affairs of their respective groups to the chief executive officer of the organisation; (2) research and develop plans and strategies to achieve set goals; (3) develop products and services that are competitive; (4) ensure adequate training of their staff; (5) liaise with other business groups and other support units to achieve set business goals and objectives; and (6) grow their respective balance sheets in terms of assets and liabilities.

The other units of the organisation classified as the others provide support services to the business division. The others include the human resources, financial control, treasury,

corporate affairs, legal, compliance, and control departments. Their respective heads also report to the chief executive officer. The other business units of the organisation support the three core business divisions in achieving business objectives. The human resource unit supports business by recruiting, motivating and creating a conducive working environment for the staff of the organisation. This is to ensure that the right skills are employed to achieve the business objectives. The financial control unit supports business by keeping and managing the organisation's books. They are the accountants of the organisation, ensuring that the account entries are rightly passed into the relevant P&L accounts and balance sheet.

The treasury unit manages the organisation's liquidity and investments, ensuring that the organisation's finance is well managed and the business remains a going concern. Compliance and control ensure that the organisation adheres to and complies with the rules and regulations guiding the business activities. Compliance is key in the financial industry to help prevent undue exposure to litigations and fines. The corporate affairs department is responsible for the image building and communicating with the public, communities and government departments. The legal department is responsible for drafting, vetting and interpreting legal agreements. The department also handles all the related legal cases that arise in the course of business activities.

The IT department is headed by the head of IT/CIO. The department manages the IS/IT solutions that are used by the business division for their activities. These solutions are used by the business to support and enhance their daily activities. They report to the organisation's chief executive officer.

4.2.2 IT Structure

Action Bank attributes its remarkable achievement in the Nigerian banking industry to the various IT initiatives undertaken in the last 10 years. These initiatives are driven and managed by the organisation's IT department. The organisation's IT department is headed by the chief information officer/head of IT who reports to the managing director and closely works with the business divisions to achieve business goals and objectives.

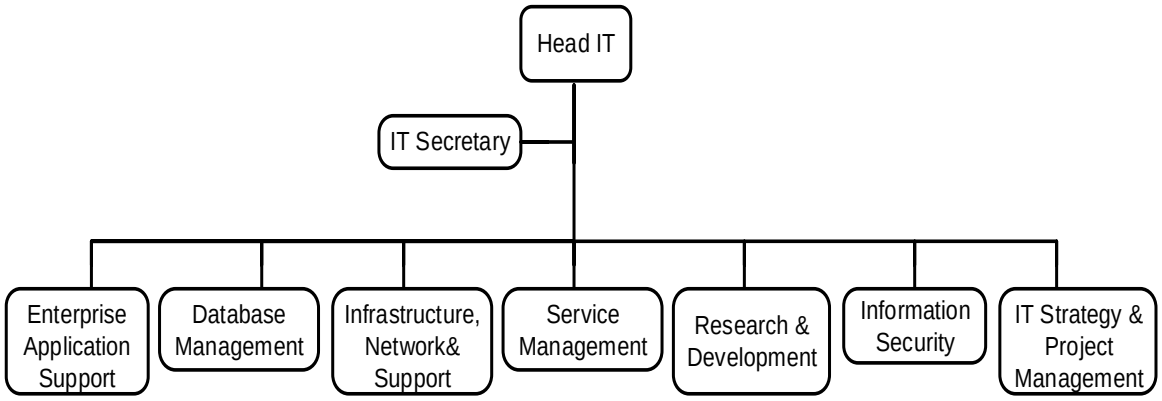

Figure 4.2: IT Structure

The roles and responsibilities of the entities that make up the IT department are as follows:

Chief Information Officer (CIO)

The CIO is the most senior staff in the IT department. He is responsible for leading and directing the organisation's IT management strategies and initiatives. The head IT's duties include (1) Report the state of affairs of his department to the managing director of the organisation; (2) Map out the bank's IT strategy and policy; (3) Develop IT policies that detail how IT solutions are utilised and applied; (3) Ensure the security of information; (4) Oversee the processes and technologies within the bank; and (5) Ensure that the IT investments align with business goal and objectives.

The head of IT department supervises the activities of the department which comprise the following units; Enterprise Application Support, Database Management Unit, Service Desk/Service Management, Research and Development (Innovation & Application Development), Information Security Unit and IT Strategy and Project Management. The roles and responsibilities of the units are as stated below:

Enterprise Application Support

The unit manages the resolution of applications and systems issues within the organisation. Their roles also include (1) Provide technical support to departments within the organisation and external clients; (2) Provide assistance during systems integrations; (3) Identify and resolve technical issues; (4) Manage the ticketed query system and ensure the database of queries and resolutions are up to date; (5) Maintain and update technical documents and procedures; and (5) Develop maintenance plans and upgrade schedules for the organisation's systems.

Database Management Unit

The unit manages the database in the organisation. The unit aims at ensuring effective and optimal performance of the database. Database is an organised collection of data, which are stored and accessed electronically from a computer system. The responsibilities of the unit also include (1) Ensure data security and assurance; (2) Ensure implementation of right configuration, designing and implementing database model based the organisation's requirements; and (3) Design and implement back-up and restore strategies.

Service Desk/Service Management

The unit manages incidents (service disruptions) and service requests, and handles all communication related to outages and planned changes to services. The responsibilities of the unit include (1) Monitoring of IT incidents and addressing users' request and questions; (2) Acts as a channel between other service management unit and the users; (3) Maintains third party support contacts, manages software licences and assist with system problem management; (4) Manages access to data (data access management); (5) Infrastructure and service monitoring and management; and (6) Manages systems integration during acquisition.

Research and Development (Innovation & Application Development)

The unit is responsible for researching, planning, developing and implementing applications that are required to meet business needs. The roles of the unit in the organisation (1) evaluating existing applications; (2) develop applications to meet business needs; (3) Implementing testing codes; (4) Documenting processes involved development of applications; (5) Testing of source code and code debugger.

Information Security unit

Information security is the protection of information and information system from unauthorised assess, use, modification, and disclosure. The information security unit ensures that confidentiality, availability and integrity of the information of the organisation is protected. The responsibilities of the unit include (1) Identifying vulnerabilities in the network; (2) Developing and implementing plans to secure the system network; (3) Keeping up to date with IT security standards; (4) Monitoring network to ensure compliance with security policies; and (5) Documenting security breaches and addressing the damages.

IT Strategy and Project management

The unit carries out a dual function within the organisation; it oversees IT strategy and IT projects. IT strategy sets the direction of IT functions. The unit also co-manages IT projects

within the organisation. The responsibilities of the unit include (1) Review and analyse current IT systems and processes; (2) Outline current and future IT projects; (3) Analyse IT strengths and weaknesses; and (4) Develop IT strategies that best align with business.

4.3 Overview of Southern Bank of Nigeria

As mentioned in chapter 3, Southern Bank of Nigeria (SBN) was used in the study as a second case. The bank was established over five decades ago. The organisation operates as a national bank and as such is only licenced to carry out banking business within Nigeria. The organisation also holds a universal banking licence from the Central Bank of Nigeria. A universal licence allows the bank to provide diverse financial and business advisory services to its clients and business partners as a one-stop shop. The organisation currently provides these services to over one million individuals, families and businesses across the country; helping the clients and business partners to achieve their personal and financial goals. The organisation's head office is situated in Lagos, Nigeria.

The organisation has a bank staff strength of over 1600 working in the head office and in the over 150 business offices and cash centres across the country. A third of the organisation's business offices are sited within Lagos; the biggest commercial city in the country. The organisation uses these business offices to promote its products and services to its customers. Products and services offered by the organisation to its clients and business partners include retail banking, SME banking, corporate banking, treasury, trade and financial advisory services to individuals, commercial, and corporate clientele. These services give opportunities to the customers to operate transactional accounts, savings accounts; to access loans and overdrafts; revolving credits; warehouse financing; letter of credit and invoicing, and discounting and receivable refinancing. Other products and services provided to support small and medium-sized enterprises are foreign exchange, cash management, retail management and integrated revenue services.

The personal business group offers products and services to individuals which are aimed at enhancing and supporting their everyday personal and business activities. The products and services provide opportunities for the customers to include different classes of accounts (current, savings and high network individual) and services such as fixed deposit, card, personal loans and e-banking services in their portfolios.

The business banking group focuses on the business customers. These business customers include corporate organisations such as the multinational companies, local large scale

manufacturing companies, telecommunication companies and other companies with high business turnover. The business products and services are offered to these customers by the corporate banking, trade, and electronic services.

The SME group provides banking solutions aimed at supporting the small and medium scale enterprises within the Nigeria market. The products and services offered by the group to the customers include different classes of business accounts, retail management services; e-banking solutions, SME loans and other services which are specified to the needs of the customers.

To effectively deliver these products and services, the organisation uses information systems and information technology solutions to support and enhance their service delivery. The bank is the first bank in the country to launch a fully digital banking platform that enables clients open an account with a seamless sign-up process using a mobile phone, personal computer and mobile tablets. The other electronic channels available to customers include over 360 ATMs, over 5700 point of sales terminals, smart mobile devices, the bank's website and virtual banking platform. Some of the solutions give the clients and business partners access to USSD services, SMS banking and other online services.

4.3.1 Organisational Structure

Below is the Southern Bank of Nigeria organisational structure.

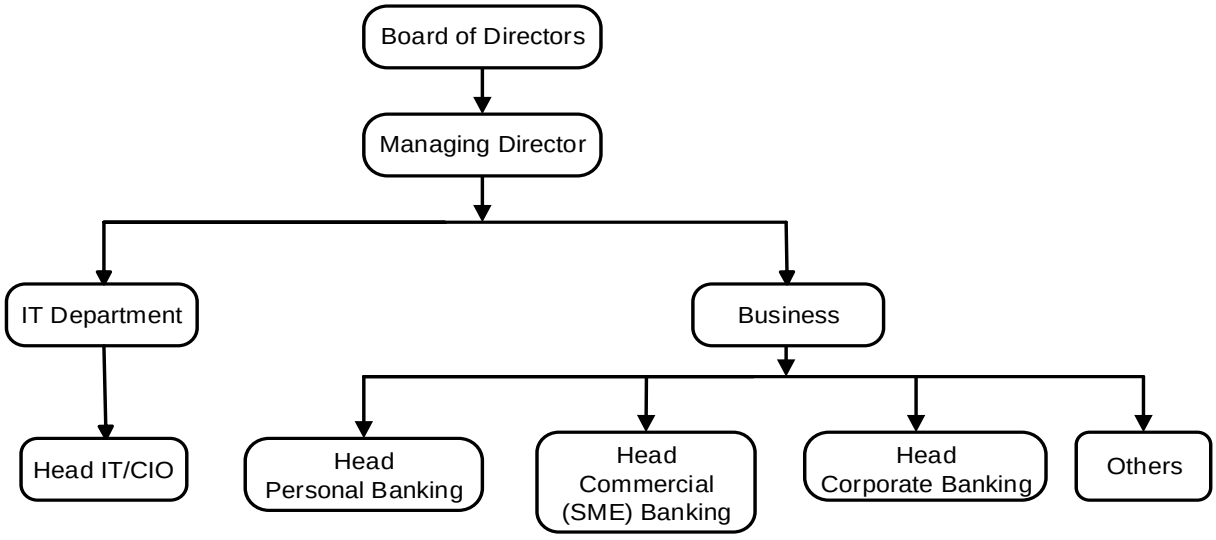

Figure 4.3: Organisational structure

The Southern Bank of Nigeria is managed and headed by the managing director. The managing director reports to the board of directors. The board of directors consist of the chairman and ten other directors. The directors consist of seven non-executive directors and four executive directors. The executive directors on the board are the managing director, the deputy managing director and two executive directors. The board of directors oversees the affairs of the organisation, including that of the executive management team. The executive management is headed by the managing director.

The managing director of Southern Bank of Nigeria is responsible for the daily activities of the organisation. This includes ensuring that the mission and vision of the organisation are achieved Within the bank, information technology supports the business. Business is made up of the retail, commercial, corporate banking and other support divisions. The other support divisions include the human capital, treasury, credit and risk, audit and control, financial control, and legal. The responsibilities of the managing director include (1) Report the state of affairs of the bank to the board of directors; (2) Manage the resources of the organisation which include human and other non-human resources; (3) Manage relationships with the bank's business partners; (4) Generate assets and liabilities for the bank; (5) Ensure compliance with regulations guiding the conduct of the business; (6) Ensure maximum productivity and performance at all times; (7) Perform other duties as assigned by the board of directors.

The MD supervises the activities of the business and IT divisions within the bank. The business division is made of four groups; the personal banking, the business banking; small and medium scale enterprises banking and the others. The others are the other units or departments within the organisation that support the business groups to achieve the organisation's goals and objectives. The other units include the treasury, financial control, audit and control; legal, corporate affairs; human capital management and general services.

The heads of the three business groups report to the managing director of the organisation. Their duties include updating the MD about the activities of their respective business groups, market analysis and updates, business direction, and challenges and requirements to address them. The roles and responsibilities of these business head include: (1) Develop and drive business strategies aimed at increasing the market share of their respective business targets; (2) Identify business opportunities; (3) Maintain and build business relationships with the organisation's clients and business partners; (4) Liaise with the other business groups and

business support to achieve business goals and objectives; (5) Direct business marketing activities and campaign; and (6) Grow the organisation's assets and liabilities.

The business support units which include the treasury, financial control, audit and control, legal, corporate affairs, human capital management, and general services provide services that are all aimed at enhancing the activities of business to achieve the organisation's goals and objectives competitively. The heads of these units report to the managing director of the organisation. Their responsibilities include updating the managing director on the state of affairs of their respective units. The heads of the units oversee the activities of their units and ensure that all resources required for the achievement of business goals and objectives are available.

4.3.2 IT Structure

Figure 4.4 below represents the structure of the IT department of the Southern Bank of Nigeria.

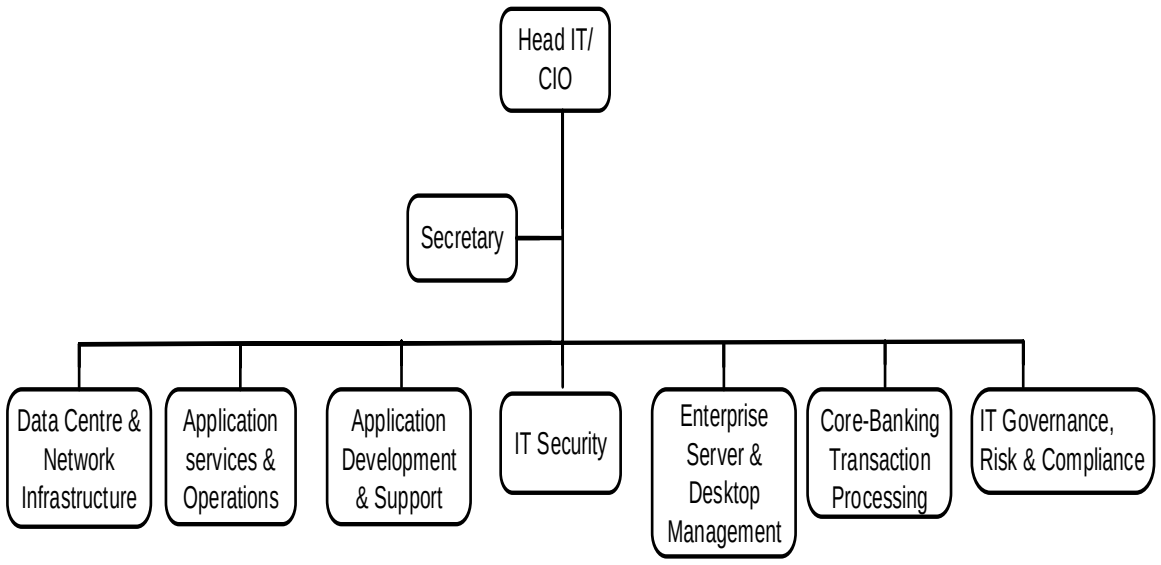

Figure 4.4: IT Structure

The IT structure is headed by the chief information officer/ Head IT. He oversees the activities of the different units that make up the IT department and reports directly to the managing director of the organisation. The duties of the CIO/Head IT include (1) Developing and implementing strategies for the IT department; (2) Aligning IT strategies with business objectives; (3) Plan and oversee the organisation's IT projects; (4) Manage the organisation's IT resources; (5) Develop and manage the departmental budgets; and (6) Hire the required skills to optimise IT resources performance.

As the head of the IT department, he supervises and leads the following units within his department: Data Centre and Network Infrastructure, Application Services and Operations, Application Development and Support, IT Governance, Risk & Compliance, Enterprise Servers and Desktops Management and Core-Banking Transactions Processing Unit. The roles of the units are as stated below.

Data Centre & Network Infrastructure Unit

The organisation's computing and networking equipment is concentrated in this unit for the purpose of gathering, storing, processing, distributing and allowing access to large amounts of data required for decision making. The roles of the unit include: (1) Carrying out scheduled and preventive system maintenance; (2) Developing and implementing IT policies; (3) Ensuring uptime maximisation; (4) Identifying and addressing the in-efficiencies in the system; (5) Monitoring local network, wide area network and data communication systems; (6) Doing backup on all systems; and (7) Troubleshooting computer systems /networks.

Application Services and Operations unit

The unit maintains business applications and related activities used by the organisation for the processes involved in the delivery of products and services. The roles of the unit include: (1) Incident management; (2) Applications' problems management; (3) Applications' events management; (4) Attending to users' requests; and (5) Access management.

Application Development and Support

The unit develops and supports the use of applications for business activities. The roles of the unit include: (1) Planning and designing business applications; (2) Developing and testing of applications; (3) Deployment of applications; (4) Reviewing existing applications; and (5) Troubleshooting and debugging applications.

IT Governance, Risk & Compliance Unit

The objective of this unit in the organisation is to ensure that IT strategies align with business goals and objectives. This unit manages the organisation's overall IT governance, enterprise risk, and ensures compliance with regulations. The unit's roles include: (1) Reviews IT practises; (2) Conducts investigations relating to IT practises; (3) Identifies potential risk; (4) Maintains regulatory knowledge; (5) Reviews and updates internal policies; and (6) Ensures adherence to regulatory policies governing IT activities in the financial industry.

Enterprise Servers and Desktops Management Unit

The unit oversees the activities of the enterprise servers and desktops. The unit handles all maintenance of servers and user's desktops. The roles of the unit include: (1) Monitoring the enterprise servers and desktops and apps running on them; (2) Checking the status, uptime and re-occurring issues on enterprise servers and desktops; (3) Updating the servers, desktops and the software installed on them; (4) Setup and configuration of software and services.

Core-Banking Transaction Processing Unit

The unit oversees the activities of the core-banking application (CBA) including its maintenance. The roles of the unit also include (1) Analyse and assess business needs and requirements; (2) Provide core-banking parameterisation; (3) Create new branches, products, modules, and features in the core banking system; (4) Support system upgrades; (5) Provide support during testing and implementation and activate all core banking peripheral applications such as ATM switch, loan/credit application, treasury application etc.; (5) Provide support to IT Help desk for CBA-related issues; and (6) Provide systems training and support to head office and branches.

4.4 Conclusion

Action Bank of Nigeria (ABN) and Southern Bank of Nigeria (SBN) are banking institutions providing banking services to their clients and business partners within Nigeria. Though ABN is a Nigerian banking institution, it however has business offices outside the country. The two institutions use information systems and information technology solutions to drive their business. This is to enable them to deliver quality and competitive services to their clients. The operations and technology resources deployed for business activities are different. Action Bank has a bigger banking operations and as such deploys more IT resources than Southern Bank of Nigeria. The aim of this approach was to understand how the relatively large and small size banking institutions identify, implement and use IS/IT solutions for their business activities. The background, organisational and information technology departments of both institutions was clearly presented in this chapter.

Chapter 5

Data Analysis

5.1 Introduction

The chapter presents the analysis of the data collected from two banking institutions in Nigeria used as cases in the study. The objectives of this study as stated in chapter 1 and 3 were to explore and understand how banking institutions in Nigeria select, implement, and evaluate information technology (IT) solutions' use for their business activities and processes. This includes identifying and examining the factors that affect the implementation and evaluation of the banking information system in Nigeria. Based on the findings from the data analysis, a framework was developed. The framework is intended to guide the evaluation of banking IT solutions within Nigerian banking institutions, which can also be useful in banking institutions of other developing countries with similar challenges.

For ease of flow and understanding, the chapter is divided into six main sections. The first section introduces the chapter, followed by an overview of the analysis. The third and fourth sections present the analysis of the two case studies. The fifth section discusses the findings.

5.2 Overview of data analysis

As presented in chapter 3, two banking institutions were used as cases in this study. The institutions are Action Bank of Nigeria (ABN) and Southern Bank of Nigeria (SBN). The same set of criteria was used to select the institutions and the participants. Also, the same guidelines were used to collect data from the institutions (organisations). The words 'institution' and 'organisation' are used interchangeably, but they do mean the same thing in the context of this study.

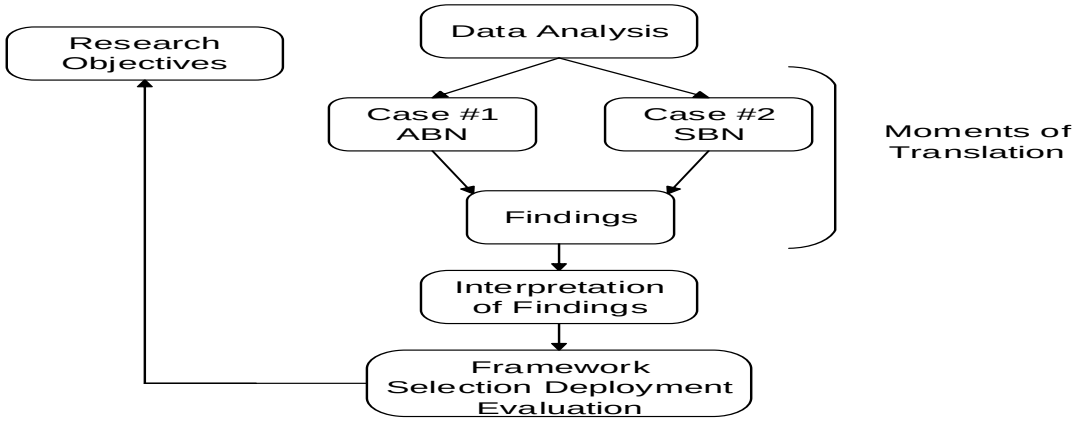

Figure 5.1: Overview of Data Analysis

As discussed in chapter 1 and 3, the actor-network theory (ANT) was employed to underpin the study. This means it was used as a lens to guide the analysis and interpretation of the findings. The four moments of translation as shown in Figure 5.1, was employed for the analysis of the data collected from the two cases studied, while the black-box was applied in the interpretation of the findings. The theory, including the four moments of translation and black-box, are comprehensively discussed in chapter 2. The analysis of the data was carried out on the individual case, separately. The findings were combined for interpretation purposes. Each of the analyses followed the same format, using the approach: actor, network, and moments of translation.

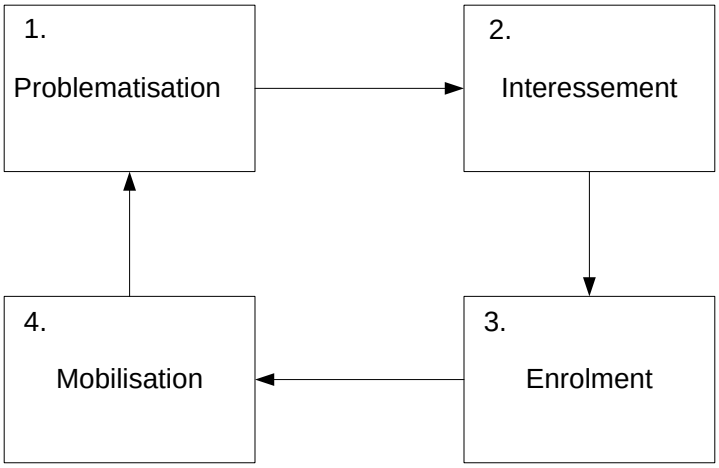

Figure 5.2: Moments of translation (Callon, 1986)

First, it was critical to establish the actors, which ANT defines as both human and non-human (Callon, 1986). This helps to follow the actors in their actions, which influenced the selection, implementation, and evaluation of IT solutions in the organisations. Secondly, it was crucial to understand the networks (groupings) that existed in the organisations. This was a vital aspect in gaining a deeper understanding of how decisions were made, and how IT solutions were applied by various groups to support processes and events, which draw on interactions and relationships. Thirdly, the moments of translation was employed. This helped to understand how the actors that are involved in the selection, implementation, evaluation, and use of IT solutions for banking purposes were chosen. This also includes gaining an understanding of factors that influence the selection, implementation and evaluation of the banking information systems.

5.3 Data analysis: Action Bank of Nigeria

As earlier discussed, the actor-network theory was employed as a lens for the data analysis. The moments of translation were used for the analysis of the data.

5.3.1 Actors

Actors are human and non-human entities that have the capacity to change a state of affairs (Muller & Schurr, 2016). Within ABN, both human and non-human actors come together to deliver the objectives of IT solutions. This includes the selection, evaluation, implementation and use of the IT solutions. The human actors come from both the business and IT divisions within the organisation. The human actors from IT include IT business analysts, managers and officers of the enterprise application support; database management; infrastructure; network and switching support; service management; research and development; information security; and IT strategy and project management units. The human actors from the business unit include the customers, the end-users, business office managers, divisional heads, managers and staff of the different departments/units and the members of the management committees within the organisation. These departments include foreign operations, treasury, control and compliance, credit risk, human capital resources, administration departments and ABN business services of the bank.

Other actors involved in the management of IT solutions in the organisation also include the approval authorities which include the members of the IT steering committee and the executive management committee; and the project management office. The non-human actors from IT include the governance frameworks, standards, processes, documentation, testing, test environments, evaluation sheets, questions, criteria, demo, proof of concepts and demo scripts. The non-human actors in business that are involved in the selection, evaluation, implementation and use of IT employed by the organisation include the processes, documentation, business strategies, feedback, testing and the different variety of the use of IT solutions.

In ABN, both the human and non-human actors are involved in the selection, evaluation, implementation activities and use of IT solutions. If any of the actors, whether the human or the non-human is removed from the network, then the function will be affected. That implies that neither the human nor non-human actors operate in a vacuum (Chitanana & Govender, 2018). Both the human and non-human work together and are considered to contribute equally in a network. A participant explained it this way:

> “So, at the end of that we would have probably come to a convincing conclusion with the various processes that we have followed are most likely getting us somewhere” (ABN05, 56:1774-1776).

5.3.2 Actor-Network

In ANT, networks consist of actors, which are both human and non-human with aligned interest to achieve a set goal (Tatnall & Gilding, 1999). Within the ABN, the various networks (group or unit) had a set of goals and deliverables. As at the time of this study, there were two main divisions; Business and IT in ABN, which have managers referred to as Divisional Heads. In addition to the business and IT division, there were the ABN business services, project management office, and the executive management.

The business division focuses on achieving business goals and objectives as set by the organisation, for profitability, relevance, competitiveness, and customer satisfaction purposes. Within the Business division of ABN, there were different networks that were involved in the processes and activities of the organisation. This includes the formulation of the business requirements and governance of activities, which form part of the criteria for selecting and evaluating IT solutions. Some of the units within the business division were end-users, business operations, audit control, financial control, and human resources. Each of the units has distinguished deliverables. Also, each of the units within the organisation has a head (team leader).

The business units follow processes, procedures, and policies in carrying out their mandates toward achieving the deliverables and providing services to clients. Also, the processes and procedures dictate the structure of how the activities, including the roles and responsibilities are executed. For example, the end-users identify a business need based on their interaction with the clients, which the managers escalate to the divisional head who seeks approval for the change to happen. As explained by a participant:

> “A business need is identified based on the negative feedback coming from business, either because they are unable to meet their customers’ request due to lack of capacity of an existing IT solution.” (ABN01, 5:130-132).

Based on the business requirements, goals and objectives, the IT division provides technology solutions. Similar to the business, the IT division was structured into various units. Some of the units included the enterprise application support; database

management; technology infrastructure and technology network; software development; information security; and quality assurance. The units played different roles in the selection, evaluation and implementation of IT solutions within the ABN.

The IT division has its own organisational structure, which is headed by the Chief Information Officer (CIO). The division is governed by the IT steering committee (ITSC), the highest decision-making body. The committee was responsible for the IT activities within the organisation which include IT strategy, operationalisation of IT solutions, and governance of IT solutions. The committee is comprised of the managing director, the executive directors, CIO, and other senior staff members. The ITSC committee is headed by an executive director in the organisation.

The ABN Services is a committee that is responsible for all procurement-related activities in the organisation. The committee comprises representatives from various units within the business and IT divisions. This makes some of the actors heterogenous in their actions, in that they replicate themselves in the groups (networks) within the organisation (Pham et al., 2016). One of the roles of the ABN Services is to coordinate the activities involved in the selection of IT solutions as well as the vendors' involvement in the organisation. This includes the management of the relationship between the organisation and the vendors.

To achieve their aims, business networks collaborate with other networks when selecting, evaluating and implementing IT solutions as explained by a participant:

> "So, basically, the selection is not done by one person, neither by the PMO nor by IT nor the users themselves. It is a combination of everything" (ABN05, 44: 1744-1745).

5.3.3 Moments of translation

Translation is a process by which a focal actor enrols other actors into an actor-network to achieve a set goal or common interest. Through the moments of translation, an activity is given a new meaning (Nehemia-Maletzky et al., 2018). In ANT, there are four moments of translation, which are problematisation, Interessement, mobilisation and enrolment (Johnson & Iyamu, 2019). Table 5.1 provides a summary of the analysis, using the four moments of translation. The detailed analysis is presented below.

Table 5.1: Moments of Translation: ABN

1. Problematisation	2. Interessement
In ABN, the selection, deployment and evaluation of IT solutions is problematised at three different levels in the organisation. The first level is where the business executives (managers) present their needs to the IT division. At the second level, the IT head (CIO) presents the business needs to his team, which is filtered to the individuals through the heads of the teams or units, in the final level.	The process of selection, deployment and evaluation of IT solutions is about a change to the activities of the organisation. The change interested different individuals and groups in both business and IT divisions. The interests are defined by their respective roles and responsibilities. The interests were shown in various ways, for different reasons.
4. Mobilisation	**3. Enrolment**
The business managers enlisted both management and IT. The management participation initiated the on-boarding of actors within the organisation whose participation was required to achieve business goals and objectives. These different groups, including the clients played assigned roles to make the change happen.	All the actors from both business and IT, management and other groups within the organisation that were interested or required, participated in the processes and activities involved in the selection and implementation of IT solutions. Also, the end users and other stakeholders (other business groups) were engaged by the IT Unit to gather the business requirements and expectations. These requirements form the basis for the selection of a solution to address business needs.

Moments of translation: Problematisation

As in many circumstances, change was constant in ABN, which enabled and supported using IT solutions. These solutions were initiated by different actors either within the business or IT division. Such action of initiation is what ANT refers to as problematisation. According to Effah (2012), problematisation is the phase where a focal actor defines the problem to potential actors.

Problematisation of IT solutions in ABN was informed or triggered by various reasons such as sustainability, competitiveness and profitability. These are not unique to the ABN. However, the organisation's approach draws significance. One of the interviewees simplifies the relevance of IT solutions in the organisation as follows:

> "IT solutions were highly considered as enabler to the business processes and activities. This selecting of applications (software) is a critical exercise and requires thoroughness" (ABN01, 1: 18-20).

In ABN, there were very rigid processes in both the business and IT divisions. This applies to all activities and events. As a result, the selection, and procurement of IT solutions followed a rigorous process, which was a bottom-up approach in that it starts with the end-users. The process of selecting IT solutions for organisation's purposes was based on business requirements, which were formulated or gathered by the end-users, and thereafter, escalated to the business manager. The business manager presents the requirements to the IT team headed by the CIO. One of the participants explained this as follows:

> "When IT gets the business requirements, we do a critical analysis of the requirements and of our environment, and available technology before we determine the specifications of required solution" (ABN01, 5:151-153).

In ABN, the CIO was responsible and accountable for all IT related activities in the organisation, which include review and analysis of business and technology requirements in defining and selecting IT solutions for business purposes. The CIO receives requirements from the business, which he passes to his team for analysis and translation into technology requirements. The outcome of these activities forms the basis for the determination and identification of an IT solution suitable for business processes and events.

By implication, the end-users have the power to shape requirements as they deem fit. This was also influenced by two other factors, interaction and knowledge. The interaction that happened between the actors was critical in that it helped to determine their collective understanding of the organisations' needs. Knowledge was also crucial in gaining a better understanding of needs, events, and services which were offered to both the clients and the business partners.

In ABN, the selection and deployment, including evaluation and support of IT solutions involves a team headed by the CIO. This means that he dictates and provides leadership on how the processes and activities are carried out in the organisation. The CIO's team consists of individuals who are heads of units, such as software development, technology network, risk, and security. When the need arises to select, deploy, evaluate or support IT solutions, the CIO presents the requirements to this team. The CIO presents the requirements to the team through different means; in the form of presentations, workshop, and sometimes via electronic mail (email). The means through which the CIO presents the requirements is determined by the nature of the task, which is volume, sensitivity and variety.

When the volume of the task is large and involves many units within the IT division, the CIO often presents the requirements in a workshop. This allows his team members to contribute their inputs for finalisation of the task. When the tasks are considered medium or small, the CIO prefers the use of email. This does not necessarily remove inclusivity through which inputs are gathered as in the workshops. The presentation of the task becomes exclusive only when it is sensitive to the business sustainability. For example, when ABN needed a treasury solution with a capability to process their treasury trades from end to end on a single platform. Hitherto, to successfully process a deal, they went through different processes on three different platforms. Due to the risk associated with the treasury operations, the business requirements were presented to the IT team exclusively. In addition, if the variety dictates wider audience, the presentation of the task is carried out through a workshop.

Moments of translation: Interessement

The second phase of the moments of translation is interessement (Callon, 1986). At this stage, interests are shown in the problematised item, which are the selection, deployment and evaluation of IT solutions. In ABN, the interests were shown at different levels and divisions (and units) of the organisation. This includes end-users' group, medium, and senior management in both business and IT divisions. Other groups that were interested in the IT solutions were the vendors and product owners. Some of the actors that were interested in the delivery of IT solutions included individuals such as software developers, network administrators, business, and IT managers.

The interests shown by different actors and various networks were based on either personal or organisational interest and purpose. Some of the personal interests were influenced by job security, career development or power to make a difference. For example, an employee's interest is based on the fact that he/she knew that certain activity could not be carried without him/her presence or involvement because of the stock of knowledge that he/she has gathered over the years. One of the employees explains this as follows:

> "The first thing we do is to get the subject matter experts; the people who have the experience and knowledge of the subject matter." (ABN02, 16: 485-486).

From the perspective of the organisation, individual employees and groups were interested in the selection and deployment or evaluation of IT solutions based on their roles and responsibilities. This means that the actors were contractually bound to be interested in the activities related to IT solutions. For example, the head of software development team had to

be interested in the selection and evaluation of software tools. The business manager's interest was based on his role and responsibilities in the organisation, which include getting the resources that are critical for achieving the business goals as set by the management. One of the interviewees explained:

> "When it is obvious that business requires a new system to address its challenges, then the group will write to the bank's management informing them of our need and justification for it" (ABN10, 103: 3224-3225).

The CIO and his team were interested based on their responsibilities in the bank which include the management and support of IT resources for generating business value. The CIO and his team are responsible for transforming business requirements to IT solutions. The presentation of the business requirements to IT triggered their interest. The interest of the management of ABN was triggered by their responsibilities which include supervising daily operations and providing resources required for business sustainability. The interest from the management perspective was triggered by the need to ensure resources required for daily activities and operations were made available. The interest of the IT steering committee was influenced by their role as the overseer of IT related activities which are aimed at generating business value. Their roles within the bank include overseeing the IT initiatives and budgets. The requirements from business are reviewed and approved by the committee before IT transforms them into technology solution.

In ABN, most of the processes and activities involved in product and service delivery are driven by IT solutions. The business process re-engineering unit is responsible for the analysis, improving, and managing processes involved in service delivery within the organisation. The interest of BPR was triggered by the need for appropriateness of processes involved in the delivery of services and products. Business processes and activities can be influenced by the IT solutions implemented.

In ABN, clients and business partners use IT solutions to carry out financial transactions for meeting their respective business needs. They interact with these IT solutions through a variety of channels deployed by the organisation. The selection and implementation of IT solutions interest the clients because they require effective IT solutions that can deliver quality services. Also, the feedback from the clients and business partners is critical for the determination of the IT solutions acquired. The interest of the end-users from the business division was difficult to

assess because of the varying nature across the organisation. This was explained by one of the interviewees:

> "The users may not see this new one adding any value to them. The difficulty in changing the current process may make them resist the change that the new one brings" (ABN05, 36:1117-1119).

Within ABN, the interests that were shown in IT solutions by individuals and groups were influenced by power. The sources of the power include the stock of knowledge acquired by individuals and contract agreement with the organisation. In the course of showing the various interests, a relationship was developed between the actors, which enabled them to interact and align their interest. Not all the actors that were interested participated in the activities of IT solutions in the organisation.

Moments of translation: Enrolment

Enrolment is the third stage of the moments of translation. This is the moment where human actor(s) accept tasks that have been defined and assigned to them by the focal actor (Shin, 2016). At this stage, actors enrolled (participated) in the processes and activities in the selection, deployment or evaluation of IT solutions. In ABN, enrolment was at different levels, which were at team, unit and divisional levels. As it was in the interessement stage, enrolment was influenced by various factors in the organisation. Some of the factors were obligatory, personal interest, and conceptual.

In the organisation, the selection, deployment and evaluation of IT solutions were based on certain factors, which were deemed critical for competitiveness, profitability, and sustainability purposes. Some of the factors were scalability, time-to-market (speed), functionality, reliability, and cost. Evaluation based on these factors required collectiveness, which means that various skilled personnel and different units were involved. Even though these factors were instrumental, there was external influence orchestrated by the central bank of the country. The external factor also influences the allocation of tasks within the organisation in that vendors were allowed to partake in some activities. One of the employees tried to explain how the process worked in achieving these tasks:

> "In the evaluation phrase, vendors come in and do presentations. If need be they are invited for demo or proof of concept" (ABN02, 16: 492-494).

In the IT division, tasks were assigned to units and teams, which in-turn, were allocated to individuals and groups, according to roles and responsibilities. However, there were often no pragmaticism in the process, which is also a challenge. The bigger challenge was that it was an unconscious action by the some of the actors. Hence some of the employees could not associate with the implications of the challenges.

There was no specific pattern or method through which tasks were allocated to units and employees in the organisation. This was fundamentally flawed in that some units and employees find it difficult to plan schedules and execute their tasks and responsibilities. Other two main serious challenges were that: (1) there were no dedicated teams in the execution of tasks, such as the assessment or evaluation of IT solutions; and (2) the focal (manager) seizes the prerogative to make decisions as pleases them in the allocation of tasks. One of the managers explains:

> "We get the initial business requirement document that was developed when the solution was acquired. After that we then constitute an assessment team which comprise the people that evaluated the solution when it was acquired" (ABN01, 7:199-202).

This method of allocation of tasks indicates the extent of power of the managers, which was considered unfair to some of the employees particularly because it was often not in their favour as compared to their colleagues. This type of power is enacted by the organisational structure, which includes the roles and responsibilities bestowed on the managers in ABN. The use of such power sometimes defines the relationship between the managers on one hand, and on another between managers and employees. Actor-network theory cautions against the use of power in a way that manifests into negativity (Callon, 1986). This is primarily because it can be detrimental to the network; in this case, the IT division and the organisation at large.

In ABN, some of the end-users were less interested in the processes and activities involved in IT selection and deployment. IT solutions changes often come with changes in processes and activities of the end-users. The users' resistance to change is influenced by various factors. These factors include lack of consultation and communication, fear of the unknown and threat to expertise or status. One of the participants explained as follows:

> “The users may not see this new one adding any value to them. The difficulty in changing the current process may make them resist the change that the new one brings” (ABN05, 36:1117-1119).

Resistance from employees triggers some managers to invoke clauses in their employment contracts. At this point, the employees have little or no room for negotiation in carrying out the tasks that have been assigned to them. In ANT, such a clause is referred to as obligatory passage point (OPP) (Law, & Callon, 1992).

There are some implications in the use of the OPP in an organisation. First, it is effective in getting tasks executed, on the positive front. Second, how the task is carried can be detrimental to the organisation. This is because the employee (or employees) are compelled to carry out the tasks. This raises the question of competence and quality of service delivery in the employment contract. Also, how are the contracts appraised? Some employees seem to explore the loophole as their source of power to act in the way that they do. For example, in the acquisition of a technology, employees are obligated to participate in the processes and activities of IT solution selection, deployment and evaluation in line with their employment contracts.

Performance appraisal is critical in employees’ participation in the selection, deployment, or evaluation of IT solutions in the organisation. This can be implemented only through policy and metrics.

The business requirements formed the basis for developing the criteria used in the selection of IT solutions. The business and IT units’ participation in the selection stage was mandatory and in pursuance to their responsibilities in the organisation. These responsibilities include meeting business requirements and needs. In ABN, the processes and activities were challenged by several factors which can be classified into internal and external. The internal factors include inadequate business requirements gathering and insufficient business requirements scoping. The external factors include management and regulatory influences. This is as explained by one of the participants:

> “There are some applications that you are doing today, that Central bank of Nigeria already has recommended” (ABN01, 11: 352-353).

In ABN, some senior management staff interfere in IT solutions selection processes and activities. This is to ensure that a particular vendor is selected. On the regulatory front, the

regulator recommends the IT solutions vendors to engage based on their relationship, sensitivity of processes, and the vendors' competence.

Moments of translation: Mobilisation

Mobilisation is the fourth and final stage of moments of translation. This is the stage where actors in a network accept and act together in pursuance of a common goal or interest (Shim & Shin, 2016). In ABN, the common goal or interest was to successfully deliver effective IT solutions and conduct evaluation, continually, that could address the business requirements and needs. The primary purpose of evaluation was to detect early deficiencies and draw the attention of the business division and other stakeholders. Thus, two things happen in the process: (1) there is a spokesperson who mobilises for the evaluation to be conducted; and (2) there is a spokesperson who mobilises for the deficiencies that were detected to be addressed.

Each division, unit or team had a spokesperson, either nominated by virtue of the role or position, or the individual was self-appointed. Also, mobilisation was at both strategic and operational levels in the organisation. In addition, mobilisation was for various reasons within the IT division of the ABN. This includes the justification of IT solutions' deployment, audit clearance from evaluation, and purported service delivery improvement. In ABN, mobilisation happened at different levels of networks, such as team, unit, and division.

The CIO was the official (nominated) spokesperson for the IT division at the strategic level. He mobilises the executive management team to buy-in and support the activities of the IT division. In doing so, he achieves his deliverables as set out in his performance contract. Also, the mobilisation of stakeholders for buy-in into IT solutions' selection, deployment, and evaluation was intended to solicit for more financial support in carrying out related activities. The CIO focuses on the executive management primarily because of the authority vested in the team. The management team had the absolute power to approve or decline requests in the organisation.

At the operational levels, each team or unit had spokespersons, which were the delegated individuals to represent the groups (or networks) in meetings where IT solutions were discussed, either for selection, deployment or evaluation purposes. The responsibility of the spokespersons was to ensure that other teams and units concur with their initiatives, approaches and deliverables. Through such an agreement or buy-in the teams were able to

get their budgets approved and have a sense of relevance and attainment of job security in the organisation.

However, mobilisation was not always a smooth ride or process in either the strategic or operational level. The spokespersons were challenged by both human and technical factors. The human factors manifested from challenging relationships and interaction between actors, as some of the employees struggled for recognition and power. This sometimes results in the division of ideology, in the efforts to represent the organisation's interest and goal. From the perspective of technical factors, some spokespersons were challenged with ability and knowledgeability, which affected the selection, deployment or evaluation of some IT solutions. In turn, some spokespersons struggled to mobilise their colleagues and other stakeholders because they were not convinced if they had the 'right' or appropriate product (IT solution) or delivery of quality services.

5.4 Data analysis: Southern Bank of Nigeria

The second case is the Southern Bank of Nigeria (SBN). The actor-network theory was also employed in the analysis of data collected from the organisation. In the use of ANT as a lens, the analysis began with the identification of actors and actor-networks. Thereafter, the four moments of translation were employed.

5.4.1 Actors

As already established, actors are entities that have the capability to make a difference, which can be human or non-human (Latour, 2005). In the selection, deployment and evaluation of IT solutions, humans did not carry out tasks in a vacuum. There were non-humans which enabled human activities. Also, the actors were from both the IT and business divisions of the organisation.

The human actors from the IT division included the software developers, network administrators, business analysts and IT managers. From the business division, the human actors included the end-users, business office managers, divisional managers and the members of the executive management of the organisation. These actors employed or interacted with processes, rules, policies, and technologies known as non-human actors, in the course of selecting, deploying and evaluating IT solutions on behalf of the organisation.

Within the IT environment (or division), the non-human actors included documentation, standards, processes, governance frameworks, testing tools, test environments, evaluation sheets, criteria, and technology demos. From the business perspective, some of the non-human actors that were involved in the activities of selection, deployment, and evaluation of IT solutions included the processes, documentation, business strategies, feedback, and end-users' testing guidelines.

The IT personnel needed the business people in order to formulate the requirements for the selection, deployment purpose and evaluation of IT solutions. Also, the humans required some non-human factors such as process, requirements, standards to guide eligibility and appropriateness in the selection, deployment, and evaluation of IT solutions in the organisation. This means that humans could not do or operate without the non-humans in the process of fulfilling their tasks in this context. The separability between human and non-human actors is well explained by ANT in its asymmetry notion. According to Bengtsson & Agerfalk (2016), it is the inseparability that leads to conscious or unconscious creation of networks. In the organisation, the human and non-human actors from both the business and IT units worked together to deliver the organisation's goals and objectives. This included participation in the processes and activities involved in the selection, deployment and evaluation of IT solutions. The participation of the actors (human and non-human) was critical, as the organisation's goals and objectives cannot be delivered independently by either the human or the non-human actors alone. This significance of the relationship was explained by one of the participants as follows:

> "A proof of concept (POC) and the users' hands-on will enable the bank see how the IT solution actually works in our environment" (SBN02 ,17:557-558).

5.4.2 Actor-Network

In ANT, network exists because there are actors (Thissen & Twaalfoven, 2001) and actors coexist because they have a common interest (Law, 1999). Also, as mentioned above, networks are created consciously or unconsciously. In SBN, there were many networks known and referred to as divisions, teams or units. The networks were consciously created based on the organisational structure and policy. However, there were some networks that were unconsciously created, which were informed by different factors such as work collaboration, employees' longevity, and social friends.

There were two main networks (groups); the business and IT divisions as of the time of the study. Both groups had a separate set goals and objectives. The business and IT groups' activities were managed by the head of business and the chief information officer (CIO) respectively. In addition to the two main groups (networks), the other networks that existed in the organisation included the project office and the executive management.

In SBN, the business division had defined roles and responsibilities. These responsibilities include meeting the clients and business partners' requirements. This was aimed at enhancing sustainability, profitability and competitiveness of the organisation. In addition, the group was also responsible for generating the business requirements essential for the selection and deployment of appropriate IT solutions to meet the clients' needs. Appropriate IT solution is critical for the enhancement of product and service delivery. The business group consist of individual (end-users), teams and managers from the different departments that make up the business group. These departments included the business operations, treasury, financial control, and credit and risk.

The IT group was headed by the chief information officer (CIO). He and his team were responsible for the IT activities within the organisation. The IT group's activities included the management and support of IT solutions. These activities are vital for meeting business goals and objectives. Also, the group was responsible for transforming the business requirements presented into IT solutions. The IT group consisted of individuals, team leaders, unit managers from the different IT units. The IT units include Application Development and Support, IT Governance, Risk & Compliance, Enterprise Servers and Desktops Management, and Core-Banking Transaction Processing Unit. The activities of the IT division were overseen by the information steering committee (ITSC) of the organisation. A respondent explained the role of IT in the selection, deployment and evaluation process and activities.

> "When every stakeholder to the solution have generated their requirements, the list is then sent to the IT division. The division conducts technical analysis based on which it is translated into system requirements" (SBN01, 5:153-155).

In SBN, there were two executive committees; the executive management and information technology steering committee. The executive management committee is the highest decision making and approval authority in the organisation. All the business initiatives and technology change initiatives within the organisation required the authority of the committee. The committee is headed by the managing director, and other members included the executive

directors and five other senior executive staff of the organisation. The information steering committee oversees all IT-related activities, including the budgeting, project implementation, governance, and management. All technology change processes and activities within the organisation must be approved by the committee. The committee is headed by an executive director. The other members of the committee included the managing director, the CIO and other senior management staff. A participant explained the duties of the steering committee as follows:

> "The IT steering committee oversees IT initiatives including budgeting and assessment of potential risks. The committee was headed by an executive director. The MD was also a member of the committee." (SBN01, 1:31-33).

In SBN, all business and IT initiatives were project managed. The project office was responsible for the management of all initiatives, end to end. The department was headed by the office manager. The responsibilities of the project office included projects implementation oversight, vendor and business relationship management. This also included managing the processes and activities involved in the selection and deployment of IT solutions used for meeting business needs. The department is made up of different units that are specialised in the management of different aspects of business and IT initiatives. The department consisted of individuals, teams and unit managers who drove the unit's activities. A participant explained the importance of the unit as follows:

> "Project management is their area of core competence. The office has personnel with the skills required to effectively manage projects. All projects within the bank go through the department" (SBN02, 17: 586-588).

5.4.3 Moments of translation

There are four moments of translation; problematisation; interessement, enrolment and mobilisation (Lee & Wang, 2016). These moments allow and enable the shifting and transformation of activities from one stage to another, and in the process, negotiation and participations happen. The activities as they happen in the selection, deployment and evaluation of IT solutions in the organisations are first summarised, as presented in Table 5.2. Thereafter, the analysis is presented. Thus, it is important to read the analysis in conjunction with the Table in order to gain a better understanding.

Table 5.2: Moments of Translation: SBN

1. Problematisation	2. Interessement
Inevitably, IT solutions were always problematised in the organisation. This was done at three different stages. At the first level, the business' end-users present a set of requirements. The requirements are collated and presented to the CIO at the second level. Finally, the CIO presents the requirements to his team for action.	Business and IT employees including managers have vested interests in the selection, deployment and evaluations of IT solutions in the organisation. However, their interests differ, which revealed based on individuals and groups' actions. The various interests are shaped and influenced by different factors such as power-to-own and organisation's responsibility and professional ethics and accountability.
4. Mobilisation	3. Enrolment
The end result (or product) from each activity of the IT solutions was always reported to the stakeholders. This was often done officially. However, some IT personnel did blow their trumpets in some instances. The presentation of the reports followed the organisational structure of communication and information sharing. The primary aim was to mobilise stakeholders to buy into the solution's outcome.	At this stage, it was clear that not all actors that were interested participated in the activities of the IT solutions. Employees' participated in accordance with tasks allocation, which were defined and shaped by factors such as accountability, responsibilities and know-how. This entails IT managers using their discretion and power bestowed on the positions that they held.

Moments of translation: Problematisation

In the last five years, the Southern Bank of Nigeria (SBN) has considerably invested in IT solutions. The investments in IT solutions were to support their growing business network, which was critical for their competitiveness, sustainability and profitability. The implementation of the solutions was more about change in fulfilling the rapidly changing needs of clients and partners, including environmental factors. To initiate change is considered as problematisation in ANT. Xu et al. (2018) describe such an action as a moment where a focal actor identifies and defines a problem to other potential actors.

In SBN, there were established processes followed in carrying out such an action (of problematisation) in the selection, deployment and evaluation of IT solutions. The approach followed was vital in achieving business goal and objectives. The processes and activities began in the business division. In a specific case, the deployment of a Virtual Banking Application (VBA), the end-users from the business generated the requirements which were presented to the business manager. The business manager as required by official obligation presented the requirements of the VBA to the CIO and his team. The approach followed

was the bottom-up approach. The significance of the approach was explained by one of the respondents as follows;

> "The business requirements which were generated by the end-users formed the basis for the criteria that were used in the selection and evaluation of the IT solutions" (SBN04, 64:2147-2149).

The requirements gathered by the end users were critical in that they define and influence the selection, deployment and evaluation of IT solutions for the organisation's purposes. The significance of the end users' actions was that they had the power to shape the IT solutions as deemed fit. In addition, the approach used gave the users a sense of ownership which influenced their commitments. The outcome of the users' activities was influenced by three factors; commitment, knowledge and interaction. These factors were key to better understand the business needs.

The CIO as the head of IT was responsible for the management and implementation of IT solutions. This included gathering systems' requirements significant for meeting business requirements. As obligated by his position, the CIO received the requirements from the business manager. In turn, the CIO presented the requirements to his team for analysis and transformation to systems' requirements. The systems' requirements were critical for the selection and deployment of the IT solutions. A respondent explained the importance of the approach followed.

> "The process is perfect because it is based on standard and standard guides practice. When implemented to the letter the desired result will manifest" (SBN01, 16: 530-531).

The CIO further assigns (problematises) the requirements he receives from the business (end-users) to the members of his team (direct reporting line). The teams consist of individuals, teams and managers from the different units of IT. The units included the Applications Development and Support, Network Infrastructure, Application Services and Operations, IT Governance, and Core-Banking Transaction Processing Unit. In the IT division, the presentation of the requirements took different forms, depending on the nature of the requirements. The form of presentation was influenced by the volume, variety and sensitivity of the requirements.

The CIO adopted the group meeting approach during the presentation of the core-banking applications' requirements. This was due to the volume of processes and dependencies required to be considered before the selection of a newer version. This mode of presentation was to enable inclusivity and wide-ranging input from the different units. One of the respondents explained as followed;

> "The processes and activities involved in terms of changing core-banking solution is enormous. This was because there were a whole lot of dependencies that had to be considered. IT had to cater for all those dependencies and identify the key stakeholders to make that project a success" (SBN01,3: 99-101).

When the volume of tasks was small or medium volume, the presentation was done via the office intra-mail. This approach does not remove the inclusivity and commitment to the task. This was because there were set deadlines for the completion of the task. Non-adherence to the deadlines were sanctionable. The presentation of the task was exclusive when the requirements were sensitive to the business' sustainability. For example, when the Information system control unit problematised the prevalence of fraudulent activities on clients' accounts. Because of the sensitivity of the activities involved, which also bordered on customer accounts' security, the CIO presented the requirements to his team exclusively. The mode of presentation is vital for understanding the business requirements, clarity of purpose, inclusiveness and in-put gathering.

Moments of translation: Interessement

Each time an activity about selection, deployment or evaluation of IT solution was initiated (problematised) in the organisation, the focal actor assigned tasks and responsibilities to other employees. This is a situation which Twum-Darko et al. (2015) describe from the perspective of interessement, that the focal actor locks in other actors in the activities which he or she has proposed. At this stage, the actors start changing their affiliation to form actor-network(s) and align their interests with that of the focal actors. In SBN, the interests in the processes and activities involved in the selection, deployment or evaluation of IT solutions manifested at different levels. For example, in the deployment of the Virtual Banking Application (software), the interessement began at the ender users' level, then progressed to the middle level (unit managers) and finally moved to the senior management level. Interest was shown by both individuals and groups in both business and IT, in the change of activities, and deployment of the Virtual Banking Application (VBA). The other groups that were interested included the vendors, product owners, and consultants.

Within the organisation, the interest of individuals and groups was motivated by either personal or organisational purpose. On the personal front, some of the factors that influenced their interest included the desire for recognition, power to control activities, and knowledge to excel. Some of the individuals who were interested in the selection, deployment, or evaluation of the VBA included the customers' relationship, banking transaction, application support, desktop management and core-banking transaction processing officers (employees). These were the frontline officers that directly interacted with the customers on a daily basis. For example, an application support officer who is ambitious and has knowledge was bound to show their interest in the change activities related to application selection and deployment, as this would give them the opportunity to demonstrate their competence and relevance.

In SBN, different units showed their interest in the processes and activities involved in the selection, deployment and evaluation of IT solutions based on the fact that it gave them an opportunity to let the management know about the processes that hindered the effectiveness of their services. The expression of their interest in the activities gave them the opportunity to display their knowledge of the processes and abilities to improve them and their services. Some of the groups who showed interest in the change activities related to the Virtual Banking Application included the branch operations, foreign trade services, treasury, and credit and marketing units. The interest of some of the business units triggered the interest of the individuals and teams with IT supporting the IT solutions. IT units that showed interest included the Application Services and Operations, Desktop Management, Data Centre, Network Infrastructure Centre, Infrastructure, and Core-Banking Transaction Processing Units

On the organisational front, interessement was influenced by obligatory individuals and groups' roles and responsibilities. In line with their contracts, individuals and groups within the organisation were obligated to be interested in activities related to their purposes. For example, a network administrator was bound to be interested in the selection and evaluation activities of network infrastructures. In business, the end users were obligated to be interested, as it was their duty to provide services, interface, and receive feedback from the clients. The feedback coming from their interactions (interfaces) with the clients formed the basis of business needs and subsequently, the requirements. One of the participants explained the importance of feedback coming from the ender users.

> "The users' feedback is important for the selection or development of IT systems that are required to meet business goals and objectives" (SBN06, 66;2204-2206).

The interest of the business manager was based on his position and responsibility in the organisation. It was his responsibility to drive business goals and objectives. For example, the business manager had to be interested in the bulk e-mail solution's proposal. This was because it was within their purview of duty to ensure that customers received their statement of accounts monthly and regularly. Meeting business needs and requirements was one of the business manager's core mandates. The CIO and their team's interest was activated by their obligatory duties in the organisation. The CIO's and their team were responsible for IT resources in the organisation, including its management and security. It was also their responsibility to receive, analyse and transform business requirements into technology solutions. The executive management's interessement was based on their expectations as defined by the board of the organisation. Their purposes included overseeing the daily operational activities of the organisation to ensure that its goals and objectives are achieved. This was with the aim of enhancing competitiveness, profitability and sustainability.

The interest of the IT steering committee was triggered by their oversight mandate of all IT-related activities which included IT initiatives, management, governance and budgets. All initiatives go through the committee. The other groups that showed interest in the processes and activities involved in the selection, deployment and evaluation of IT solutions within the organisation were the business processing re-engineering unit (BPR) and project management office (PMO). The adoption of IT solutions had impact on business processes and activities. The BPR manages change processes and impact. As a policy in SBN, the project management office manages all the initiatives in the organisation, including vendor management. All change initiatives within the organisation interest the group. One of the participants explained the role of the project office.

> "All change initiatives within the bank must pass through the project management office. They are the co-ordinator and manager of all the change initiatives in the organisation" (ABN02, 18: 579-581).

After the interessement phase, then actors were enrolled to participate in the processes, activities and events, in pursuance of their common interest. However not all the entities who showed interest were enrolled.

Moments of translation: Enrolment

Not every individual and group that showed interest in the Virtual Banking Application, bulk email and other IT solutions participated in the actual selection, deployment, or evaluation

activities. In ANT, the art of participation is referred to as enrolment, which Holstrom and Robey (2005) describe as a moment where actors accept the tasks, roles and responsibilities that have been defined and assigned to them by the focal actor. The allocation of tasks, roles and responsibilities in the selection, deployment or evaluation of IT solutions were influenced or dictated by various factors, such as the power bestowed on the focal actor, skill-set, and organisational structure.

The enrolment happened at three main different levels within the organisation's structure. It began at the end user's level, where some of the users assisted in gathering the business requirements for the solution (such as the Virtual Banking Application). The participation of the technical experts was the second level. Those with technical expertise and experiences were selected. Finally, some senior management took part in the management of the process, approval of the financial budget, and lobbying their executive colleagues to buy into the initiative. One of the participants explains the significance of the approach followed in the organisation.

> "The processes followed in the selection and evaluation of IT solutions is of significance. This was because it allowed the users and other stakeholders to participate in the selection process" (SBN04 .51:1721-1722).

The three levels of enrolment as described above made the processes and activities that were involved in the selection, deployment and evaluation of IT solutions rigorous. Also, this could be attributed to the fact that the selection and evaluation of IT solutions were based on certain streamlined factors, which were considered sacrosanct and required to enhance the effectiveness of the IT solutions that were deployed in the organisation. This was with the aim of ensuring their competitiveness, profitability and sustainability. The factors included functionality, scalability, reliability, speed, support and cost of IT solutions. Different skills (actors) were required to carry out evaluation, to ensure the effectiveness of the use of IT solution. Some of the actors enrolled to carry out the evaluation included software developers, systems analysts and IT administrators.

In SBN, the enrolment of the individuals and teams who participated in the evaluation activities was random. This was due to the fact that the organisation did not have a dedicated evaluation team. The absence of a dedicated evaluation team implied that there was no framework guiding the processes involved in the evaluation of the IT solutions. The organisation was often

reactive, meaning that events often happened before detected and resolved. One of the participants explained how evaluations were carried out in the organisation.

> "There is no established evaluation process in the bank. The only form of evaluation that happens is an IT audit. Though there is a department called IS control, they also do like a review but it is not on a deeper scale like that of the IT audit" (SBN02, 27:897-899).

The implication of this was that the activities related to evaluation of IT solutions were inconsistent. In addition, this approach also left room for IT managers to assign tasks, roles and responsibilities as desired. The CIO and unit managers had the absolute power to assign roles as desired. In ANT, though, power can be the catalyst for the acceptance of obligatory passage point (OPP). In ANT, OPP is the point other actors must go through to get into the network (Walton, 2013). However, the use of power may be counter-productive (Twum-Darko & Harker, 2017). The incoherent assignment of roles can provide a basis for illicit practices and conflict of interest.

In business, the end-users' group participation was mandatory, based on their roles and responsibilities in the organisation. These actors use IT solutions to deliver services to the clients and business partners. This placed them in the best position to gather the necessary requirements critical for the selection, deployment and evaluation of IT solutions. They are the first level of contact between the clients and the organisation. One of the participants explained the significance of the end-users' participation.

> "The ender-users gathered the requirements to ensure that the IT system to be deployed addresses our business needs. Also, to ensure the system is robust and scalable to cater for future business needs of the organisation" (SBN09, 86:2940-2941).

The end-user's group included the team leader who collated the requirements. The team leader then presented the requirements to the business manager. Also, business the manager's participation was mandatory. Their responsibility included ensuring that the business requirements aligned with the business goals and objectives. They received the requirements and then called for a group meeting, where the requirements were reviewed and re-validated. Based on the review and re-validation, the business manager presented the business requirements to the CIO.

The enrolment of the CIO was also statutory. This was because they and their teams are responsible for all IT activities within the organisation. It was their duty to oversee the selection, deployment, evaluation, management and support of technology in the organisation. In addition, the group was responsible for the transformation of business requirements into system requirements and subsequently to technology solutions. In the processes and activities that followed, the CIO received the business requirements from the Business Manager who then presented the requirements to the team for analysis and development of system requirements. The system requirements were critical for the selection, deployment and evaluation of IT solutions. The CIO assigned the task to the team as deemed fit. The process followed in the IT group was explained by one of the participants.

> "When the business requirements got to IT department, we did an analysis of the requirements and its expected implication on the existing infrastructure of the system. After that we come with the systems requirements" (SBN01, 4: 107-109).

The outcome of the analysis is dependent on certain factors; information and knowledge. The objective of the processes and activities of selection and evaluation become challenging when the requirements are not adequately analysed, based on the lack of adequate information or improper definition, as explained by one of the participants.

> "Basically, the major challenge in selection and evaluation is actually with our requirement definitions. This is where things go wrong" (SBN02 ,22:739-740).

The implication of this is that system requirements will not align with the actual business needs. This will result in the selection of an IT solution that will not address the business needs of the organisation.

The other groups that were enrolled in the selection, deployment, or evaluation activities included external entities such as software vendors, business processing re-engineering (BPR) unit, executive management, the project office and vendors, and the original equipment manufacturers (OEM). A change in technology comes with changes in business processes. The BPR was enrolled to review change in processes and impact. This was a standard procedure in the organisation. Within the organisation, the project office was responsible for vendor management. Based on their roles and responsibilities, the unit participated in the activities related to the selection, deployment and evaluation of IT solutions. The vendors were mainly to convince the employees, including the technical staff and senior managers, about the significance of their products (software). This was often done through the presentation and

demonstration of their IT solutions. Also, the vendor's activities were guided by another external entity, which was the Central Bank of Nigeria. One of the participants explained how the use of IT solutions sometimes came about.

> "The introduction, adoption and use of NIBSS, Form M single window platform and the export processing platform was mandated by Central Bank of Nigeria. This was to bring uniformity and efficiency into the system" (SBN10, 90: 3025-3026).

In SBN, the processes and activities followed in the selection, deployment and evaluation of IT solutions were consequential. However, there were gaps in the approach followed. The gaps included: (1) Lack of a dedicated team responsible for the evaluation of the IT solution in use; (2) There was no established procedure or strategy followed in the allocation of responsibilities and execution of processes and activities; and (3) The selection of skill set who carried out some of the activities was at the discretion of the CIO and the unit managers. The implication was that decisions were incoherent and unplanned. This affects the staff's attitude to assigned duties. Secondly, the managers' power to dictate the direction of activities and events sometimes defined the relationship and harmony with the actor-networks. This can be detrimental to the IT and organisation's goal and objectives.

This could result in disgruntlement in staff that were not selected to participate. The quality of work of the disgruntled staff may be affected and as such have negative impact on business goals and objectives. The approach followed, though rigid, has some flaws. Roles and responsibilities also played a significant role in the processes and activities in the selection, deployment and evaluation of IT solutions in the organisation.

Moments of translation: Mobilisation

At this stage, spokespersons emerged to speak on behalf of the passive actors (Shim & Shin, 2019). To mobilise is an effort and mechanism to convince audiences and interested parties, including enrolled entities, to buy-in or accept the outcome of an activity (common interest). In SBN, the common interest was to select and deploy functional and reliable IT solutions to fulfil business needs and objectives. This was with the aim of ensuring that the organisation's increasing competitiveness, profitability and sustainability in Nigeria was maintained.

In each activity, there can be more than one focal actor who mobilise others. The focal actors who mobilised the other actors into participating were both from the business and IT divisions. Those mobilised included individuals and groups within the two main

divisions. In the process of mobilisation, different spokespersons emerged at different levels, all speaking and acting in the interest of their respective constituencies, which include software development, network administration, business analysis, and technical support.

In business, though negotiations and interactions happened at the different levels, the spokespersons at the different levels (lower and middle) reported to the business manager. Meetings were held where the business needs and requirements were discussed and differences were resolved. The business manager was the focal actor and spokesman for the business group as mandated by his position and responsibilities. He spoke for the group and ensured that the group's interest which was to meet business needs and requirements were presented to IT and the other stakeholders for resolution. This was with the aim of ensuring that IT solutions appropriate for the achievements of business objectives were delivered to the division.

In the IT, the CIO was the focal actor and spokesman as mandated by his position. Though, in similarity to the business, different spokespersons emerged at different levels within the group. The spokespersons at the lower and middle level within the group reported to the CIO. The unresolved issues were often presented at the group's meetings for review and resolution. These meetings were with the aim of developing IT strategies that aligned with the business strategies, and generating system requirements, based on which IT solutions were selected, deployed and evaluated. The system requirements formed the basis for the selection, deployment and evaluation of the IT solution used.

The two main focal actors (spokespersons) at the operational level were the business managers and CIO. At the strategic level, the CIO became the spokesman for the alliance by presenting the requirements to the executive management. This was in line with his official roles and responsibilities. The onus was on the CIO to present to the management of the organisation the plans, strategies and requirements that are needed to achieve the organisation's goals and objectives. His ability to convince the management is of essence for budget approval and mobilisation of the other stakeholders whose participation was critical for the successful selection, deployment or evaluation of IT solutions. The system requirements presented to the management formed the basis for the consistent evaluation of IT solutions selected and deployed.

In SBN, the emergence of spokespersons at the different levels was based on two factors: first, it was the roles and responsibilities which span from the organisational structure; and second was the knowledge and expertise of some individuals that enabled them to speak about entities. At the operational level, there were two focal actors; the business and IT managers who mobilised the other actors in their respective groups to participate. At the strategic level, the CIO became the spokesperson for the alliance.

The spokespersons at the different levels were challenged by both human and technical factors. The human factors manifested in the form of personal interest and quest for power such as the desire for recognition and growth at the lower and middle levels. This often resulted in the disruption of work flow, decreased productivity and project failure. On the technical front, knowledge was of significance. Inadequate knowledge often resulted in inappropriate requirements definition and scoping. The selection of inappropriate IT solutions leads to the non-alignment of business/IT goals and objectives.

5.5 Conclusion

The chapter presented the analysis of the data collected from the cases studied. The analysis of the data was carried out separately using the actor-network theory. The moment of translations from ANT's perspective was applied for the analysis of data of both cases.

The next chapter presents the findings and interpretations of the findings.

Chapter 6
Findings and interpretation

6.1 Introduction

The chapter presents the findings and the interpretation of the findings. The findings are based on the analysis of empirical data collected from the two banking institutions used as case studies; Action Bank of Nigeria and Southern Bank of Nigeria. The Chapter also presents the interpretation of the findings. Based on the interpretation of the findings derived from the analysis of data gathered from the two cases, a framework for evaluating banking information systems in Nigeria was developed (figure 6.4).

The chapter is divided into five sections. The first section is the introduction. The second and third sections present the findings from the analysis of data of Action Bank of Nigeria and Southern Bank of Nigeria, respectively. The fourth section presents the framework for the evaluation of banking information systems in Nigeria that was developed based on the interpretation of findings from the two banks used as cases in the study. The fifth section presents the conclusion of the chapter.

6.2 Action Bank of Nigeria: Discussion of the Findings

As discussed in chapter 5, the moments of translation from the perspective of ANT was employed in the analysis of the data collected from ABN, one of the organisations used in the study. Based on the data analysis presented in the above section, six factors were found to influence the selection, deployment and evaluation of IT solutions in ABN. The factors are (1) Requirements; (2) Alignment; (3) Process-oriented; (4) Random approach; (5) Scalability and reliability; and (6) Stock of knowledge. As shown in Figure 5.3, the factors do not operate in a vacuum; they are connected with each other. The discussion that follows should be read with the Figure in order to gain a better understanding on how the factors influence the selection, deployment and evaluation of IT solutions in the organisation.

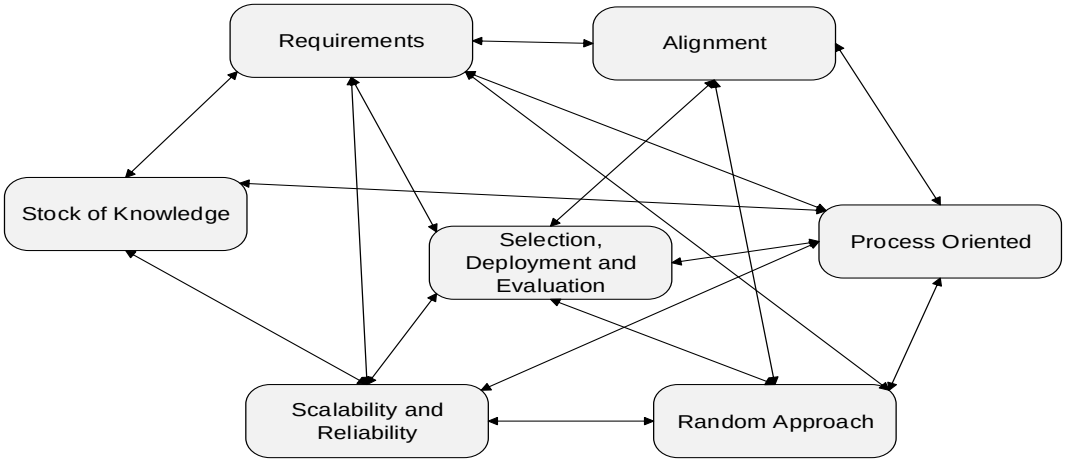

Figure 6.1: Factors IT Solutions (ABN.)

Requirements

Requirements are resources used to define specific needs, including size, quality and boundary. Requirements refer to the needs, conditions or capabilities that must be addressed to meet a specific task or objective (Plataniotis et al., 2015). In many organisations, it is used to identify and select other resources such as skill set (human), IT solutions processes, activities and events. The ability to effectively fulfil these requirements is critical for an organisation's competitiveness, profitability and sustainability.

In the process of selection, deployment, and evaluation of IT solutions at ABN, there were two types of requirements; business and technical requirements. The requirements were guided and influenced by other factors, which included the organisation's goals and objectives, environmental factors, and human capital. As a result, the requirements were not always static. The flexibility and ever-changing nature of the requirements make it at times cumbersome. Thus, there is emphasis on the appropriateness and accuracy of the requirements. The ability to appropriately define requirements is critical for achieving business goals and objectives. The appropriateness of requirements is an underlining and important factor in the selection, deployment, and evaluation of IT solutions.

The technical requirements depend on the business requirements. The business requirements define the resources required to achieve business goals and objectives. It is based on the business requirements that requirements for IT solutions are formulated in enabling and supporting the organisation's (business) needs. The technical requirements define features and specifications that an IT solution must possess in order to address business requirements.

This implies that both the business and technical requirements must align to be able to address business needs. Therefore, misalignment can have implications such as: (1) inefficient business processes; (2) lack of compatibility; (3) low response time; (4) selection and deployment of inappropriate solutions; and (5) project scope creeping. The manifestations of these implications can have negative impact on an organisation's sustainability, competitiveness and profitability.

Alignment

Alignment entails coalition and cohesiveness of entities, toward a common goal and objective. According to Nadler and Tushman (1983: 119), alignment refers "to the extent to which the needs, demands, goals, objectives and structures of two components are consistent with each other". Alignment defines how related two different components are to each other. The degree of alignment between two different entities will define their connectedness. In ABN, it was realised that an alignment between the activities of the business and IT divisions was critical for seamless operations, which was essential for the organisation. This was evident in how solutions were problematised from both users (operation) and senior management (strategic) perspectives.

Strategic entails long term plan or intent of actions developed to meet a set goal (Dandira, 2012). The approach is vital as it helps define activities, processes and resources required to achieve a set task. Also, strategic intents are vital for the enhancement and support of operational activities. For example, the strategic intent defines and dictates how IT solutions are selected and deployed for business purposes and operations. Therefore, it is critical for both strategic and operational activities to be aligned in an organisation. Operational activities are critical for the attainment of business goals and objectives. According to Lindawati (2020), operational activities are the arrow head of all organisational activities. Operational activities are the core activities that an organisation carries out to meet business goals and objectives. These activities are considered to be effective if they are able to achieve set goals. For operational activities to be effective, there must be a concerted strategy which defines how these activities must happen.

The management of the ABN were well aware that lack of alignment between strategies and operational activities has negative implications for their business goal and objectives. Lack of alignment often results in low productivity, which makes it challenging for organisations to

achieve their goals and objectives. This is because the sequence of processes and activities is critical in the selection, deployment and evaluation of IT solutions.

In ABN, the activities and processes were often left to the discretion of the managers of these events. The implications are that some of the managers employed their authority and power to drive the activities and processes involved in the selection, deployment and evaluation of IT solutions based on their personal interest, as opposed to the organisation's purposes. Such conflict of interest had impact on service delivery. Also, the conflicting interest enacts favouritism and nepotism in that employees' participation was not based on merit or know-how. In addition, this had negative effects on the morale of those staff who felt victimised.

Process-oriented

A process is a uniform set of sequence of action(s) performed toward achieving a given task or objective. In ABN, process was considered the backbone towards achieving the goal and objectives. It defines tasks or activities that need to be executed through a sequential order (Rizk et al., 2020). The sequence of activities needs to be clear, articulate and focused on achieving the set task. According to Barta and Gorcsi (2019), processes must be arranged to give priority to those areas of business that need attention the most. Strong processes can guarantee the alignment of business activities and business objectives.

In the absence of tight processes, the sequence of activities becomes incoherent. When processes become incoherent, activities are then not appropriately articulated, guided or focused. The processes inherent then become reactive rather being proactive. A weak process leaves room for undesirability such as intrusion and zig zag executions. In ABN, tasks were assigned to units and teams, which in turn, were allocated to individuals and groups, according to roles and responsibilities. There was often no pragmaticism in the process. As there was no specific pattern or method through which tasks were allocated to units and employees in the organisation. This was fundamentally flawed in that some units and employees find it difficult to plan schedules and execute their tasks and responsibilities. The focal (manager) seizes the prerogative to make decisions as pleases them in the allocation of tasks. Also, there were no dedicated teams in the execution of tasks, such as the assessment or evaluation of IT solutions.

Lack of uniform approach

An approach that is strategic is often adopted to accomplish a set task or objective. According to Van der Waldt (2017), an approach refers to the methodologies and techniques that are used to achieve objectives. This means that an approach influences the outcome of objectives in which it is used. Hence it is critical to employ an appropriate approach in carrying out tasks. In ABN, there was no uniformity in the approaches that were employed. Two main approaches were prevalent, top-down and bottom-up. The two approaches were commonly used in information gathering and knowledge processing, particularly in the selection, deployment and evaluation of IT solutions in the organisation.

In the use of the top-down approach, the process starts from the top, which is the executive and senior management of the organisation, and it is drilled down to the lower levels of employees. This approach was employed across the divisions of the organisation. In the selection, deployment and evaluation of IT solutions, the approach was a mixed bag of detriment and benefits. The top-down approach was detrimental in that some employees felt a sense of imposition; that solutions were being forced on them. By interpretation, it means that they have been denied of executing and demonstrating their technical know-how and capabilities. As a result, they were resistant. Some employees even tried to sabotage some initiatives, as a result. From the benefits perspective, there was political and managerial will and support to implement decisions.

Similar to the top-down, advantages and disadvantages were experienced in following the bottom-up approach in the selection, deployment and evaluation of IT solutions in the organisation. One of the advantages was that there was inclusivity, which made many employees feel a sense of empowerment and relevance. This approach motivated employees to carry out tasks to the best of their knowledge. However, the fact that the activities start from the bottom and moves up (Khan, 2019), did not mean that approval was easy or guaranteed. In some cases, those activities did not get the buy-in from some senior management. This was frustrating to some of the IT personnel, primarily because they considered their efforts wasted or unappreciated.

The approach which an organisation adopts in information gathering is critical for achieving the set business goals and objectives. Where there is inconsistency in the approach, the achievement of the set objectives becomes challenged. Inconsistency in approach leads to the use of a random approach. The implication is that decisions will be made at multiple levels

and as such there is the risk of the organisation not having a clear strategy. In ABN, the bottom-up approach enabled the end users to participate. The implication of it was that the end users had the power to shape their requirements as they deemed fit. This was also influenced by two other factors; interaction and knowledge. The interaction that happened between the actors was critical in that it helped to determine their collective understanding of the organisations' needs.

Scalability and reliability

Technology is increasingly an enabler of banking activities in delivering services (Vaitha & Francis, 2016). In the midst of this enablement, organisations' (banking) activities keep changing rapidly. The changes are influenced by many factors, such as competitiveness and environment, which include government policies and legislations. This requires technology solutions to be scalable and reliable in order to continue to fulfil the organisation's goals and objectives. In ABN, the scalability and reliability were critical factors considered during the selection, deployment and evaluation of IT solutions. According to Kumar (2004), scalability is the degree to which an IT solution can be scaled up or upgraded to handle larger volume of transactions. It is the ability of the technology used to be able to meet growing business needs. Hou et al. (2018) explain how reliability is the probability of a failure-free operation of an IT solution for a specified period of time in a specified environment.

Scalability of an IT solution relies on architecture in order to be reliable. The architecture defines the structure of the components of IT systems, their relationship and governance, including the basic framework (Xuemin et al., 2012). The understanding of the architecture of a complex system, such as those used for banking information, is crucial in the selection, deployment and evaluation of IT solutions. This understanding of the IT system's architecture provides important information required for decision making in the selection and deployment of a reliable, scalable and functional IT solution. This helps with the uniformity, stability and manageability of the solution, which give the competitive edge.

The management of ABN acknowledged the need for a scalable and reliable IT solutions. This was because some of the senior management in the organisation were well aware of the implications of IT solutions that are not scalable and reliable. From the analysis, some of the implications that were revealed are: (1) poor quality of service delivery. This ultimately affects income generation and profitability; (2) non-alignment of business and IT. This makes it challenging to achieve the goal and objectives; (3) increase in customers' dissatisfaction,

which has impact on sustainability; and (4) security breaches. These have a negative effect on business continuity, which affects competitiveness, sustainability and reduces customers' trust and reliance on the organisation.

Stock of knowledge

Knowledge refers to the understanding and information possessed by an individual or group; which is applied to solving or explaining an event. Pant et al. (2018) describe knowledge as relevant and required information about an entity. knowledge is gained from experience and through the construction of meaning about an entity or circumstantial events (Choo, 2000). Knowledge accumulated over a period is referred to as stock of knowledge, which De Carolis and Deeds (1999) describe as information assets over time that enrich individuals and groups. In ABN, stock of knowledge was critical in gaining a better understanding of needs, events and services. The stock of knowledge helps to determine the allocation of roles and responsibilities, including teams' deliverables within an organisation.

In the selection, deployment and evaluation of IT solutions at ABN, roles and responsibilities were assigned to individuals and teams based on collective knowledgeability. Also, teams' collective knowledge helps formulate contractual obligations for carrying out tasks. Thus, stock of knowledge is used for both negative and positive purposes through conscious and unconscious actions. This is primarily because stock of knowledge is a source of power. In ABN, such power was used by some to negotiate and determine the types of IT solutions that were selected or evaluated for business purposes. By implication, such tactics embroiled interactions and ultimately defines the relationship between employees. This did not always create a conducive environment in the course of executing IT solutions in the organisation.

In ABN, power and relationship (interactions) were critical for achieving set goals and objectives. The power and interactions formed the basis for the selection, deployment and evaluation of an IT solution. However, in power relationships, human and technical issues often manifest. The human challenges often manifested when some of the employees struggled for recognition and power. The conflicts in power relationship have implications; one of which is a division of ideology, which affects the organisation's interest and goal. From the perspective of technical factors, some spokespersons were challenged with ability and knowledgeability; thereby becoming a struggle for some spokesmen to mobilise their colleagues and other stakeholders because they were not convinced if they had the right or appropriate product (IT solution) or could deliver quality services.

6.3 Southern Bank of Nigeria: Discussion of the Findings

ANT was used to guide the analysis of the data. From the analysis, the factors that influenced the selection, deployment and evaluation of IT solutions in the organisation were identified. As shown in 5.4, the factors are requirements, process-oriented, internalisation, IT governance, externalisation, and change management. The factors are inter-related as illustrated in Figure 5.4. The discussion that follows should be read in line with Figure 5.4, for a better understanding of how the factors relate with each other and together influence the selection, deployment and evaluation of IT solutions.

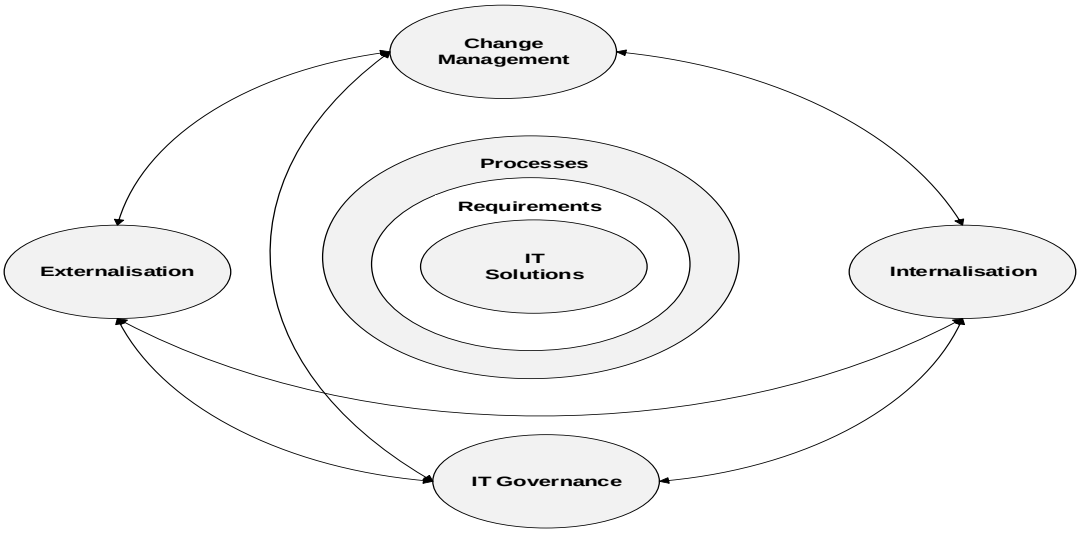

Figure 6.2: Influencing Factors in SBN

Requirements

Requirement is a factor of influence in that it is a fundamental condition that needs to be fulfilled in order to accomplish a specific task. Requirements are things that are considered essential for achieving specific objectives. Requirements was referred to by Wan Park et al. (2020) as the things that are essential to resolve basic goals or motives. In organisations, requirements can include business processes, activities, events, skills, and technology tools that can be used to facilitate the achievement of business goals and objectives for competitiveness. Thus, requirements are critical in the selection and deployment or evaluation of IT solutions used by organisations. The ability to effectively fulfil, define and address business requirements can enhance competitiveness, profitability and sustainability.

In SBN, there were two types of requirements that influenced the selection, deployment or evaluation of IT solutions; the business and system requirements. The business requirements

were derived from the activities of the business division, while the system requirements were defined by the IT division. The business requirements were shaped by those obligations that needed to be fulfilled to meet their clients and business partners' business needs. For business to fulfil the clients' demands, requirements were at the forefront, to guide the IT division in support. Also, the business requirements formed the basis for generating (or extracting) system requirements. System requirements refer to the basic characteristics that IT solutions must possess in enabling and providing support to business logic and processes. They are the basic conditions and capabilities that IT solutions in development must meet to be able to solve business needs. The ability of an organisation to satisfy these requirements is vital for the selection, deployment or evaluation of an effective IT solution.

The appropriateness of both the business and system requirements are critical for the selection, deployment or evaluation of IT solutions. Therefore, the inability of an organisation to appropriately define, scope and align both the business and system requirements has consequences. Consequently, the inappropriateness or a misfit of business and system requirements leads to negative attributes such as (1) inefficient business processes; (2) poor systems' integration; (3) inappropriateness in the selection and deployment or evaluation of IT solutions; and (4) project and budget overrun. Some of the effects are that business goals and objectives are negatively affected. Thus, poor services are highly likely to continue to be provided to the clients and partners. In addition, these factors might lead to wastage of scare resources through duplications and redundancy. Also, these negative outlooks have impact on the competitiveness, profitability and sustainability of the organisation.

Process-oriented

A process refers to interrelated activities and decision points that collectively lead to an outcome (Dumas et al., 2013). It is a set of activities designed to achieve a specified out-put. Its iterative approach and dependency make a process oriented. Alkoot (2019) refers to processes as activities that take into consideration certain inputs and add value to them, in order to produce an expected output. As such, a process enhances the chances of accomplishing specific objectives; the processes followed is of essence. Vanpoucke et al. (2014) affirm that the appropriateness of processes followed is critical for satisfying related requirements and to be competitive. In SBN, there were processes that were followed in generating requirements used in the selection and deployment or evaluation of IT solutions. The processes followed were of significance in defining the requirements with which the selection, deployment and evaluation of IT solutions were done.

A strong process refers to activities that are well planned, tested, executed and result-oriented. In organisations, where there are no strong or tight processes followed, there are bound to be challenges in appropriately defining the requirements critically needed for the selection and deployment of an effective IT solution. This is because in the absence of a strong or tight process, the activities and events involved in defining requirements will be un-coordinated and not focused. Hence, the activities and events will not be business process oriented. This will mean that there will be no defined line of actions in information gathering, analysis, communication and collaboration. These factors are essential for adequately defining requirements which shape the IT solutions selected and deployed. The implications of such an approach include: (1) Misalignment of business/IT objectives; (2) incompatibility; (3) inappropriateness of IT solution selection, deployment or evaluation: and (4) continuous requirements creeping. The persistence of these factors will negatively affect the organisation's goals and objectives.

Internalisation

In the context of this study, internalisation refers to the integral parts (or factors) of the organisation that influence IT solutions. These factors can either be tangible or intangible in nature (Mazikana, 2019), which act as drivers or barriers in attempts to achieve an organisation's goals and objectives (Susilo et al., 2020). Some of the factors are available skill set, principles, standardisation and facilities, including processes and artefacts. For example, in SBN, principles and skill set played critical roles in the selection, deployment and evaluation of IT solutions used for organisational activities and purposes. Based on the guidelines and standards of the organisation, certain activities and events in the selection, deployment or evaluation of IT solutions were managed by the project management office. This included the management of the IT solution vendors and companies. The appropriateness of IT solution companies is vital in the deployment and use of IT solutions.

Managing internal factors is of significance in achieving organisations' goals and objectives. The inability to effectively manage internal factors can negatively affect the selection, deployment and evaluation of IT solutions. For example, in the absence of proper policies and standards, processes and events might not appropriately be guided and coordinated. Some of the consequences are (1) poor process execution; (2) lack of process sequence, which leads to zig-zag approach; (3) process misalignment; and (4) in-effective processes. For example, in the two organisations used in this study, there was no framework to guide the evaluation or assessment of processes and events. In addition, there was no dedicated evaluation team that

specialises in the evaluation of IT solutions' implementation and use. According to Jeston and Nelis (2008), in the absence of proper governance processes, process design and strategy will be misaligned. The appropriateness of internal factors such as processes, standards, stock of knowledge, and policies negatively affect the selection, deployment and evaluation of effective IT solutions.

IT Governance

Information technology (IT) governance consists of policies, standards, and principles. It is primarily used to enforce enterprise architecture (EA). This is mainly because both EA and IT governance collaborate in the areas of policies, standards, and principles. The IT governance guides business processes, activities and technology solutions engineered by the EA. Hirst (2000:24) refers to governance as "the means by which an activity or an ensemble of activities is controlled or directed." This is mainly to ensure the activities follow a defined path to achieve the expected outcomes. In the field of IS, governance refers to established procedures and policies followed to ensure that IT solutions deployed sustain business goals and objectives (Herbst et al., 2013). In SBN, there was an IT governance, risk & compliance unit. The responsibility of the unit was to ensure that established procedures and policies relating to IT activities were adhered to.

The EA is used to transit from a current state to a desired state (Iyamu, 2015). In the absence of proper governance, the processes, activities and events involved in the selection and deployment or evaluation become incoherent. The implication is that those activities will not take into consideration the broader organisation's requirements and business objectives. The implications of such incoherent and unfocused activities will include (1) non-alignment of business/IT goals and objectives; (2) inappropriateness of IT solutions to business processes; (3) compatibility and usability challenges and (4) business value will not be delivered by IT solutions deployed. This negatively affects organisation's goals and objectives.

Externalisation

Externalisation refers to external factors that can influence events in an organisation (Lelissa, 2019). According to Mazikana (2019), external factors can influence the success or failure of IT solutions in an organisation. In SBN, the selection, deployment and evaluation of IT solutions were influenced by certain external factors, such as regulations, interactions and relationship between actors. For example, the selection, deployment, or evaluation of IT

solutions used for the foreign trade operations in the organisation was dictated by Central the Bank of Nigeria. The Central Bank of Nigeria regulates all banking activities in Nigeria.

In SBN, for example, the determination of certain IT solutions selected and deployed were based on requirements and assessments gathered from third parties (organisations) that had experiences with the same technologies. The requirements and assessment were based on regulations and interactions between actors. For a successful selection, deployment, or evaluation of effective IT solutions, there is the need to be able to identify these factors and effectively manage them through regulations and interactions. The inability of an organisation to identify and manage external factors has consequences which include: (1) business-oriented process will continue to be challenged; (2) inappropriateness of evaluation criteria; (3) selection and deployment of ineffective IT solutions; and (4) system incompatibility. The implication of these factors will have negative effect on the organisation's competitiveness, profitability, and sustainability.

Change Management

Organisations introduce change initiatives to enhance business processes and activities. Kawtar et al. (2019) refer to change as a transformational process that leads an organisation from its current state to an improved future state. This is carried out through EA in many organisations because it transits both business processes and IT solutions from current to the future states. A change challenges the norm in an environment. It alters structures, methods and processes through regulations and interactions (Zel, 2016). To derive the expected benefits, change needs to be effectively managed. According to Hawking et al. (2005), change management involves managing and coordinating people, business processes and systems (governance) to ensure that the purpose for which the change was introduced is achieved.

Change management takes cognisance of both internal (internalisation) and external (externalisation) factors in organisations. Poor change management can have implications such as (1) the selection and deployment of ineffective IT solutions; (2) disruption in business processes and activities; (3) non-alignment of business/IT goals and objectives; and (4) ineffective resource management. The persistence of these factors will negatively affect the organisation's goals and hence its competitiveness, profitability and sustainability.

6.4 A framework for evaluation of IS systems

The findings from the analysis of data from the two case studies are shown in Figure 6.3 as case #1 and case #2, respectively. In order to develop a framework which is the aim of this study, a two-step approach was followed: (1) the findings from the two cases (organisations) were mapped against each other as shown in Figure 6.3. Arrows were used in the mapping to illustrate interrelations and connectedness of the factors from both cases. Subsequently, similarities and critical factors of influence were established from the mapping. (2) the critical influencing factors were interpreted by following the meanings that were associated to the factors in the analysis and discussion of the findings stages, as presented in chapter 5 and the beginning of this chapter, respectively.

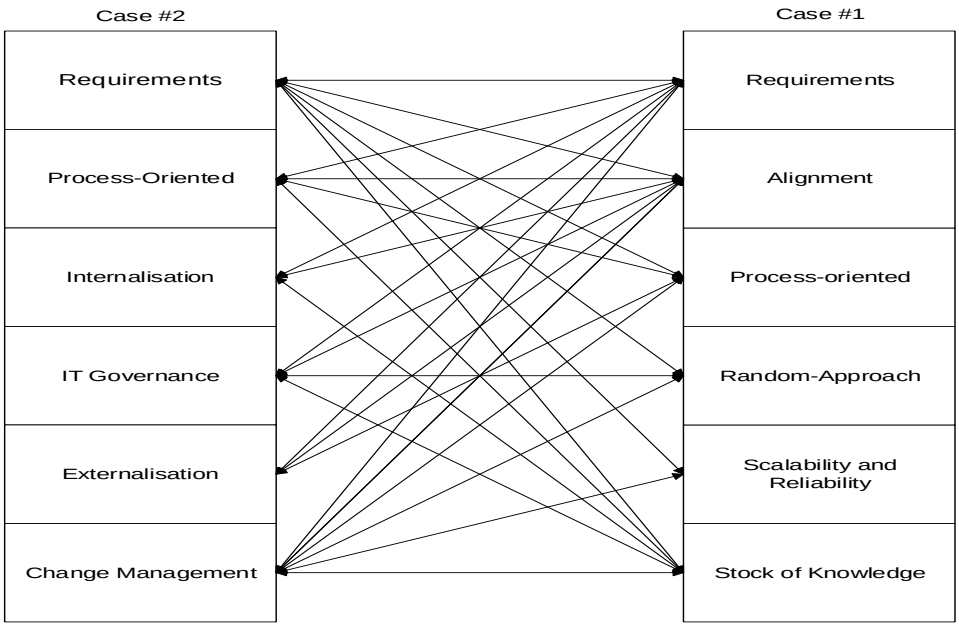

Figure 6.3: Influencing factors of IT solutions

From the first step of the two-step approach, based on the meanings associated with the factors, similarities and nearness were identified. This allows and enables the grouping of the factors. Thus, the factors were grouped into four categories: (1) organisational vision; (2) organisational strategy; (3) enterprise architecture; and (4) IT & business.

Following the subjective approach perspective, the factors were interpreted according to the groupings. Based on the interpretation, a framework was developed as shown in Figure 6.4. The discussion that follows explains each of the groups, to demonstrate how the factors can guide and influence the selection, deployment and evaluation of IT solutions for organisational

purposes. Thus, the discussion should be read with the Framework (Figure 6.4) to gain better understanding.

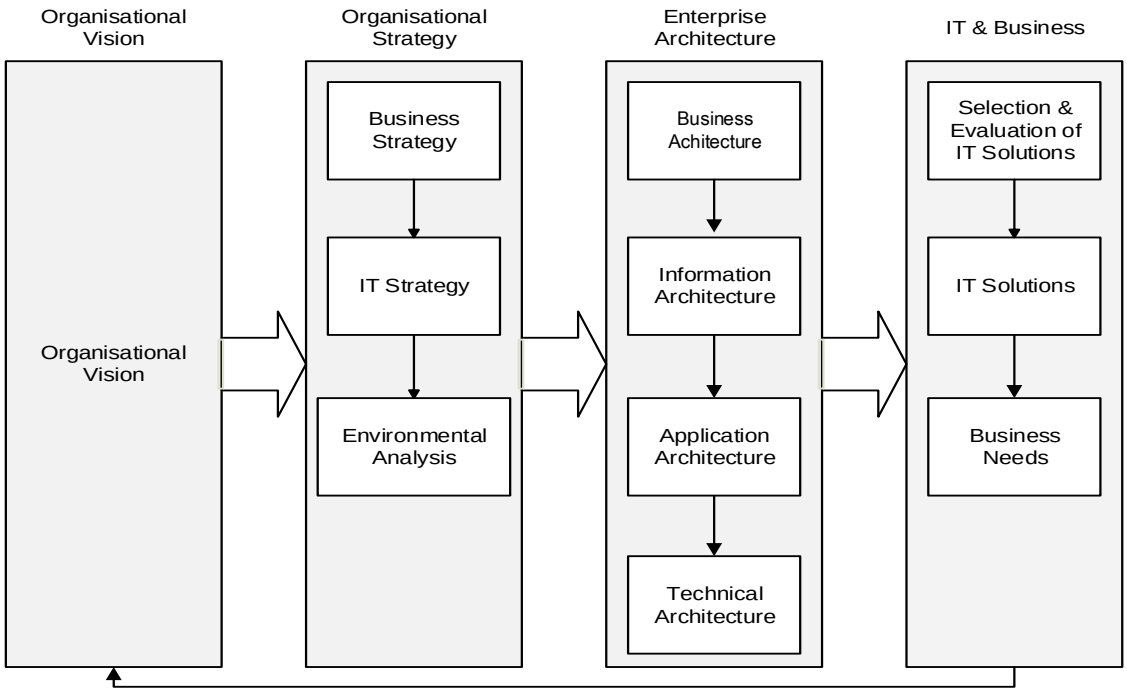

Figure 6.4 A Framework for evaluation of IT Solutions

Organisational vision

More often than not, organisational vision defines the state that an organisation desires to attain, at both long and short term bases. At the desired state, an organisation's goal is to be competitive, profitable and sustainable. It is against the organisational vision that organisational strategy (or strategies) are formulated. As a result, the strategies must be evaluated to determine and validate the purpose for which the organisational vision was articulated. This is primarily because the vision drives the objectives, needs and requirements which are fundamental for the formulation of strategies which ultimately lead to the selection, deployment and use of IT solutions. Thus, organisational vision drives and determines capacities, services and conditions that must be addressed by the organisations to meet their needs.

To ensure appropriate formidability of organisational strategies, organisational vision must be explicit. This is because the vision shapes the objectives, needs and requirements of an organisation. Also, an explicit vision enables the development of clear and unambiguous

objectives, for business processes, operations and strategy. In return, objectives drive and shape the strategies which are critical for meeting the needs and requirements of an organisation. Strategies are the action plans to be followed in accomplishing a task or meeting an objective, including skill set and facilities. An alignment of strategies and business operations are vital for meeting the organisation' objectives and vision. An alignment implies that the needs and requirements needed to enhance and support business processes and operations were addressed. For appropriateness, organisational vision requires adequate skill set. Skill set can enable the formulation of strong strategies which are necessary for accomplishing a task successfully or achieving an objective.

Organisational strategy

Organisational strategy is a planned and detailed set of actions and activities that are designed to achieve the objectives of an entity. Planned actions and activities are critical toward achieving visions and goals for sustainability and competitiveness purposes. This includes transcending from the current state to a future desired state of organisation's processes, events and activities. From the perspectives of the organisations that participated, organisational strategy focuses on three main areas; business strategy, IT strategy, and environment analysis. This entails a holistic approach that is enterprise-wide in nature and covers the operations, activities and processes of the organisation. According to Kwayu and Abubakre (2018), this includes how people and technology interact to affect organisational strategy.

Business strategy consists of the actions and decision making that is essential for addressing business objectives. This includes identifying and understanding the business needs and requirements. The understanding is vital for defining functional requirements, which are critical obligations and conditions that business needs to fulfil in order to achieve its goals and objectives. For example, in SBN, business plans to enhance its IT solutions and processes to facilitate ease of business operation and to gain competitive advantage. Thus, business strategy provides information and means that are critical for moving the organisation from current state to future state.

IT strategy focuses on aligning IT with the business objectives. This is done by enabling and supporting the processes, activities, and operations of the business. In doing so, IT strategy provides a plan and a guide for selecting and deploying appropriate IT solutions. In IT, strategies detail the activities and IT resources that are critical for aligning IT and business

objectives. Alignment of business and IT objectives is critical for the achievement of an organisation's goals and objectives. This is because IT/business alignment enables business to derive value from the IT strategy perspective. For appropriateness, the strategies need to take into account the environmental factors. Environmental factors consist of both internal and external factors.

Environmental analysis enables an organisation to identify, examine, understand and manage both the internal and external factors that have the capacities to influence the activities and shape outcomes (objectives) of organisational strategy. Internal factors include skill set, procedures, standardisation, principles, culture and facilities. These factors have capacities to either positively or negatively influence task outcomes or objectives. According to Jiang et al. (2014), the management of internal factors is critical for minimising the risk of IT project failure. External factors are those conditions that are not within an organisation's control. Some of these include regulations, standards, conditions and interactions (interference groups) whose activities influence business processes, operations and decision making. Both internal and external factors need to be identified, examined and understood to be able to effectively manage them.

Thus, business strategy, IT strategy, and environmental analysis drive the enterprise architecture (EA). This is primarily because it is a holistic approach that covers both business and IT operations and activities including the alignment of both units and the enablement of assessment and management of internal and external factors. Thus, EA has the capacity to facilitate change from a current to a desired state, thereby, fulfilling the organisational strategy.

Enterprise architecture

Enterprise architecture (EA) is an approach that offers coverage for an enterprise's business and IT systems and their interrelationships (Gong & Janssen, 2019). EA consists of models and governance methods for assessing current and future states. The models and governance methods are required and vital for planning, designing, implementation and management of the different components, from information to processes and design of an organisation. Also, the alignment of these components are vital for achieving the organisation's objective, which is to enable IT activities to deliver value to business. In evaluation, EA enables an organisation to identify the gaps that exist between the components of the organisation. The gaps hinder business processes and operations. The identification of the gaps is vital for planning,

designing, implementing and managing requirements that are critical for aligning IT and business objectives.

EA covers an organization's business processes, information flow and exchange, application and technical infrastructure, and facilitates the integration of strategy, personnel, business, and IT (Niemi & Pekkola, 2019). Iyamu (2015) provides a comprehensive explanation of the four domains of EA; business, information, application, and technical architectures. Business architecture enables an understanding of the structure of business. This understanding is vital for the identification and determination of business requirements. Business requirements form the basis for the selection and deployment of IT solutions that are used for service delivery. Information architecture defines the structure of information within the system. The structure of information influences the way that data are retrieved and used for decision making. In both ABN and SBN, information was critical for decision making and service delivery. In evaluation, information architecture enables an organisation to determine the gaps that exist in the information structure. This knowledge is important for the management of information structure and architecture. Enhanced information structure is required for meeting the organisation's service delivery goals and objectives.

Application architecture enables an understanding of the sets of applications that are used for business processes and the interactions that happen between them. This understanding is important for identifying and managing the gaps that exist in the application domain. In addition, application architecture enables an understanding of the relationship that exists between the applications that are used for business processes. This understanding is needed for enhancing applications to align with business processes. Technical architecture focuses on the technicalities, specifications and conditions of IT solutions. IT specifications and conditions are the capacities that enable IT solutions to drive business processes and operations. Technical architecture enables an analysis and understanding of the IT technical infrastructure. This understanding is critical for identifying and developing system requirements which are essential for meeting business objectives.

Enterprise architecture is critical in defining and forming the requirements which are vital for enhancing business processes and operations. This is because EA enables an organisation to understand the existing structure of the enterprise both from the business and IT perspectives. This understanding is essential for identifying the gaps that exist and what is required to bridge the gaps. These gaps define the requirements which shape the IT solutions

and activities selected, deployed and used for business processes and operations. In alignment with business and IT strategies and objectives, IT governance, approach and stock of knowledge can enable an organisation to drive the activities and events that are involved in the planning, designing, implementation and management of IT solutions in the right direction.

Information technology and business

In organisations, IT and business units collaborate to achieve the organisational goals and objectives. In doing so, the IT unit provides, implements, manages and secures the IT solutions that are used to enable and support business processes and activities that are involved in meeting business needs and objectives. IT solutions include the software, technology, hardware, processes and skills that are employed to manage and use these resources. The appropriateness of the IT solutions that are deployed and used is vital for the alignment of IT and business. In alignment, IT solutions are used to enhance and support business activities and events. Also, business drives the production and delivery of services to the clients and business partners. The quality of services produced and delivered are critical for competitiveness, profitability and sustainability, which ultimately helps to achieve the organisational vision.

The appropriateness of IT solutions selection, deployment and use is therefore of essence for the alignment of IT and business. For appropriateness, IT solutions selected for use need to be consistently evaluated. In selection or evaluation, requirements that form the basis for the assessment of IT solutions come from IT and business units. On the business front, requirements are driven by the critical obligations that need to be addressed in order to fulfil the needs and objectives of the organisation. Thus, the business needs are shaped by the organisation’s goals and objectives. The business requirements form the basis for the technical or system requirements that are developed in IT. Also, in IT, requirements consist of functional and non-functional requirements. The functional requirements define the behaviour or the actions the systems must possess to enable business to meet their obligations and deliver services to their clients. The non-functional requirements relate more to the conditions and the environment of IT solutions such as scalability and reliability.

The ability of an organisation to select and deploy IT solutions that fulfil both business and IT requirements is critical in achieving the organisational vision. Business needs consist of the critical obligations that an organisation must address to achieve its objectives and subsequently its vision. Some of the critical obligations are business processes, rules,

procedures, and resources that drive business processes, strategy, and operations. Thus, the business needs are primarily based on the requirements of the organisation, customers and other parties that have interest in the business activities and events. It is therefore important to always align IT solutions with business needs toward achieving organisational vision. This is facilitated through the selection of appropriate IT solutions and continuous evaluation of the solutions against business requirements.

6.5 Conclusion

This chapter presents the findings from the analysis of data from the two cases studied. The findings were further interpreted. Both the analysis and interpretation revealed the factors that influence selection, deployment and evaluation of IT solutions in the banks used as cases in the study. Based on these factors, a framework (Figure 6.4) was developed. The framework is intended to guide the appropriateness of IT solutions in enabling and supporting banking information systems to enhance sustainability and competitiveness. The next chapter draws a conclusion of the thesis.

Chapter 7

Conclusion and Recommendation

7.1 Introduction

The chapter concludes the study. The chapter presents the study's evaluation, contributions and recommendations. The recommendations are based on the gaps that were identified from the findings that were derived from the analysis of data gathered from the cases in the study. The chapter, also presents the summaries of the chapters of the study.

The chapter is divided into seven sections as follows: (1) introduction; (2) summary of the study; (3) the evaluation of the study; (4) the contribution of the study; (5) recommendations; (6) benefit of the study; (7) recommended further study; and (8) the conclusion.

7.2 Summary of the Study

This section presents the summaries of the chapters of the study. The chapters include; (1) the introduction; (2) literature review; (3) research methodology; (4) case study overview; (5) data analysis; (6) findings and interpretation; and (7) conclusion.

Chapter 1: Introduction

The chapter one formed the basis for the study. This included an introduction of the research topic, background and the research problem. The research topic is "a framework for the evaluation of banking information systems in Nigeria. The research was motivated by the poor quality of services that are rendered by the banks in Nigeria and its attendant consequences for both the clients and service providers. It was against the background that the research problem (phenomenon) were formulated. Based on the research problem, the aim and objectives of the study was developed. The aim and objectives of the study guided the research questions.

Also, the chapter presented a brief of literature review, research design and methodology, ethics, delineation of the study, expected outcomes and contribution. These topics were further explored and discussed in detail in subsequent chapters in the study.

Chapter 2: Literature Review

The chapter presented the review of literature that are related to the topic under study. This included a review of the following; (1) information systems and information technologies; (2) information systems and information technology for banking services; (3) banking services in

Nigeria; (4) information systems evaluation model; (5) information system and information technology evaluation; and (6) under-pinning theory. The chapter revealed that gaps that were yet to be addressed in IS studies. This helped put the study within context.

The chapter also discussed the actor-network theory (ANT). The theory that was used to under-pin the study. The four moments of translations from the perspective of ANT was employed in the analysis of data. ANT was used to identify the actors and networks that are involved in the selection, deployment and evaluation of IT solutions that are used by Nigerian banks.

Chapter 3: Research methodology and design

The chapter presented and discussed the research methodology and design that was followed and used to achieve the objectives of the study as stated in chapter one. The chapter explained in detail the strategies and approach that was employed in the collection of data that was critical for answering the research questions. The qualitative research methods were based on the objectives of the study which was to identify, examine and understand the factors that influence the selection, deployment and evaluation of the IT solutions that are used by the Nigerian banks. The research design adopted was a case study approach and the data collection technique was semi-structure interview.

Chapter 4: Case Study Overview

The chapter presented and discussed the two cases that were used in the study. This included their background, structure and the units that use and manage the IT solutions. The units are the business and IT. Data was collected from the two units to answer the research questions. The answers to the questions helped the study to achieve its objectives and aim. The cases are Action bank of Nigeria (ABN) and Southern bank of Nigeria (SBN). These names are pseudo names. The chapter had four sections; (1) the introduction; (2) the overview of ABN (case #1); (3) overview of SBN (case #2); and (4) the conclusion.

Chapter 5: Data Analysis

Chapter 5 presented separately the analysis of data from both cases. The four moments of translation from ANT's perspective were applied for the analysis of the data collected from both cases. The data from the cases were analysed separately using ANT's four moments of translation. This enabled the identification of the actors, networks, interactions and activities that were involved in the selection, deployment and evaluation of IT solutions used by the

banks. ANT helped established how the activities that are involved in IT solutions selection, deployment and evaluation transformed. This enabled an understanding of the interactions and relationships that happened between the actors and actor networks that are involved in the selection, deployment and evaluation of IT solutions. This understanding helped get a deeper insight into why things happen the way they do in the selection, deployment and evaluation of banking IT solutions in Nigeria.

Based on the analysis of data collected from the cases in the study, the findings and interpretations were presented in chapter 6.

Chapter 6: Findings and interpretation

Chapter 6 presented the findings and interpretations of the study. Based on the findings and interpretation, an evaluation framework for the evaluation of banking information systems in Nigeria was developed (figure 6.4). The proposed framework can be used to guide the evaluation of IT solutions that are used for proving services to clients and business partners by the banks in Nigeria and other developing countries with similar challenges.

7.3 Evaluation of the Study

This section presents an assessment of the study. This includes how the study achieved its aim and objectives. The aim and objectives were presented in both chapter 1 and 3 of the study. The aim of the study was to develop a framework for the evaluation of banking information system used in Nigeria banks. The objectives are presented as follow:

1. To establish how IT solutions are applied for banking activities by the Nigerian banks.
2. To examine and understand the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria.
3. To examine and understand how IT solutions are identified, selected and evaluated in the Nigerian banks.

To achieve the aim and objectives, research questions were formulated. The answers to the questions enabled the study to achieve its aim and objectives. The main research question was “how can the challenges that affect IT solutions use for the banking activities in Nigeria banks be addressed?” To provide an answer to the main question, the following sub questions were developed;

1. How are IT solutions applied for banking activities by the Nigerian banks?

2. What are the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria?
3. How are IT solutions identified, selected and evaluated in the Nigerian banking institutions?

Martensson et al. (2016) viewed evaluation of a study as a means to determine its contribution, credibility, communicability and conformity to ethics of the study. In the evaluation of study, criteria that are critical for assessing a research study were formulated. The criteria were based on the need to establish the originality of the study, rigour, significance and the appropriateness of methodologies followed in the achieving the aims and objectives of the study.

The criteria and discussions are presented below:

1. **What new perspective has the research introduced?**

The methodology and approach that was followed in the research study brings a new perspective to IS research and academia. This includes how the actor-network theory (ANT) was applied in the analysis of the data collected. ANT was used to identify the actors and the heterogenous networks that are involved in the selection, deployment and evaluation of IT solutions used for banking services. The study forms a basis for future IS research in banks in Nigeria and other developing countries with similar challenge.

The study also contributes from the perspective of the framework that was developed. The proposed framework can be used to guide the selection, deployment and evaluation of IT solutions that are used by Banks in Nigeria and other developing countries that have similar challenges. Appropriate evaluation can be used to address the technical and non-technical challenges that hinders the effectiveness of the IT solutions that are used for providing banking services. This will enhance the banks' competitiveness, profitability and sustainability.

2. **How can the study enhance and improve the quality of banking services rendered to the clients and business partners in Nigeria?**

The proposed framework can be used to guide the selection and evaluation of the IT solutions that are used by the banks to provide services to their clients and business partners. This includes providing a guide to the banks on how to identify the factors that challenge the effectiveness of the IT solutions that they use. Appropriate selection and evaluation can be used to address system failure that are caused by both technical and non-technical factors.

Also, appropriate evaluation can enable early detection of deficiencies. This is critical for effective management of the IT solution that are deployed and used for providing banking services. Effective management is essential for averting the system failure.

Persistent failure of IT solutions will negatively impact the quality of services that are provided to the clients. Addressing and averting the potential failure can improve the efficiency of IT solutions used for banking services and hence the quality of services that are provided to the clients and business.

3. How was the study carried out?

The strategies, methodologies and approach that were followed were guided by the objectives and aim of the study. The objectives were to understanding of the activities that happen in the selection, deployment and evaluation of the IT solutions that are used by the Nigerian banks. The study took into consideration the need for articulation and sequence of the study. Articulation and sequence is vital for alignment of strategies followed and focus.

Chapter one formed the basis and the framework for the study. The objectives and aim of the study was clearly stated. Chapter two discussed the existing literature that was related to the phenomenon being studied. This helped identified the gaps that exist and this helped place the study within the context of the existing literature. This further gave credence to the research problem and aim of the study. Chapter 3 detailed the research design and methodologies followed. The research design and methodologies were guided by the objectives of study as presented in chapter 1 and 3. Qualitative methods in combination with a case study design was employed to gain an understanding of the underlying factors that influence the phenomenon that was researched. ANT was employed for the analysis of data collected using the semi-structured interview. Semi-structured is appropriate for gaining an understanding of a phenomenon based on interaction with the actors that are involved.

Chapter 4 presented the overview of the cases that were studied. This was to get an in-depth understanding of environment that the phenomenon was occurring. The understanding was critical for relating the phenomenon to the environment in which they occur. Chapter 5 presented the analysis of the empirical data collected from the cases use as presented in chapter 4. Chapter 6 detailed the findings and interpretation derived from the analysis of the data. The interpretivist approach was used in the finding and interpretation of the findings. In the chapter the aim and objectives of the study were achieved. In addition, the chapter also presented the framework that was developed based on the factors that were derived from the

analysis of the empirical data and findings. The methodology and approach followed showed the sequence of the activities and rigor that was involved in carrying out the study.

4. **Why is the study of significance?**

The quality of services provided by the Nigerian banks are not meeting their clients' expectations. This is because both technical and non-technical factors continue to challenge the effectiveness of the IT solutions use. Appropriate evaluation can enable the banks to identify and address the factors that challenge the effectiveness of the IT solutions use. The study developed and proposes a framework can be used by the Nigerian banks to guide the evaluation of the IT solutions that are implemented and used for their business processes and activities. This can enable the Nigerian banks address the factors that challenge the IT solutions and services that are rendered to their customers. Hence, the study is of significance to the practitioners that use and manage IT solutions used for banking services.

The methodology and approach that were followed by the study to achieve its objectives forms as a reference point and guide for IS researchers. This is a contribution to the existing knowledge in literature, application of act-network theory and framework that was developed. The study is of significance to the academia and body of knowledge in that it provides a basis for future IS studies and related topic.

The study is of significance to both practitioners and researchers.

Addressing the research questions:

1. **How are IT solutions applied for banking activities by the Nigerian banks?**

IT solutions are applied in the processes and activities that are directly or in-directly involved the production and delivery of banking services. This include the process and activities in the areas of administration, support, management and operations. In operations, IT solutions are used to drive the business processes and that are involved in providing banking services to the clients and business partners. In support and management, the organisations use IT solutions to monitor, support, manage and provide security for the IT solutions and the environment from IT services are produced.

In administration, IT solutions are applied for processing of administrative work, developing and generating reports which are critical for decision-making. IT solutions enable the banks to

meet their critical obligation which is required for the competitiveness, profitability and sustainability.

2. **What are the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria?**

IT solutions are implemented and use with the intention of enhancing and supporting business processes and activities. This is with the aim of using IT solutions to achieve both service delivery and organisation's goals and objectives. Therefore, it is important for organisations engaging the services IT solutions to identify, examine and understand the factors that influence the implementation and use. Findings revealed that the factors that influence implementation and use include organisational vision, organisational strategies, requirements, regulations and resources. Resources include skills-set, stock of knowledge and technology.

3. **How are IT solutions identified, selected and evaluated in the Nigerian banking institutions?**

Effectiveness and appropriateness of IT solutions deployed and use for business activities is measured by how well the technologies enable an organisation meet its needs and objectives. IT solutions are selected, deployed or evaluated to meet the organisations' requirements and objectives. Therefore, it was important to examine and understanding how banks identify, select, deploy and evaluate IT solutions that are implemented and use for meeting their needs and objectives. This understanding is vital for enhancing and supporting the IT solutions that are selected and deployed to provide services to clients and business partners.

Findings revealed the factors that influenced the selection, deployment and evaluation of IT solutions to include requirements, internalisation and externalisation, IT governance and skill-set.

The main research question

The main research question was "how can the challenges that affects IT solutions use for the banking activities in Nigeria be addressed?" This question was of significance because IT solutions deployed and use for banking activities continue to be challenged without resolve. The ineffectiveness of the IT solutions persistently affects the quality of services that are provided to the Nigerian banking public. This implication is that both the clients and service providers continue to incur millions in income losses due to poor services. This negatively affect their competiveness, profitability and sustainability.

Based on factors that were identified and examined, a framework was developed for the evaluation of the IT solutions that are implemented and use by the banks in Nigeria. The proposed framework will guide the evaluation of the IT solutions that are implemented and use by the banks in Nigeria. Effective and consistent evaluation will enable the banks address the challenges (technical and non-technical) that face the IT solutions implemented and use. Effective and consistent evaluation of IT solutions will improve the IT services that are rendered.

How the study achieved its objectives.

1. **To establish how IT solutions are applied for banking activities by the Nigerian banks.**

The study was able to establish that IT solutions are critical in the delivery of banking products and services in Nigeria. The study revealed that Nigerian banks are increasingly depending on the IT solutions to produce and deliver their services to their clients and business partners. They are applying IT solution the process and activities that are involved in the providing banking services to their clients and business partners. IT solutions are used to facilitate the processing, storage and disseminating information that are critical for effective services delivery. Information plays a critical role in the banking operations. Without, the required information at the right and place, effective services delivery will be hampered.

2. **To examine and understand the factors that influence the implementation and use of IT solutions for banking purposes in Nigeria.**

The banks in Nigeria are increasingly implementing and using IT solution to remain competitive, profitable and sustainable. The study revealed the factors that influence implementation and use to include organisational vision, strategies, requirements and resources. Resources include business processes, skills-set, stock of knowledge and technology.

3. To examine and understand how IT solutions are identified, selected and evaluated in the Nigerian banks.

The findings and interpretation derived from the analysis of data revealed the factors that influence the identification, selection and evaluation of IT solutions. The factors include the requirements, internalisation and externalisation, IT governance and skill-set.

Aim of the study

The aim of the study was to develop a framework for evaluating banking information systems in Nigeria. Based on critical data analysis, findings and interpretation, the answers to the research questions were derived. Based on this, a framework for the evaluation of banking information systems in Nigeria was developed and proposed. The framework can be used by the banks to guide the selection, deployment and evaluation of IT solutions that are used for their business processes and activities. This will enhance the quality of the services that are provided to their clients and business partners.

The framework took into consideration the culture and environment in which the banking IT solutions are implemented and use. Culture and environment can influence the success or failure of IT project. The culture and environment in combination with the identified factors enabled the study to propose a framework that is specific to the Nigeria banking environment and other developing countries with similar challenges.

7.4 Contribution of the study

The contribution of the study is presented in this section. The study contributed in three parts; theoretically, methodologically and practically.

7.4.1 Theoretical Contribution

Theoretically, the research contributed from the framework that was developed. The framework developed based on empirical findings can be used to enhance and support existing theories in IS studies especially in Nigeria and other developing countries with similar challenges. In addition, the study contributes to the existing literature in the areas of IS, banking information systems and ANT, particularly from the perspectives of Nigeria and developing countries where there exists very little literature about the phenomena being studied. In addition, the study adds to the existing literature in IS study. This is a major contribution to the existing literature in the areas of IS, banking information systems and actor-network theory (ANT). Particularly from the perspectives of Nigeria and other developing countries where there exists very little literature about the phenomena studied and the use of ANT to under-pin the analysis of empirical data.

Also, the study contributes theoretically to IS study from the perspective of the framework that was developed. The theory was developed based on empirical findings in two Nigeria banking

institutions where the phenomenon exists. The theory can be used to enhance and support existing theories in the IS studies.

7.4.2 Methodological Contribution

The study contributes methodologically from the perspective of how the four moments of translation, a tenet of ANT was used to analyse data that enabled the study develop an evaluation framework in a developing like Nigeria. How the theory was applied in the study is significant in that it enabled the adequate identification of the actors, networks and relationships that are involved in the selection, deployment and evaluation of the IT solutions that are used for banking services in Nigeria banks. The approach helped gain an understanding of the activities which include interactions and relationships that are inherent in the evaluation of IT solutions used by the Nigerian banks. This methodology is a major contribution in that it can be used as a guide for further IS study in developing countries like Nigeria.

7.4.3 Practically Contribution

Practically, the framework that was developed can be used by banks in Nigeria and other developing countries with similar challenges to guide the evaluation of IT solutions that are used for providing banking services. The framework can be used to identify and examine the factors that affect the selection, deployment and evaluation of IT solutions that are used. An understanding of the factors that challenge IT solutions' success is critical for the effectiveness, enhancement and support of the banking systems. The effectiveness of the IT solutions that are used by the banks will positively affect the quality of the services that are provided to the clients and business partners. The type of services provided to the clients and business partners are vital for the banks' competitiveness, profitability and sustainability.

7.5 Recommendation

Based on critical examination, the study identified some gaps that challenge the effective selection, deployment and consistent evaluation of the IT solutions that are used for banking activities. The study recommends that these gaps be given due attention and addressed by the Nigerian banks that use IT solution for their business processes and operations.

7.5.1 Evaluation Team

The study's findings revealed that the banking institutions used as cases in the study do not have team or unit that is dedicated to the evaluation of the IT solutions that are used for their

business processes and activities. In the absence of a dedicated team, evaluation tasks and responsibilities were often assigned to individuals and groups at the discretion of the IT managers. There was no pragmaticism in the way the managers assigned the tasks and responsibilities. As such there was no sequential order in which the tasks and activities were carried out. A lack of order or guidance of activities often lead to non-alignment of activities and loss of focus. This often negatively affect the activities' outcomes and goals.

The study recommends an establishment of team or unit that is dedicated to the evaluation of IT solutions that are selected and use for business activities and operations. This will enable focus and consistent evaluation of the IT solutions that are used in the provision of services. In addition, that will enhance the stock of knowledge which is currently lacking within the banks. For appropriateness, the team must be adequately trained. This is to avail the staff with the skill-set to carry the task and responsibility of evaluation of the IT solutions that are used. Right skill is critical for planning, structuring and making informed decisions in respect of the evaluation and management of the IT solutions implemented and use. Appropriate management of the IT solutions use will enhance the processes and activities that are involved in the delivery of services to the banks' clients and business partners.

7.5.2 Approach

The approach that is followed in the execution of task is critical for outcomes and meeting its objectives. This is because the approach defines the methodologies and techniques that are involved in meeting the objective. Methodologies consist of the methods and procedures that guide the steps that activities that are involved in the selection and evaluation of IT solutions need to follow. Techniques on the other hand defines the structure and unique sets of actions that are designed and use in addressing a specific task or addressing an objective. Planned and structured approach can enable focus, sequence and alignment of processes and activities. Alignment of activities to business operations is important for achieving an organisation's objectives holistically.

The study revealed that the approach that are used in the execution of tasks were random. Two approaches were randomly and commonly use in the execution of tasks; the top-down and bottom-up approach. Both approaches had their advantages and dis-advantages. To avail an organisation, the opportunity of the advantages and addressing the dis-advantages, the study recommends a unified approach. A unified will enables an all-encompassing approach that take into consideration the different aspects of the organisation all in one. This will help

address the disadvantages that challenge the objectives and goals of the organisation. For example, in information gathering and knowledge processing essential for the selection and evaluation of IT solutions, a unified approach will enable a wider gathering of information from both the lower and upper structure of the organisation. This will enable more informed decision making based on the wider consultation and bigger volume of information available. The approach need to take into consideration, the internal and external factors, processes and rules that govern activities in the environment. These considerations will enable for the development of an approach that are specific for the organisation's needs. Approaches that are specific will enable iteration and enhance governance.

7.5.3 Requirements

Requirements form the basis for the determination and validation of the IT solutions that are used for business processes and activities. The study revealed that requirements need to adequately identified and defined. Where requirements are not appropriately identified, defined or managed, it becomes a challenge for appropriate selection or evaluation of the IT solutions that are employed and used. In many organisations, EA is used to assess and gain an understanding of the both the business and IT architecture. IT architecture details the structure, interaction and the relationship that exist between the IT solutions that are used in an organisation. Business architecture details the structure and the processes that exist in business. An understanding of the IT architecture is critical for identifying the gaps that exist in the IT structure of an organisation. The identification of these gaps is critical for defining and generating requirements that are critical and specific for aligning IT solutions with business objectives.

The study recommends adoption of an enterprise architecture framework for governing the IT and business activities within the banking institutions. EA can be used to appropriately identify and define requirements that will enable the effective evaluation of the IT solutions that are used for business activities and processes.

7.6 Benefit of the study

The benefits of the study come in the form of its contributions to the body of knowledge and banking sector. The study provides benefits in theory and practice.

Theoretically, the study's outcomes form a reference point for IS study especially in developing countries like Nigeria. The theory adds to existing literature in the areas of IS, banking

information systems and actor-network theory. In theory, the study benefits IS researchers, practitioners and banking institutions that make use of IT solutions for their business processes and operations. This is because literature provides a basis for a research study both in academia and in the industry.

In practice, the framework that was developed and proposed can be used by Nigerian banks to guide the selection, deployment and evaluation of the IT solutions that are used to provide services. This includes using the framework to identify and understand the factors that influence the selection or evaluation of the IT solution that they employ for their business processes and operations. The appropriateness of IT solutions selected and use is critical for the quality of services that are provided to the clients and business partners. In the banking sector, the quality of services rendered has become a basis for competition advantage. Quality of services is vital for competitiveness, profitability and sustainability.

7.7 Further study

Banks in Nigeria are increasingly investing their financial resources in IT solutions. This is with the aim of remaining competitive, profitable and sustainable. The problem is that the IT solutions are not delivering the expected value to them. Both technical and non-technical factors challenge the effectiveness of the IT solutions use. In its subjectivity, the study explored the phenomenon from the angle of the selection, deployment and evaluation of the IT solutions that are used by the banks. The study was able to identify, examine and understand the factors that influence the banking IT solutions selection, deployment and evaluation in Nigeria. Based on the factors, a framework for the evaluation of banking information systems in Nigeria was developed and proposed.

The study recommends that further studies be carried out from other perspectives to ascertain and understand other factors that affect the effectiveness of banking information systems in Nigeria and other developing countries. This will enhance and support the effectiveness and competitiveness of the banks in developing countries like Nigeria. In addition, such studies will contribute to existing literature in IS study and body of knowledge.

7.8 Conclusion

The chapter concludes the study. The chapter presents the outcomes of the study which includes the evaluation of the study, benefits and recommendations. The evaluation of study detailed the rigor, strategies and approach that was involved in achieving the aim and

objectives the study. The chapter also detailed how the study was able to answer the research questions to achieve the study objectives. The benefits of the study were also discussed in the chapter. Finally, the study puts forward recommendations and the need for further studies. The study achieved its aim which was to develop a framework for the evaluation of banking information systems in Nigerian banks as presented in chapter 1 and 3.

References

Ababneh, H., Shrafat, F. & Zeglat, D. 2017. Approaching Information Systems Evaluation Methodology and Techniques: A Comprehensive Review. *International journal of Business Information Systems*, 24(1): 1–30.

Acha, I., Kanu, C. & Agu, G. 2017. Cashless Policy in Nigeria: The Mechanics, Benefits and Problems. *Innovative Journal of Economics and Financial Studies,* 1(1): 28-38.

Adams, E. 2010. The Joys and Challenges of Semi-Structured Interviewing. *Community practitioner: The Journal of the Community Practitioners' & Health Visitors' Association*, 83(7): 18-21.

Adekoya, O.D., Jimoh, I., Okorie, G. & Olajide, M. 2019. Significance of Employee Engagement and Individual Well-Being on Organisational Performance in Nigeria, *International Journal of Science and Management Studies,* 2(5): 35-47.

Adeniji, A.A. & Akinbode, O.J. 2018. Knowledge of banking services among frontline personnel and quality of service delivery in the Nigerian commercial bank. *Journal of Business and Retail Management Research*, *12*(3): 160-167.

Adhabi, E & Anozie, C. B. 2017. Literature Review for the Type of Interview in Qualitative Research. *International Journal of Education.* 9(3): 86-97.

Ahmadian, L., Nejad, S.S. & Khajouei, R. 2015. Evaluation methods used on health information systems (HISs) in Iran and the effects of HISs on Iranian healthcare: A systematic review. *International journal of medical informatics*, *84*(6): 444-453.

Ajah, A. I. 2016. The impact of network failure on cashless society in Nigeria and the way forward. *International Journal of Computer Application*, 3(4): 65-75.

Akintunde, O. A. 2016. Analysis of the adoption and usage of POS terminals by hotels in Jos Metropolis, North Central Nigeria. *Academic Open Business & Management Research Journal*, 1(1): 1-14.

Al Kilani, M. & Kobziev, V. (2016) An Overview of Research Methodology in Information System (IS). *Open Access Library Journal*, 3(11): 1-9.

Alamoudi, D. & Kumar, A. 2017. Information System Complexity and Business Value. *International Journal of Economic & Management Science*, 6(2): 1-4.

Aldarbesti, H., Goutas, L. & Sutanto, J. 2015. A Critical Examination of the Causes of Failed IS Implementation: A Review of the Literature on Power and Culture. In *HCI in Business: Second International Conference, HCIB 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015, Proceedings* (Vol. 9191, pp. 667-678). Springer International Publishing.

Alduraywish, Y., Xu, Y. & Salonitis, K. 2017. Evaluating state of information systems failure in developing countries using ITPOSMO model. In *23rd International Conference on Automation and computing (ICAC), Hudderfield, September 7-8, 2017, (pp.1-5). IEEE.*

Alexander, P. M. & Silvis, E. 2014. Towards extending actor-network theory with a graphical syntax for information systems research. *Information Research, 19*(2): 617-636.

Ali, P. I. & Emenike, K.O. 2016. Impact of automated teller machine on banking services delivery in Nigeria: a stakeholder analysis. *Brazilian Journal of Education, Technology and Society*, *9*(1): 64-72.

Aliyu, A.A., Bello, M.U., Kasim, R. and Martin, D., 2014. Positivist and non-positivist paradigm in social science research: Conflicting paradigms or perfect partners. *Journal of Management and Sustainability*, *4(3):* 79-95.

Alkoot, F.M., 2019. Using 6 Sigma to Improve Outcomes of Higher Education Institutes. *International Journal of Information and Education Technology*, *9*(1) 46-50.

Almalki, M., Al-fleit, S. & Zafar, A. 2017. Challenges in Implementation of Information System Strategies in Saudi Business Environment: A Case Study of a Bank. *International Journal of Computer Trends and Technology*, 43(1): 56-64.

Al-Mamary, Y.H., Shamsuddin, A., Hamid, A. & Aziati, N., 2014. The role of different types of information systems in business organizations: a review. *International Journal of research*, *1*(7):1279-1286.

Almigheerbi, T.S., Ramsey, D. & Lamek, A. 2019. Evaluation of the Performance of Information Systems Implemented at the University of Tripoli, Libya. In *Proceedings of the 11th International Conference on Knowledge Management and Information Systems, Vienna University of Technology, Vienna, Austria, September 17-19, 2019.* (pp. 203-211).

Almutairi, H. & Subramanian, G. H. 2005. An empirical application of the Delone and Mclean model in the Kuwaiti private sector. *Journal of Computer Information Systems*, 45(3): 113–122.

Angolia, M. & Reed, A.H., 2016. Preparing Undergraduates for Project Management on the Manufacturing Shop Floor. *Journal of Technology, Management & Applied Engineering*, *32*(2): 2-24.

Al-Saadi, H., 2014. Demystifying Ontology and Epistemology in research methods. *Research Gate*, 1(1):1-10.

Alsaawi, A. 2014. A Critical Review of Qualitative Interviews. *European Journal of Business and Social Sciences*, (3)4: 149-156.

AlWreikat, L., AlShawa, A., Al-Rimawi, D. & Fraihat, S. 2019. Business intelligence and data analytics system for mobile money. In *Proceedings of the Second International Conference on Data Science, E-Learning and Information Systems, Dubai, December 2-5, 2019,* (pp. 1-6). ACM.

Amin, H. J., Onyeukwu, P. E. & Osuagwu, H. I. 2018. E–Banking, Service Quality and Customer Satisfaction in Selected Nigerian Banks. *International Journal of Innovation and Economic Development*, *4*(2): 51-57.

Antwi, S.K. and Hamza, K., 2015. Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European Journal of Business and Management*, *7*(3): 217-225.

Arif, S., Sidek, S. & Abu Bakar, N. 2017. Actor-Network Theory as an Interpretative Tool to Understand the Use of Online Technologies: A Review. *Asian Journal of Information Technology*, 16(1): 61-68.

Asiyanbi, H. & Ishola, A., 2018. E-banking services impact and customer satisfaction in selected bank branches in Ibadan metropolis, Oyo state, Nigeria. *Accounting*, *4*(4):153-160.

Atkinson, P. A. & Coffey, A. J. 2011. 'Analysing documentary realities', In: D. Silverman. (ed.), *Qualitative Research.* London: Sage Publications Ltd. (pp.56-75).

Avgerou, C. & Walsham, G. 2017. *Information Technology in Context: Studies from the Perspective of Developing Countries: Studies from the Perspective of Developing Countries*. New York, NY: Routledge.

Avgerou, C. 2008. Information Systems in Developing Countries: A Critical Research Review. *Journal of Information Technology*, 23(3): 133-146

Avgerou, C., Hayes, N. & La Rovere, R. L. 2016. Growth in ICT uptake in Developing Countries: New users, new uses, new challenges. *Journal of Information Technology*, 31(4): 329-333.

Azrioual, S. & Brundel, C. 2018. *The Acceptance of Mobile Banking by Organizations: An exploratory study on mobile banking and factors influencing its acceptance by organizations*. Master's degree Thesis within Business Administration, Jonkoping University, Jonkoping.

Babatunde, A. H. & Ishola, A. 2018. E-banking services impact and customer satisfaction in selected bank branches in Ibadan metropolis, Oyo state, Nigeria. *Accounting*. 4(4): 153 - 160.

Bacon-Shone, J. 2015. *Introduction to Quantitative Research Methods*. Hong kong: Graduate School, The University of Hong Kong.

Bailey, J.E. & Pearson, S.W., 1983. Development of a tool for measuring and analyzing computer user satisfaction. *Management science*, *29*(5): 530-545.

Balasubramanian, S., Jagannathan, V. & Natarajan, T. 2014. Information systems success in the context of Internet banking: Scale development. *The Journal of Internet Banking and Commerce*, *19*(3): 1-15.

Bankole, F.O., Bankole, O.O. & Brown, I., 2017. Influences on cell phone banking adoption in South Africa: An updated perspective. *Journal of Internet Banking and Commerce*, *22*(3):1-16.

Baporikar, N. 2016. Information and Communication Technology for SMEs' Competitiveness. *International Journal of Strategic Information Technology and Applications (IJSITA)*, *7*(3): 41-55.

Barratt, M., Choi, T.Y. & Li, M., 2011. Qualitative case studies in operations management: Trends, research outcomes, and future research implications. *Journal of Operations Management*, *29*(4):329-342.

Barta, G. & Gorcsi, G. 2019. Assessing and managing business risks for artificial intelligence based business process automation. In *International Scientific Conference Contemporary*

Issues in Business, Management and Economics Engineering, Vilnius, Lithuania. May 9–10 May 2019. (pp:823-832).

Basias, N. & Pollalis, Y. 2018. Quantitative and qualitative research in business & technology: Justifying a suitable research methodology. *Review of Integrative Business and Economics Research*, 7: 91-105.

Basole, A. & Ramnarain, S. 2016. Qualitative and ethnographic methods in economics. In: Lee, F.S. & Cronin, B. (Eds.), *Handbook of Research Methods and Applications in Heterodox Economics*, Massachusetts: Edward Elgar Publishing. (pp.135-64).

Baxter, P. & Jack, S. 2008. Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, *13*(4): 544-559.

Benaroch, M. & Chernobai, A. 2017. Operational IT Failures, IT Value Destruction, and Board-Level IT Governance Changes. *MIS Quarterly*, 41(3): 729-762.

Bencherki, N. 2017. *Actor–Network Theory*. In Craig Scott & Laurie Lewis (eds.). The International Encyclopedia of Organizational Communication. New York, NY: Wiley.

Benedict, N. 2016. Defining of Evaluation Stage in Business (Turn Down of an Organisation). Retrieved from https://www.academia.edu/28458754/DEFINING OF EVALUATION STAGES IN BUSINESS.docx [May 9, 2019].

Ben-Eliyahu, A. 2014. *On Methods: What's the difference between qualitative and quantitative approaches?* Retrieved from https://chronicle.umbmentoring.org/on-methods-whats-the-difference-between-qualitative-and-quantitative-approaches/ [5 July 2018].

Bengtsson, F. & Ågerfalk, P.J. 2016. Sustaining sustainability: Investigating the long-term effects of a sustainability initiative. In *Scandinavian Conference on Information Systems,* Ljungskile, Sweden, August 7-10, 2016. (pp. 86-99). Springer, Cham.

Berg, B. L. 2007. *Qualitative research methods for the social sciences.* London: Pearson.

Berg, B. 2004.*Qualitative research methods for the social sciences* (5th ed.). Boston: Pearson

Berghout, E. & Remenyi, D. 2005. The eleven years of the European conference on IT evaluation: retrospectives and perspectives for possible future research. *The Electronic Journal of Information Systems Evaluation*, 8(2): 81–98.

Bernard, H.R. & Bernard, H.R. 2013. *Social research methods: Qualitative and quantitative approaches*. London: Sage.

Blumberg, B., Cooper, D. R. & Schindler, P. S. 2005. *Business Research Methods*. McGraw Hill: Berkshire.

Boman, S.A., Tijani, B.M. and Orji, M.G., 2018. Effect of Micro Finance Banks on Economic Development of Kaduna State, Nigeria. *European Business & Management*, *4*(5): 112-118.

Boumlik, A.& Bahaj. M. 2018. Big Data and IoT: A Prime Opportunity for Banking Industry. In: Ezziyyani M., Bahaj M., Khoukhi F. (eds), *Advanced Information Technology, Services and Systems. AIT2S 2017*. Lecture Notes in Networks and Systems, vol 25. Springer, Cham

Bourezk, H., Acha, N. & Barka, H., 2020. Factors Influencing Moroccan Individual Investor Behavior: Survey Evidence. *IJBTSR International Journal of Business and Technology Studies and Research*, *2*(1):1-13.

Brinkmann, S., 2014. Unstructured and semi-structured. *The Oxford handbook of qualitative research*, pp.277-299. London: Oxford University Press.

Bronte-Stewart, M. 2015. Beyond the iron triangle: Evaluating aspects of success and failure using a project status model. *Computing & Information Systems*, *19*(2): 19-36.

Bruno, E., Iacoviello, G. & Lazzini, A., 2016. The adequacy of information systems for supporting the asset quality review process in banks. Evidence from an Italian Case Study. In *Strengthening Information and Control Systems*, 14: 59-75. Springer, Cham.

Bryman, A. 2016. Social Research Methods. 5th ed. United Kingdom: Oxford University Press.

Bryman, A. 2012. *Social Research Methods*. (4th ed). New York: Oxford University Press.

Bryman, A. & Bell, E. 2011. *Business Research Methods. (*3rd edition). Oxford University Press.

Budiwati, C. & Kurniasih, L. 2014. Analysis of Mobile Banking (M-Banking) Success Using a Respecification of Delone & Mclean Information Success Model (Case Study at Permata Bank, Surakarta, Indonesia). *International Proceedings of Economics Development and Research*, 76(15): 78-82.

Burns, N. S. & Grove. K. 2010. The practice of Nursing Research. Texas: Saunders.

Burke, D. & Kovela, S. 2017. ITMA - IT Integration in Mergers and Acquisitions. *International Journal of Business and Management*, 12(11): 16-40.

Burodo, M.S., Suleiman, S. & Shaba, Y., 2019. Queuing Theory and ATM Service Optimization: Empirical Evidence from First Bank Plc, Kaura Namoda Branch, Zamfara State. *American Journal of Operations Management and Information Systems*, *4*(3):80-86.

Callon, M. (1991). Techno-economic networks and irreversibility. In J. Law (Ed.), *A sociology of monsters? Essays on power, technology and domination*. London: Routledge. (pp. 132-161).

Callon, M. 1986. The Sociology of an Actor-Network: The Case of the Electric Vehicle. *Mapping the Dynamics of Science and Technology*. Callon, M., Law, J. and Rip, A. (Eds). Macmillan Press, London. (pp: 19-34).

Callon, M. 1999. Actor-network theory—the market test. *The Sociological Review*, *47*(1_suppl): 181-195.

Campanella, F., Della Peruta, M. R. & Del Giudice, M. 2017. The effects of technological innovation on the banking sector. *Journal of the Knowledge Economy*, *8*(1): 356-368.

Canals, L. 2017. Instruments for Gathering Data. In E. Moore & M. Dooly (Eds.), *Qualitative approaches to research on plurilingual education*. Spain:Research-publishing.net.

Cecez-Kecmanovic, D., Galliers, R.D., Henfridsson, O., Newell, S. & Vidgen, R. 2014. The sociomateriality of information systems: current status, future directions. *Mis Quarterly*, *38*(3): 809-830.

Central Bank of Nigeria. 2018. Central Bank of Nigeria Financial Report. Retrieved from www.cenbankng.org [10 May 2019].

Ceric, A. 2015. Bringing together evaluation and management of ICT value: a systems theory approach. *Electronic Journal of Information Systems Evaluation*, *18*(1): 19-35.

Chamberlain, K. 2015. Epistemology and Qualitative Research. In: P. Rohleder & A. C. Lyon, Eds., *Qualitative Research in clinical and health psychology*. UK: Palgrave MacMillan.

Chan, C.H. & Fu, K.W. 2018. The "mutual ignoring" mechanism of cyberbalkanization: triangulating observational data analysis and agent-based modelling. *Journal of Information Technology & Politics*, *15*(4): 378-387.

Chang, J.C.J. & King, W. R. 2005. Measuring the performance of information systems: A functional scorecard. *Journal of Management Information Systems,* 22(1): 85–115.

Chaysin, P., Daengdej, J. & Tangjitprom, N. 2016. Survey on Available Methods to Evaluate IT Investment. *The Electronic Journal Information Systems Evaluation*, 19(1):71-82).

Check J. & Schutt R. K. 2012. Survey research. In: J. Check, R. K. Schutt., editors. *Research methods in education*. Thousand Oaks, CA: Sage Publications; pp. 159–185.

Chen, S., Osman, M., Nunes, J.M.B. & Peng, G.C. 2011. *Information systems evaluation methodologies*. In; *Proceedings of the IADIS International Workshop on Information Systems Research Trends*, Approaches and Methodologies (ISRTAM), Rome, Italy. 20 July 2011.

Chiedu, C.K., Long, C.S. & Ashar, H.B. 2017. The Relationship Among Job Satisfaction, Oreganizational Commitment and Employees' Turnover at Unilever Corporation in Nigeria. *European Journal of Multidisciplinary Studies*, *2*(5): 370-383.

Chitanana, L. & Govender, D.W. 2018. Tracing sources of design uncertainty and controversy in Web 2.0 facilitated collaborative design process. *The African Journal of Information Systems*, *10*(2): 105-119.

Choo, C.W. 2000. Working with knowledge: how information professionals help organisations manage what they know, *Library Management*, (21) 8: 395-403.

Chung, S. H., Ahmad, S. I. & Tang, H. L. 2015. Symptoms, causes and remedies for failures in enterprise systems implementation. *International Journal of Business Information Systems*, *19*(1): 103-118.

Clarke, R. 2017. Content Analysis in Support of Critical Theory Research: How to Deliver an Unwelcome Message Without Being Shot. *In Proceedings of 30th Bled Econference: Digital Transformation – From connecting Things to Transforming our Lives, Bled, Slovenia*. *June18-21, 2017.* (pp. 88-110).

CompTIA. 2018. *IT Industry Outlook 2018*. Retrieved from https://www.comptia.org/resources/it-industry-trends-analysis [30 May 2018].

Costa, C. & Cunha, P. 2015. The social dimension of business models: an Actor-Network Theory perspective. In *Twenty-first Americas Conference on Information Systems, Puerto Rico,* August 13-15, 2015. (pp. 1-12).

Coughlan, T., Collins, T.D., Adams, A., Rogers, Y., Haya, P.A. & Martin, E. 2012. The conceptual framing, design and evaluation of device ecologies for collaborative activities *International Journal of Human–Computer Studies,* 70(2): 765-779.

Cram, W. A., Proudfoot, J. G. & D'Arcy, J. 2017. Organizational information security policies: a review and research framework. *European Journal of Information Systems*, *26*(6): 605-641.

Cresswell, K. M., Worth, A. & Sheikh, A. 2010. Actor-Network Theory and its role in understanding the implementation of Information Technology developments in healthcare. *BMC Medical Informatics and Decision Making,* 10(1): 1-11.

Creswell, J. W. & Creswell, J. D. 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, LA: Sage publications.

Creswell, J. W. 2014. *Research design: Qualitative, Quantitative, and Mixed Methods approaches, 4th ed.* Thousand Oaks, California: Sage Publications.

Creswell, J. W. 2013. *Qualitative inquiry and research design: Choosing among five approaches*. 3rd ed. Thousand Oaks, CA: Sage.

Creswell, J.W. 2012. Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th Ed). Boston: Pearson.

Cronholm, S. & Gobel, H. 2016. Evaluation of the Information Systems Research Framework: Empirical Evidence from a Design Science Research Project. *The Electronic Journal Information Systems Evaluation,* 19(3): 158-168.

Cronholm, S. & Goldkuhl, G. 2003. Strategies for information systems evaluation: six generic types. *Electronic Journal of Information Systems Evaluation*, 6(2): 65-74.

Crowther, D. & Lauesen, L. M. 2017. Introduction*. Handbook of Research Methods in Corporate Social Responsibility*. Edward Elgar Publishing.

Dandira, M. 2012. Strategy in crisis: knowledge vacuum in practitioners. *Business Strategy Serie,* 13(3): 128-135.

Das, R., Tarafder, M.K. & Nahar, N. 2016. Research Methods Persistent in Social Science Research. *International Journal of Innovative Science, Engineering & Technology*, 4(1): 5-15.

David-West, O., Umukoro, I.O. & Muritala, O., 2018. Adoption and Use of Mobile Money Services in Nigeria. In *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2724-2738). IGI Global.

Davis, F. D. 1986. A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results, Doctoral Dissertation, Sloan School of Management, Massachusetts Institute of Technology, 1986.

Dayour, F. 2018, September. Backpackers' perceptions of risk towards smartphone usage and risk reduction strategies, Ghana. In *Proceedings of ENTER2018 PhD Workshop*, Jonkoping, Sweden, January 23-26, 2018. (pp. 1-9.)

De Carolis, D. & Deeds, D. 1999. The implication of stocks and flows of organizational knowledge on firm performance: An empirical investigation on the biotechnology industry. *Strategic Management Journal,* 20(6): 953-968.

De Vos, A., Delport, C. S. L., Fouche, C. B. & Strydom, H. 2011. Research at Grass Roots: A primer for the social science and human professions.4th ed. Pretoria: Van Schaik.

De Waal, A. & van der Heijden, B. 2016. Increasing customer loyalty and customer intimacy by improving the behavior of employees. *Journal of Strategy and Management*, *9*(4): 492-510.

DeLone, W.H. & McLean, E.R. 2016. Information Systems Success Measurement. *Foundations and Trends in Information Systems*, 2(1): 1-116.

Delone, W.H. & McLean, E.R., 2003. The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4): 9-30.

DeLone, W.H. & McLean, E.R., 1992. Information systems success: The quest for the dependent variable. *Information systems research*, *3*(1): 60-95.

DeWalt, K. M. & DeWalt, B. R. 2002. *Participant observation: A guide for fieldworkers* (2nd Ed.). Walnut Creek, California: AltaMira Press.

Dharni, K. 2014. Exploring information system evaluation in Indian manufacturing sector. *International Journal of Business Information Systems*, 17(4): 453–468.

Dikko, M. 2016. Establishing construct validity and reliability: Pilot testing of a qualitative interview for research in Takaful (Islamic insurance). *The Qualitative Report* 21(3): 521-528.

Doll, W.J. & Torkzadeh, G. 1998. Developing a multidimensional measure of systems use in an organizational context. *Information & Management,* 33(4): 171–185.

Du Plessis, C.D. 2017. The method of psychobiography: Presenting a step-wise approach. *Qualitative Research in Psychology*, *14*(2): 216-237.

Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. 2013. *Fundamentals of business process management*. Berlin: Springer Berlin Heidelberg.

Dutta, C. 2016. Banking Failures: *Why these are happening, and how they will carry on without the necessary investment in testing and infrastructure*. Retrieved from https://internationalbanker.Com/banking/banking-failures-happening-will-carry-without-necessary-investment-testing-infrastructure [24 April 2018].

Dwivedi, Y.K., Janssen, M., Slade, E.L., Rana, N.P., Weerakkody, V., Millard, J., Hidders, J. & Snijders, D. 2017. Driving innovation through big open linked data (BOLD): Exploring antecedents using interpretive structural modelling. *Information Systems Frontiers*, *19*(2): 197-212.

Dwivedi, Y. K., Wastel, D., Laume, S., Henriksen, H., Z., Myers, M. D., Bunker, D., Elbanna, A., Ravishankar, M., N. & Srivastava, C. S. 2015. Research on information systems failures

and successes: status update and future directions. *Information Systems Frontiers*, 17(1): 143-157.

Dwivedi, Y.K., Henriksen, H.Z. & Wastell, D. eds., 2013. *Grand Successes and Failures in IT: Public and Private Sectors. In IFIP WG 8.6 International Conference on Transfer and Diffusion of IT, TDIT 2013, Bangalore, India, June 27-29, 2013, Proceedings* (Vol. 402). Springer.

Easterbrook, S., Singer, J., Storey, M. & Damian, D. 2008. Selecting empirical methods for software engineering research. *In: Guide to advanced empirical software engineering. Springer.* (pp.285–311).

Ebad, S. A. 2018. An exploratory study of ICT projects failure in emerging markets. *Journal of Global Information Technology Management*, *21*(2), 139-160.

Effah, J. 2012. Mobilizing Culture for E-Business in Developing Countries: An Actor Network Theory Account. *The Electronic Journal of Information Systems in Developing Countries*, *52*(1):1-18.

Ehijiele, E., Basil, A. & Sina, A.M. 2018. The Effect of Electronic Banking on Customer Satisfaction in Nigeria. *International Journal for Social Studies*, *4*(4): 33-41.

Eisenhardt, K.M. & Graebner, M.E., 2007. Theory building from cases: Opportunities and challenges. *Academy of management journal*, *50*(1): 25-32.

Ekuobase, G.O. & Olutayo, V.A., 2016. Study of Information and Communication Technology (ICT) maturity and value: The relationship. *Egyptian Informatics Journal*, *17*(3): 239-249.

Ekwonwune, E. N., Egwuonwu, D. U., Elebri, L. C. & Uka, K. K. 2016. ICT as an Instrument of Enhanced Banking System. *Journal of Computer and Communications*, *5*(1): 53-60.

Elbanna, A. 2011. Applying Actor-network theory and managing controversy. In YK Dwivedi & Wade M., Eds., *Information Systems Theory: Explaining and Predicting Our Digital Economy*. New York, NY: Springer.

Elder-Vass, D. 2019. Actor-network theory. In: Atkinson, P.A. et al. (eds.), *SAGE Encyclopedia of Research Methods*. Sage Publication.

Enoruwa, K. O., Ezuem, D.M. & Nwani, C.O. 2019. *Electronic Channels and Bank Performance: Empirical Evidence from Nigeria. SSRG International Journal of Economics and Management Studies,* 6(5): 37-46.

Eriksson, P. & Kovalainen, A. 2015. *Qualitative methods in business research: A practical guide to social research*. Sage.

Ewusi-Mensah, K. 2003. *Software development failures: anatomy of abandoned projects*. Cambridge, Mass: MIT Press.

Frisk, J.E., Bannister, F. & Lindgren, R., 2015. Evaluation of information system investments: a value dials approach to closing the theory-practice gap. *Journal of Information Technology*, *30*(3): 276-292.

Gaaloul, K. & Molnar, W. 2014, November. Research Methodologies in Enterprise Engineering: Insights from a Workshop. In *2014 International Workshop on Advanced*

Information Systems for Enterprises, Tunis, Tunisia, November 10-12, 2014. (pp. 58-64). IEEE.

Gable, G. G., Sedera, D. & Chan, T. 2008. Re-conceptualizing information system success: The IS-impact measurement model. *Journal of the Association for Information Systems*, 9(7): 377–408.

Gable, G., Sedera, D. & Chan, T. 2003. Enterprise Systems Success: A Measurement Model. In *Proceedings of the 24th International Conference on Information systems*. Association for Information Systems. Seattle, USA. 14-17 Dec. 2003. (pp. 576-591).

Galletta, A., 2013. *Mastering the semi-structured interview and beyond: From research design to analysis and publication*. NYU press.

Ganesh, L. & Mehta, A. 2010. Critical Failure Factors in Enterprise Resource Planning Implementation at Indian SMEs, *Asian Journal of Management Research*, 1(1): 44-57.

Gardner, M. 2016. *The biggest threat to banks? Legacy systems not Fintech*. Retrieved from https://www.theglobeandmail.com/report-on-business/rob-commentary/the-biggest-threat-to-banks-legacy-systems-not-fintech/article32967786/ [9 June 2018].

Gartner Group, 2002. IT Spending: Its History and Future. Retrieved from www.gartnergroup.com [20 May 2018].

Gatautis, R., Medziausiene, A., Tarute, A. & Vaiciukynaite, E. 2015. Towards ICT impact framework: Private and public sectors perspective. *Journal of Economics, Business and Management*, *3*(4): 465-469.

Gbadegeshin, S. A., Oyelere, S. S., Olaleye, S. A., Sanusi, I. T., Ukpabi, D. C., Olawumi, O. & Adegbite, A. 2019. Application of information and communication technology for internationalization of Nigerian small-and medium-sized enterprises. *The Electronic Journal of Information Systems in Developing Countries*, *85*(1): 1-17.

Gentles, S. J., Charles, C., Ploeg, J. & McKibbon, K. 2015. Sampling in Qualitative Research: Insights from an Overview of the Methods Literature. The Qualitative Report, 20(11): 1772-1789.

Georgescu, M. & Jeflea, V. 2015. The particularity of the banking information system. *Procedia Economics and Finance,* 20: 268-276.

Gillham, B. 2000. *Case Study Research Methods*. London: Continuum

Gioia, D.A., Corley, K.G. and Hamilton, A.L. 2013. Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational research methods*, *16*(1): 15-31.

Giri, S. & Shakya, S. 2018. ICT and Service Delivery Mechanism in Civil Service of Nepal. *International Journal of Computer Science and Mobile Computing*, *7*(4): 47-52.

Goldkuhl, G. 2019. The Generation of Qualitative Data in Information Systems Research: The Diversity of Empirical Research Methods. *Communications of the Association for Information Systems*, 44: 572 – 599.

Goldkuhl, G. 2012. Pragmatism vs interpretivism in qualitative information systems research.

European journal of information systems, 21(2): 135-146.

Goldkuhl, G. & Lagsten, J. 2012. Different roles of evaluation in information systems research. In *Workshop on IT Artefact Design and Work Practice Intervention, Barcelona, Spain.* 10 June 2012, (pp. 1-13).

Gomes, J. & Romao, M. 2015. Gaining competitive advantage through the Balanced Scorecard. In *Encyclopedia of Information Science and Technology, Third Edition.,* (pp. 5046-5055). IGI Global.

Gong, Y., & Janssen, M. (2019). The value of and myths about enterprise architecture. *International Journal of Information Management*, *46:* 1-9.

Goodhue, D.L. & Thompson, R.L. 1995. Task-technology fit and individual performance. *MIS quarterly*, 19(2): 213-236.

Govender, D. W. & Chitanana, L. 2016. Perceptions of Information and Communications Technology (ICT) for Instructional Delivery at a University: From Technophobic to Technologically Savvy. *The African Journal of Information Systems*, 8(2): 70-85.

Govender, N. M. & Pretorius, M. 2015. A critical analysis of information and communications technology adoption: The strategy-as-practice perspective. *Acta Commercii*, *15*(1): 1-13.

Gunawong, P. & Gao, P. 2010. Challenges of e-government in developing countries: actor-network analysis of Thailand's smart ID card project. In *Proceedings of the 4th ACM/IEEE international conference on information and communication technologies and development, London, United Kingdom, December 13-16, 2010.* (pp. 1-9).

Gyanath, H.K. & Amrithlal, M.P. 2017. An Exploration of the Use of Online Technology to Improve the Recruitment and Selection Process at a TVET College. *Journal of Marketing and HR(JMHR)*, Volume 5, Issue 1: 235-258.

Hadi, M.J. 2020. Exploring the Teaching and Learning Belief of an Indonesian English Teacher. *JOLLT Journal of Languages and Language Teaching*, *8*(1): 29-39.

Hammersley, M. 2013. What is Qualitative Research? London and New York: Bloomsburry.

Hanell, S.M., Nordman, E.R., Tolstoy, D. & Ozbek, N. 2019. It's a new game out there: e-commerce in internationalising retail SMEs*. International Marketing Review*, 37(3):515-531.

Harriet, E.E.U., Oluseye, O.O., Omotayo, A. & Augustina, D. 2017. Queuing Theory Perspective in e-Banking and Service Performance: A Conceptual Approach. *Asian Journal of Information Technology*, *16*(6): 364-373.

Harry, R., Sewchurran, K. & Brown, I. 2014. Introducing a mobile payment system to an emerging economy's mobile phone subscriber market. An actor network perspective. *The Electronic Journal of Information Systems in Developing Countries*, *62*(1): 1-26.

Hawking, P., Foster, S. & Stein, A. 2005. ERP II & change management: the real struggle for ERP systems practices. In: *Managing Business with SAP: Planning Implementation and Evaluation* (pp. 179-197). IGI Global.

Heeks, R. & Stanforth, C. 2015. Technological change in developing countries: opening the black box of process using actor–network theory. *Development Studies Research: An Open Access Journal,* 2(1): 33-50.

Heeks, R. 2006. Health information systems: Failure, success and improvisation. *International Journal of Medical Informatics*, 75(2): 125-137.

Heeks, R. 2002. Information systems and developing countries: failure, success and local Improvisations. *The Information Society*, 18(2): 101-112.

Henningsson, P., Yetton, P. & Wynne, P. 2018. A Review of Information System Integration in Mergers and Acquisitions. *Journal of Information Technology*: *33*(4): 255-303.

Henttonen, K., Rissanen, T., Eriksson, P. & Hallikas, J., 2017. Cultivating the wisdom of personnel through internal crowdsourcing. *International Journal of Information Technology and Management*, *16*(2): 117-132.

Herbst, N.R, Kounev, S. & Reussner, R. 2013. Elasticity in Cloud Computing: What It Is, and What It Is Not. *In Proceedings of the 10th International Conference on Autonomic Computing*, San Jose, CA, USA. June 24-28, 2013. (pp. 23–27).

Hirst, P. 2000. Democracy and governance. In J. Pierre (ed.), *Debating governance: Authority, steering and democracy*. Oxford: Oxford University Press.

Holstrom, J. & Robey, D. 2005. 'Inscribing organizational change with information technology: an actor network theory approach', in B Czarniawska and T Hernes (eds), *Actor-network Theory and Organizing*, Copenhagen Business School Press, Copenhagen.

Hou, C., Wang, J. & Chen, C., 2018. Using Hierarchical Scenarios to Predict the Reliability of Component-Based Software. *IEICE TRANSACTIONS on Information and Systems*, *101*(2): 405-414.

Hussain, Z., Das, D., Bhutto, Z. A., Hammad-u-Salam, M., Talpur, F. & Rai, G. 2017. E-Banking Challenges in Pakistan: An Empirical Study. *Journal of Computer and Communications,* 5:1-6.

Ibanichuka, E.A.L & Oko, I. A. 2019. Electronic Fraud and Financial Performance of Quoted Commercial Banks in Nigeria. *International Journal of Advanced Academic Research*, 5(4): 15-35.

Ibitoye, T. A. & Ajayi, O. A. 2001. *Elements of Banking*. Bash-Moses Printing Company, Ibadan.

Iivari, J. 2005. An empirical test of the DeLone-McLean model of information system success. *ACM SIGMIS Database*,36(2): 8-27.

Ikpefan, O. A., Akpan, E., Godswill, O. O., Grace, E. & Chisom, N. 2018. Electronic Banking and Cashless Policy in Nigeria, *International Journal of Civil Engineering and Technology,* 9(10): 718–731.

Ilo, J.V., Wilson, A. & Nnanyelugo, S. 2014, January. Impact of technological innovation on delivery of banking services in Nigeria. In:*14th International Conference on Economics, Education and Humanities, Bali, Indonesia. December 10-11, 2014.* pp. 162-168.

Irani, Z. 2008. Information systems evaluation: what does it mean?. *Construction innovation*, *8*(2): 88-91.

Isibor, A. A., Omankhanlen, A. E., Okoye, L. U., Achugamonu, B. U., Adebayo, M. E., Afolabi, G. T. & Ayodeji, O. E. 2018. Impact of Electronic Banking Technology on Customers' Satisfaction and Economic Growth in Nigeria*, International Journal of Civil Engineering and Technology*, 9(12): 536–544.

Islam, T., Manivannan, D. & Zeadally, S. 2016. A classification and characterization of security threats in cloud computing. *International Journal of Next-Generation Computing*, *7*(1): 1-20.

Iyamu, T. 2015. *Application of underpinning theories in information systems.* Heidelberg Press, Australia, Victoria.

Iyamu, T. & Sekgweleo, T. 2013. Information Systems and Actor-Network Theory Analysis. *International Journal of Actor-Network Theory and Technological Innovation*, 5(3): 1-11.

Iyamu, T., Hamunyela, S. & Mkhomazi, S.S. 2014. Rethinking the Roles of Actors in the Mobility of Healthcare Services. In *Proceedings of International Working Conference on Transfer and Diffusion of IT, Aalborg, Denmark, June 2-4, 2014*. (pp. 261-276). Springer,Springer, Berlin, Heidelberg.

Jaafreh, A. B. 2017. Evaluation Information System Success: Applied DeLone and McLean Information System Success Model in Context *Banking System in KSA. International Review of Management and Business Research Journal,* 6(2): 829-845.

Jain, E. & Yadav, A. 2017. Marketing and Technology: Role of Technology in Modern Marketing. *IOSR Journal of Business and Management*, *19*(5):49-53.

Jegede, C. A. (2014). Effects of automated teller machine on the performance of Nigerian banks. *American Journal of Applied Mathematics and Studies*, 2: 40-46.

Jessen, J. D. & Jessen, C. 2014. Games as Actors - Interaction, Play, Design, and Actor Network Theory. *International Journal on Advances in Intelligent Systems,* 7(3-4): 412-422.

Jeston, J. and Nelis, J. 2008. *Business Process Management*. Practical Guidelines to Successful Implementations, Elsevier, Oxford.

Jiang, J., McPherson, J., Wittman, A., Limarta, S., Wang, T. H., Pessey, J. & Tippayasawate, P. 2014. How businesses fail in managing technology: A review of the literature. In *Proceedings of PICMET'14 Conference: Portland International Center for Management of Engineering and Technology; Infrastructure and Service Integration, Kanazawa, Japan, July 27-31, 2014.* (pp. 585-597). IEEE.

Johnson, O. & Iyamu, T. 2019. Framework for the adoption of e-commerce: A case of South African retail grocery sector. *The Electronic Journal of Information Systems in Developing Countries*, *85*(5): 1-12.

Johnston, A. C. & Hale, R. 2009. Improved Security Through Information Security Governance. *Communications of the ACM*, 52(1): 126–129.

Johnston, K.A., Loot, M. & Maxine, P. 2016. The business value of cloud computing in South Africa. *The African Journal of Information Systems*, *8*(2): 1-20.

Kalaiarasi, H., Lakshmi, P. and Stephan, A., 2017. Adoption of self-service banking channels-the case of mobile banking in India. *International Journal of Business Information Systems*, *26*(1): 1-14.

Kanobe, F., Alexander, P. M. & Bwalya, K. J. 2017. Policies, regulations and procedures and their effects on mobile money systems in Uganda. *The Electronic Journal of Information Systems in Developing Countries*, 83(1): 1–15.

Kaplan, B. & Maxwell, J. A. 2005. Qualitative Research Methods for Evaluating Computer Information Systems. In *Evaluating the Organizational Impact of Healthcare Information Systems*. New York, NY: Springer.

Karim, S., Gide, E., Sandu, R. & Al Tawara, A. 2018. Analysing Bangladeshi Consumers' Satisfaction and Preferences of E-banking Services in Small to Mid-Sized Enterprises (SMEs). *Global Journal of Information Technology: Emerging Technologies*, *8*(2):62-74.

Karoulis, A., Demetriadis, S. & Pombortsis, A. 2006. Comparison of expert-based and empirical evaluation methodologies in the case of a CBL environment: the ''Orestis'' experience. *Computers and Education*, 47(2): 172-185.

Katz-Buonincontro, J. & Anderson, R.C., 2018. A review of articles using observation methods to study creativity in education (1980–2018). *The Journal of Creative Behavior, 54*(3): 508-524.

Kawtar, I., Karim, D. & Salah, B. 2019. Proposal model of change for Business IT Alignment. *Procedia Computer Science*, *164*: 96-104.

Khan, H.U. & Ejike, A. C. 2017. An assessment of the impact of mobile banking on traditional banking in Nigeria*. International Journal of Business Excellence*, 11: 446-463.

Khan, S. 2019. Urban Agriculture: A Review of Prospects and Challenges. In *International Conference on Innovative Research in Agriculture, Engineering, Technology, Applied Sciences, Humanities and Business Management for Sustainable Development, Delhi, India, November 23, 2019. (*pp 40-45*).*

Kida, M.I. & Goyal, A. 2018. Challenges of cashless banking system: Empirical study of selected banks in Nigeria and the State of Rajasthan, India. *International Journal of Research and Analytical Reviews*, *5*(3): 735-741.

Kivunja, C. & Kuyini, A. B. 2017. Understanding and Applying Research Paradigms in Educational Contexts. *International Journal of Higher Education,* 6(5): 26-41.

Klakegg, O.J., 2016. Ontology and epistemology. In *Designs, Methods and Practices for Research of Project Management,* pp. 87-96. Routledge.

Klimontowicz M. & Derwisz K. 2016. Mobile Technology on Retail Banking Market. In: *European Financial Systems 2016. In proceedings of the 13th International Scientific Conference,* Brno, Czech Republic, June 27-28, 2016. (pp. 322-330).

Kothari, C. R. 2008. Research methodology: Methods and techniques. (2nd Ed), Nairobi, Kenya: New Age International Publishers

Kreps, G.L. 2014. Evaluating health communication programs to enhance health care and health promotion. *Journal of health communication*, *19*(12):1449-1459.

Krishna, V. R. 2015. Impact of Information and Communication Technology (Ict) On Indian Banking Sector. *Voice of Research*, *3*(4): 54-58.

Kulkarni, U., Ravindran, S. & Freeze, R. 2007. A knowledge management success model: theoretical development and empirical validation. *Journal of Management Information Systems,* 23(3): 309–347.

Kumar, B.P. & Ramesh, D.B. 2015. Challenges posed by Private Technical Institutions of ODISHA in Application of ICT: A Librarian's Approach. *Journal of Library, Information and Communication Technology*, *5*(3-4): 96-106.

Kumar, R. & Maheshwary, P. 2015. Impact of Information Communication Technology for Development and Digital Era: A Literature Review. *International Journal of Research in Electronics and Computer Engineering,* 3: 126-129.

Kumar, R. L. 2004. A framework for assessing the business value of information technology infrastructures. *Journal of Management Information Systems*, 21(2): 11–32.

Kupfer, A., 2018. Research Methods in the Information Systems Discipline: A Literature Analysis of Conference Papers. In *Twenty-fourth Americas Conference on Information Systems,* New Orleans, USA, August 16-18, 2018. (pp.1-10).

Kwayu, S., Lal, B., & Abubakre, M. (2018). Enhancing organisational competitiveness via social media-a strategy as practice perspective. *Information Systems Frontiers*, *20*(3), 439-456.

Lapukeni, A. F. 2015. Financial Inclusion and the Impact of ICT: An Overview. *American Journal of Economics*, *5*(5): 495-500.

Latour, B. 2005. *Reassembling the social: An introduction to actor-network-theory*. New York: Oxford University Press.

Latour, B. 1999. *Pandora's hope: Essays on the reality of science studies*. Cambridge: Harvard University Press.

Latour, B. 1987. *Science in Action - How to Follow Scientists and Engineers Through Society.* Harvard University Press, Cambridge, MA.

Latour, B. 1986. *The Powers of Association,* In Power, Action and Belief: a new sociology of knowledge (Ed, Law, J.) Routledge & Kegan Paul plc. (pp. 264-280).

Law, J. 1999. After ANT; Complexity, Naming and Topology. In Actor Network Theory and After, edited by J. Law & J.Hassard, pp.1–14. Oxford: Blackwell.

Law, J & Callon, M. 1992. 'The Life and Death of an Aircraft: A Network Analysis of Technological Change'. In Bijker, W.E. & Law, J. (eds.), *Shaping Technology/ Building Society: Studies in Sociotechnical Change*. Cambridge, MA: The MIT Press. (pp. 21-52).

Lawal, T. T., Lawal, N. A. & Akanbi, A. A. 2018. An Evaluation of the Legal and Regulatory Challenges of Electronic Banking System in Nigeria. *Journal of Business and Finance Management Research,* 4(3): 21-29.

Lee, N.C. & Wang, E.T., 2016. Translation to Inter-Organisational Systems Integration: The Effect of Power and the Mediating Role of the Obligatory Passage Point. *Pacific Asia Journal of the Association for Information Systems*, 8(3): 45-76.

Lee, W. K., Leong, C. F., Lai, W. K., Leow, L. K. & Yap, T. H. 2018. ArchCam: Real time expert system for suspicious behaviour detection in ATM site. *Expert Systems with Applications*, 109: 12-24.

Leedy, P.D. & Ormrod, J.E. 2014. Qualitative research. *Pracfical research: Planning and design*, pp.141-172.

Lei, J., Guan, P., Gao, K., Lu, X., Chen, Y., Li, Y. & Zheng, K. 2014. Characteristics of health IT outage and suggested risk management strategies: An analysis of historical incident reports in China. *International Journal of Medical Informatics*, 83(2): 122-130.

Lelissa, T., 2019. Panel Data Analysis on the Impact of Industry and Macroeconomic Factors on Bank Performance: The Case of Ethiopia. *European Journal of Business and Management,* 11(10): 1-11.

Liberti, J. M. & Petersen, M. A. 2018. Information: Hard and soft. *Review of Corporate Finance Studies*, *8*(1):1-41.

Liebana-Cabanillas, F., Munoz-Leiva, F., Sanchez-Fernandez, J. & Viedma-del Jesus, M. I. 2016. The moderating effect of user experience on satisfaction with electronic banking: empirical evidence from the Spanish case. *Information Systems and e-Business Management*, *14*(1): 141-165.

Lincoln, C.Y.S. & Guba, E.G., 2009. The Only Generalization is: There is no Generalization. *In: Gomm, R., Hammersley, M., Foster, P. (Eds.), Case Study Method*. Sage Publications. (pp. 27–45).

Lindawati, M. 2020. Review of Good Corporate Governance (GCG) Application in Operational Activities in PT Bank Central Asia. *International Journal of Education Management and Social Science*, *1*(6): 867-877.

Lobaziewicz, M. 2016. The role of ICT solutions in the intelligent enterprise business activity. In *2016 Federated Conference on Computer Science and Information Systems,* Gdansk, Poland, September 11 - 14, 2016. (pp. 1335-1340). IEEE.

Lourenco, R. F. & Tomael, M. I. 2018. Actor-network theory and cartography of controversies in Information science. *Transinformacao*, 30(1): 102-140

Love, P.E., Zhou, J., Matthews, J. & Lou, H., 2016. Object oriented modeling: Retrospective systems information model for constructability assessment. *Automation in Construction*, *71:* 359-371.

Luo, L., Kennedy, M., Brancolini, K. & Stephens, M., 2017. Developing Online Communities for Librarian Researchers: A Case Study. *College & Research Libraries*, *78*(4): 512-526.

Madden, R. 2010. *Being ethnographic: A guide to the theory and practice of ethnography*. London: Sage Publications.

Madonsela, N. S., Mbecke, P. & Mbohwa, C. 2013. Improving the South African manufacturing sector's competitiveness through the adequate use of ICT. *International Conference on Information Technology and Computer Systems Engineering.* Johannesburg, South Africa. November 27-28, 2013. (pp. 39-73).

Mahajan, S.S. and Ranade, M.R.R., 2019. Awareness of Electronic Banking among Customers in Kolhapur City. *NOLEGEIN-Journal of Management Information Systems*, 2(2):16-20.

Malmi, T. 2016. Managerialist studies in management accounting: 1990–2014. *Management Accounting Research*, 31: 31-44.

Mardiana, S., Tjakraatmadja, J.T. & Aprianingsih, A. 2018. How Organizational Culture Affects Information System Success: The Case of an Indonesia IT-Based Company. *Journal of Information Systems Engineering and Business Intelligence*, 4(2): 84-95.

Mardis, M.A., Hoffman, E.S. and Rich, P.J., 2014. Trends and issues in qualitative research methods. In *Handbook of research on educational communications and technology* (pp. 173-193). Springer, New York, NY.

Markovic, M. R. & Salamzadeh, A. 2018. The importance of Communication in Business Management, Entreneurship and Entrepreneurial Tendencies, p.11.

Martin, N. C., Diliora, I., Eugene, F., Chukwunonso S. O., Michelle, S., & Maham, S. 2018. A Theoretical Insight on E-Banking (Internet Banking) Framework in Developing Countries. In *Proceedings of the 17th International Conference on e-Learning, e-Business, Enterprise Information Systems, and e-Government (EEE)*, The Steering Committee of the World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp), Nevada, USA., July 30 – August 02, 2018. (pp. 68-75).

Martensson, P., Fors, U., Wallin, S.B., Zander, U. & Nilsson, G.H. 2016. Evaluating research: A multidisciplinary approach to assessing research practice and quality. *Research Policy*, *45*(3): 593-603.

Mashabela, F. & Pillay, A.S. 2017. Effectiveness of an integrated tertiary software mobile information system for student registration and admission at a university in Gauteng. *Expert Journal of Business and Management*, 5(1): 32-49.

Mason, R. O. 1978. Measuring Information Output: A Communication Systems Approach," *Information & Management*, 1(5): 219-234.

Maxwell, J. A. 2012. *A realist approach for qualitative research*. London: Sage.

Mazikana, A.T., 2019. Internal and External Factors Are There, Organizations Be Alert When Developing an Information Systems Strategy. *Organizations Be Alert When Developing an Information Systems Strategy*. Retrieved from http://dx.doi.org/10.2139/ssrn.3488081 [14 November, 2020].

McCusker, K. & Gunaydin, S. 2015. Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, *30*(7):.537-542.

McDermott, F. 2012. Researching groupwork. *Groupwork*, *15*(1): 90-108.

Merriam, S., B. 2009. *Qualitative research. A guide to design and implementation*, (2nd edn.). San Francisco, CA: Jossey-Bass.

Merriam, S. B. & Tisdell, E. J. 2016. Qualitative research: A guide to design and implementation (4th edn.). San Francisco, CA: Jossey-Bass.

Messiou, K., 2019. Collaborative action research: facilitating inclusion in schools. *Educational Action Research*, *27*(2): 197-209.

Meyer, J. A., Lubbe, S. & Klopper, R., 2015. ICT Investment Effectiveness in The South African Post Office: Reconsidering the Approaches of the past 20years. *The African Journal of Information Systems*, *7*(3): 27-51.

Milani, F., Dumas, M., Ahmed, N. and Matulevičius, R., 2016. Modelling families of business process variants: a decomposition driven method. *Information Systems*, *56:* 55-72.

Miles, M. B., & Huberman, A. M. 1994. Qualitative data analysis: An expanded source book (2nd ed.). Thousand Oaks, CA: Sage.

Mitchell, A. 2018. A Review of Mixed Methods, Pragmatism and Abduction Techniques. *The Electronic Journal of Business Research Methods,* 16(3): 103-116.

Mkpojiogu, E. O. & Asuquo, A. 2018. The user experience of ATM users in Nigeria: a systematic review of empirical papers. *Journal of Research in National Development*, 16(1): 115-125.

Mohd Tobi, S. U. 2012. *Research Methodological Cage: Understanding the Qualitative Viewpoint*. Kuala Lumpur: Aras Publisher.

Mojtahed, R., Nunes, M.B., Martins, J.T. & Peng, A. 2014. Equipping the constructivist researcher: The combined use of semi-structured interviews and decision-making maps. *Electronic Journal of Business Research Methods*, *12*(2): 87-95.

Moslehi, F., Haeri, A.R. & Moini, A.R. 2018. Analyzing and investigating the use of electronic payment tools in Iran using data mining techniques. *Journal of AI and Data Mining*, *6*(2): 417-437.

Mpazanje, F., Sewchurran, K. & Brown, I. 2013. Rethinking Information Systems Projects Using Actor-Network Theory: A Case of Malawi. *The Electronic Journal of Information Systems in Developing Countries*, *58*(1):1-32.

Muawanah, U. & Gunadi, G. 2018. Information Technology Adoption, Corporate Governance, and Bank Performance. *Journal of Information Systems Engineering and Business Intelligence: 4(1):*.11-17.

Muller, M. & Schurr, C. 2016. *Assemblage thinking and actor‐network theory: conjunctions, disjunctions, cross‐fertilisations*, Transactions of the Institute of British Geographers, 41(3): 217-229.

Muthanna, A. 2019. Critical qualitative inquiry and methodological awareness: The effectiveness of face-to-face interviews in changing/enhancing participants' beliefs and practices. *International Journal of Research*, *8*(2): 59-66.

Myers, M.D. & Newman, M., 2007. The qualitative interview in IS research: Examining the craft. *Information and organization*, *17*(1): 2-26.

Nadler, D. & Tushman, M. 1983. A general diagnostic model for organizational behavior: Applying a congruence perspective. In J. R. Hackman, E. Lawler, & L. Porter (Eds.), *Perspectives on behavior in organizations* (pp. 112-124). New York: McGraw Hill.

Naidoo, R. 2019. Guidelines for Designing an Interpretive Case Study for Business and Management. In:*18th European Conference on Research Methodology for Business and Management Studies, Johannesburg, South Africa, June 20-21, 2019.* (p. 256).

Ndofirepi, T.M. & Rambe, P. 2016. The entrepreneurial orientation of college students in a struggling economy context. *Journal of Contemporary Management*, *13*(1): 1332-1363.

Nehemia-Maletzky, M., Iyamu, T. & Shaanika, I. 2018. The use of activity theory and actor network theory as lenses to underpin information systems studies. *Journal of Systems and Information Technology* 20(2): 191-206.

Nguyen, T. D., Nguyen, T. M. & Cao, T. H. 2015. Information systems success: a literature review. In *International Conference on Future Data and Security Engineering.* (pp. 242-256). Springer, Cham.

Niemi, E., & Pekkola, S. (2019). The benefits of enterprise architecture in organizational transformation. *Business & information systems engineering*, 62(6):585–597.

Nikpay, F., Ahmad, R., Rouhani, B.D. & Shamshirband, S. 2016. A systematic review on post-implementation evaluation models of enterprise architecture artefacts. *Information Systems Frontiers*, *22*(3): 789-789.

Niranjan, S., Niroj, P., Dipak, S., Raju, B. & Rajesh, S. 2018. Role of Information Communication Technology (ICT) in Nepalese Banking Industry. *American Scientific Research Journal for Engineering, Technology, and Sciences*, 42(1): 75-88.

Njie, B. & Asimiran, S. 2014. Case study as a choice in qualitative methodology. *Journal of Research & Method in Education*, *4*(3): 35-40.

Njoku, N.A., Ewe, U.C. & Alio, A.N. 2017. Strategies for Improving the Use of information and Communication technology (ICT) in the Teaching and Learning of Electronic Works in Technical Colleges in Rivers State. *Journal of Research in Science and Technology Education*, *7*(2): 86-96.

Nkiru, N., Sidi, C.P. & Abomeh, S. 2018. Impact of Information and Communication Technology on the Performance of Deposit Money Banks in Nigeria. *International Journal of Management*, *7*(4): 225-239.

Obeng, A. Y. & Mkhize, P. L. 2017. An exploratory analysis of employees and customers' responses in determining the technological innovativeness of banks. *The Electronic Journal of Information Systems in Developing Countries*, *80*(1):1-23.

Ochara, N.-M., Kandiri, J., & Johnson, R. (2014). Influence processes of implementation effectiveness in challenged information technology projects in Africa. *Information Technology & People*,27(3), 318–340.

Odawa, J., Otanga, D. & Wabwoba, F. 2014. Effective Business Process Automation through Process Reengineering: Case of Public a University in Kenya. *International Journal of Information and Communication Technology Research*, 4(6):.247-254.

Ofanson, E. J., Aigbokhaevbolo, O. M. & Enabulu, G. O. 2010. The financial system in Nigeria: An overview of banking sector reforms. *Ambrose Ali University Journal of Management Sciences,* 1(1): 17.

Ogunfuwa, I. 2018. Banks recorded 200,284 failed instant e-transactions on Monday. P*unch Nigeria*. [online] 6th February. Retrieved from https://punchng.com/banks-recorded-200284-failed-instant-e-transactions-on-monday/ [12 March. 2018].

Okechi, O. & Kepeghom, O. M. 2013. Empirical evaluation of customers' use of electronic banking systems in Nigeria. *African Journal of Computing & ICT,* 6(1): 7-20.

Oliveira, P. & von Hippel, E. 2011. Users as service innovators: The case of banking services. *Research policy*, *40*(6): 806-818.

Ololade, B. & Ogbeide, S., 2017. E-banking in Nigeria: issues and challenges. *Research journal of finance and accounting*, *8*(6):16-24.

Oluwatolani, O., Abah, J. & Achimugu, P. 2011. *The Impact of Information Technology in Nigeria's Banking Industry. Journal of Computer Science and Engineering,* 7(2):63-67.

Onatu, G.O. 2013. Building Theory from Case Study Research: The unanswered questions in social sciences. In *Proceedings in GVW-the 1st Global Virtual Conference-Workshop* (Vol 1), April 8-12, 2013.

Ormston, R., Spencer, L., Barnard, M. & Snape, D. 2014. The foundations of qualitative research. *Qualitative research practice: A guide for social science students and researchers*, *2:*52-55.

Otaokpukpu, J.N., Usman, U.A. & Abdulrazaq, A.S. 2019. Achieving Financial ainclusion in Nigeria Through Microfinance banks and Cooperative Synergy. International Journal of Arts, Languages and Business Studies, 2(1): 92-97.

Ozkul, A.E., Tufan, H. & Ozsezer, M., 2018. Analysis of candidate teachers' opinions of history course books printed after 2009. *Quality & Quantity*, *52*(1): 439-450.

Paledi, V.N. & Alexander, P.M. 2017. Actor-Network Theory to Depict Context-Sensitive M-Learning Readiness in Higher Education. *The Electronic Journal of Information Systems in Developing Countries*, *83*(1): 1-26.

Pandey, P. & Pandey, M, M. 2015. *Research Methodology: Tools and Techniques*. Romania: Bridge Center.

Pant, A., Shrestha, A., Kong, E. and Ally, M., 2018. A systematic literature mapping to investigate the role of IT in knowledge stock and transfer. In *Proceedings of the 22nd Pacific Asia Conference on Information Systems, Yokohama, Japan*. June 26-30, 2018. (pp.166-174).

Pascoa, C. & Tribolet, J. 2014. *Actor Network Theory Applied to Organizational Change: A Case Study*. In Jamil, G.L., Malheiro, A. & Ribeiro, F. (eds.), *Rethinking the Conceptual Base for New Practical Applications in Information Value and Quality,* (pp.233-248). Hershey: Information Science Reference.

Patten, M.L. and Newhart, M., 2017. *Understanding research methods: An overview of the essentials*. Routledge.

Pejovic, I. 2016. Challenges of Modern Electronic Banking. In *Sinteza 2016-International Scientific Conference on ICT and E-Business Related Research*, *Singidunum, Serbia*, 2016. April 22, 2016. (pp. 442-447).

Petter, S., DeLone, W. & McLean, E. R. 2013. Information systems success: The quest for the independent variables. *Journal of Management Information Systems*, 29(4): 7–62.

Pham, T.A.N., Li, X., Cong, G. & Zhang, Z. 2016. A general recommendation model for heterogeneous networks. *IEEE Transactions on Knowledge and Data Engineering*, *28*(12): 3140-3153.

Pitt, L. F., Watson, R. T., & Kavan, C. B. 1995. Service quality: A measure of information systems effectiveness. *MIS Quarterly*, 19(2): 173–187.

Plataniotis, G., De Kinderen, S., Ma, Q. & Proper, E. 2015. A conceptual model for compliance checking support of enterprise architecture decisions. In *IEEE 17th Conference on Business Informatics*, *Lisbon, Portugal, July 13-16, 2015*. (Vol. 1, pp. 191-198). IEEE.

Porra, J., Hirschheim, R. and Parks, M.S. 2014. The historical research method and information systems research. *Journal of the Association for Information Systems*, *15*(9): 536-576.

Price, R. & Shanks, G. 2016. A semiotic information quality framework: development and comparative analysis. In *Enacting Research Methods in Information Systems* (pp. 219-250). Palgrave Macmillan, Cham.

Punch, K.F. 2013. *Introduction to social research: Quantitative and qualitative approaches*. sage.

Quaglio, G., Karapiperis, T., Putoto, G., Delponte, L., Micheletti, G., Brand, H., Bertinato, L., Tomson, G., Bonnardot, L. & Zanaboni, P. 2016. Strengthening EU policies in support of ICT for development: Results from a survey of ICT experts. *Health Policy and Technology*, *5*(4): 330-340.

Rahi, S. 2017. Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instruments Development. *International Journal of Economics & Management Sciences*, 6(2): 1-5.

Rai, A., Lang, S. S.& Welker, R. B. 2002. Assessing the validity of IS success models: An Empirical Test and Theoretical Analysis. *Information Systems Research*, 13(1): 50–69.

Rajesh, R. & Palpandi, A. 2015. A Study on Impact of Information Technology in Banking Sector with Reference to Southern Tamilnadu. In *Proceedings of the International Conference on Inter Disciplinary Research in Engineering and Technology,* New Delhi, India. April 29-30, 2015. (pp.17-22).

Reeves, S., Peller, J., Goldman, J. & Kitto, S. 2013. Ethnography in qualitative educational research: AMEE Guide No. 80. *Medical teacher*, *35*(8): 1365-1379.

Rehman, A.A. & Alharthi, K. 2016. An Introduction to Research Paradigms. *International Journal of Educational Investigations,* .3(8): 51-59.

Reynolds, G.W. & Stair, R.M. 2016. *Fundamentals of Information Systems*. Cengage Learning.

Rizk, Y., Isahagian, V., Boag, S., Khazaeni, Y., Unuvar, M., Muthusamy, V. & Khalaf, R. 2020. A Conversational Digital Assistant for Intelligent Process Automation. In *International Conference on Business Process Management, Sevilla, Spain, September 13-16, 2020.* (pp. 85-100). Springer, Cham.

Rouse, M. 2016. *Data Collection*. Retrieved from https://searchcio.techtarget.com/definition/data-collection [20 August 2018].

Rovai, A.P., Baker, J.D. & Ponton, M.K. 2014. *Social Science Research Design and Statistics*. Chesapeake, VA: Watertree Press LLC.

Rong, H., Wu, X.K. & Boeing, P. (2017), The effect of institutional ownership on firm innovation: evidence from Chinese listed firms, *Research Policy*, 46(9): 533-1551.

Rubin, A. & Babbie, E. 2010. *Essential research methods for social work*. New York: Brooks/Cole Cengage Learning.

Sabherwal, R. 1999. The relationship between information system planning sophistication and information system success: An empirical assessment. *Decision Sciences*, 30(1): 137–167.

Saha, A.R. & Rahman, M.M. 2018. Automated Teller Machine Card Fraud of Financial Organizations in Bangladesh. *Journal of Computer Science Applications and Information Technology,* 3(1): 1-6.

Saleem, F., Salim, N., Altalhi, A.H., Abdullah, A.L., Ullah, Z., Baothman, F.A. & Junejo, M.H. 2016. Comparative study from several business cases and methodologies for ICT project evaluation. *International Journal of Advanced Computer Science & Applications*, *1*(7): 420-427.

Sapkotaa, N., Paudelb, N., Dipak Kumar Subedic, Raju Bhattaraid, Rajesh Shresthae. 2018. Role of Information Communication Technology (ICT) in Nepalese Banking Industry. *American*

Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS), 42(1): 75-88.

Saravani, Z., Tash, M.N.S. & Mahmodpour, K.., 2015. Evaluation of Bank Market Share and Its Affective Determinants: Sepah Bank. *International Research Journal of Applied and Basic Sciences*, 9(7):1003-1009.

Sargolzaie, A. R., Siavashi, R. & Bahmaei, R., 2015. Structural-Cultural Factors of Private Banks Success in providing e-Banking Services. *International Journal of Academic Research in Business and Social Sciences*, *5*(9):179-187.

Sarowar, M.G., Khan, A., Shakil, M.H. & Ullah, M.A. 2018. Survey on Perception of People Regarding Utilization of Computer Science & Information Technology in Manipulation of Big Data, Disease Detection & Drug Discovery. *Journal of Advances in Computer Engineering and Technology*, *4*(4): 237-246.

Saunders, M., Lewis, P. & Thornhill, A. 2017. *Research Methods for Business Students*. Business and Economics. Prentice Hall.

Saunders, M., Lewis, P. & Thornhill, A. 2016. Research methods for business students (Seventh). *Nueva York: Pearson Education*.

Saunders, M., Lewis, P. & Thornhill, A. 2012. *Research Methods for Business Students (6th ed.)*. Harlow, Essex, UK. Pearson Education Limited.

Saunders, M., Lewis, P. & Thornhill, A., 2009. *Research methods for business students*.5th edition. Essex: Pearson Education Limited.

Seddon, P. B. 1997. A Re-specification and extension of the DeLone and McLean model of IS success*. Information Systems Research*, 8(3): 240–253.

Seddon, P. B. & Kiew, M.Y. 1994. A Partial Test and Development of the DeLone and McLean Model of IS Success*. In Proceedings of the International Conference on Information Systems*, *Vancouver, Canada, December 14-17, 1994.* (pp. 99-110).

Seddon, P., Staples, S., Patnayakuni, R. & Bowtell, M. 1999. Dimensions of Information Systems Success. *Communications of the Association for Information Systems*, 2(20): 1-61.

Sedera, D., & Gable, G. 2004. A factor and structural equation analysis of the enterprise systems success measurement model. In *Proceedings of the 37th Hawaii international conference on system sciences (HICSS 04),* Hawaii, USA. January 5-8, 2004. (pp. 676-682). Association for Information Systems.

Sekaran, U., & Bougie, R. 2012. *Research methods for business: A skill building approach (6th ed.).* West Sussex, UK: John Wiley & Sons Ltd.

Sekgweleo, T., Makovhololo, P. & Iyamu, T. 2017. The connectedness in selecting socio-technical theory to underpin information systems studies. *Journal of Contemporary Management,* 14(1): 1097–1117.

Sepehr, G. & Reihaneh, H. 2011. Using Actor-Network Theory to identify the role of IT in cognitive science in Iran. *Procedia - Social and Behavioral Sciences*, 32: 153 – 162.

Shaanika, I. & Iyamu, T. 2015. Deployment of enterprise architecture in the Namibian government: The use of activity theory to examine the influencing factors. *The Electronic Journal of Information Systems in Developing Countries*, *71*(1): 1-21.

Shaanika, I. & Iyamu T. 2014. Developing Enterprise Architecture Skills: A Developing Country Perspective. In: Passey D, Tatnall A. (eds.). Key Competencies in ICT and Informatics. Implications and Issues for Educational Professionals and Management (ITEM 2014). In *IFIP Conference on Advances in Information and Communication Technology*, Potsdam, Germany. July 1-4, 2014. (Vol 444: 52-61). Springer, Berlin, Heidelberg.

Shannon, Claude E. & Warren Weaver. 1949. *A Mathematical Model of Communication*. Urbana, IL: University of Illinois Press.

Sharma, S., Gangwar, R. & Krishna, A. 2016. Employee's Perspective: Reasons of Service Failure in Banking Sector. *IOSR Journal of Business and Management,* 18(11): 95-98.

Shepherd, M., 2015. Interview methods for project management research. In Pasian. E (ed.), *Designs, methods and practices for research of project management*. UK: Routledge. (pp.185-202).

Shim, Y. & Shin, D. 2019. Smartness in techno-nationalism? Combining actor-network theory and institutionalization to assess Chinese smart TV development. *Technological Forecasting and Social Change*, *139:* 87-98.

Shim, Y. & Shin, D.H. 2016. Neo-techno nationalism: The case of China's handset industry. *Telecommunications Policy*, *40*(2-3), pp.197-209.

Shin, D.H. 2016. Application of actor-network theory to network neutrality in Korea: Socio-ecological understanding of network dynamics. *Telematics and Informatics*, *33*(2): 436-451.

Shrafat, F., Ababneh, H. & Alrawabdeh, W. 2016. How information system investment evaluation is being initiated: an actor network theory perspective. *International Journal of Business Information Systems*, *22*(3): 259-279.

Shrafat, F.D., Akhorshaideh, A., Abdallah, A.B. & Al-Zu'bi, Z. 2016a. Understanding formality and informality in information system pre-evaluation (ISIE) process: examining case research from an actor network theory ANT perspective. *Journal of Management Research*, *8*(1): 77-109.

Singh, A.S. 2014. Conducting case study research in non-profit organisations. Qualitative Market Research: *An International Journal*, 17(1):77-84.

Siqueira, E. S., De Souza, C. A. & Barbosa, A. F. 2019. Using a digital divide index among enterprises in the context of public policies in Brazil. *The Electronic Journal of Information Systems in Developing Countries*, 2:1-12.

Soomro, A., Hisbani, F., Mallah, I.A., Abro, Q., Rehman, L. & Mahar, P.R. 2020. Importance of chemical laboratories in public schools authorized by higher education institutions: A case study of school students and teachers, *North American Academic Research.3(6): 112-128*.

Song, X. & Letch, N. 2012. Research on IT/IS Evaluation: A 25 Year Review. The *Electronic Journal Information Systems Evaluation,* 5(3): 276-287.

Stair, R. & Reynolds, G. 2017. *Fundamentals of information systems*. Boston, Massachusetts: Cengage Learning.

Standish Group. 2014. The Standish Group Report-Chaos. Retrieved from https://www. projectsmart .co.uk/white -papers/chaos-report.pdf [23 April 2018].

Standish Group. 2016. *Standish CHAOS Summary Report*. Retrieved from www.standish /reports /reports.php [24 May 2018].

Starr, M.A., 2014. Qualitative and mixed-methods research in economics: surprising growth, promising future. *Journal of Economic Surveys*, *28*(2), pp.238-264.

Stockdale, R. & Standing, C. 2006. An interpretive approach to evaluating information systems: A content, context, process framework. *European Journal of Operational Research*, 173:1090-1102

Stratemeyer, A. W., Geringer, S. D. & Canton, A., 2014. An exploratory investigation of the effects of service failures and recovery efforts on customer satisfaction. *American Journal of Management*, *14*(3): 20-28.

Susilo, D., Wahyudi, S. & Demi Pangestuti, I.R. 2020. Profitability determinants of manufacturing firms in Indonesia. *International Journal of Economics and Business Administration,* 8(2): 53-64.

Syed, H. & Sudhakar, K.F. 2017. Exploring How Gender and Age Influences Online Shopping behavior making a Comparison Between two Online Sellers in India. International Journal of Engineering Technology Science and Research, 4(10): 612-618.

Tadayon, N., 2016. Evaluating Program Assessment Report. *In Proceedings of the International Conference on Frontiers in Education: Computer Science and Computer Engineering (FECS)*, Pennsylvania, USA, October 12-15, 2016). (pp. 173).

Tatnall, A. & Gilding, A. (1999). Actor-Network Theory and Information Systems Research. In *the processing of the 10th Australasian Conference on Information Systems (ACIS),* Wellington, New Zealand. December 1-3, 1999. (pp. 955-966).

Thakur, M. S. 2018. The Impact of Information Technology Advancement in Indian Banking Sector. *International Journal of Engineering Technology Science and Research*, 5(1): 833-841.

Thissen, W.A. & Twaalfhoven, P.G., 2001. Towards a conceptual structure for evaluating policy analytic activities. *European Journal of Operational Research*, *129*(3): 627-649.

Tipi, L., Xiao, Y., Sukunar, A. & Edgar, D., 2017. Factors influencing people's intention to adopt e-banking: an empirical study of consumers in Shandong Province, China. *Asian Journal of Computer and Information Systems*, *5*(3): 26-43.

Tiwari, R. & Kumar, R. 2012. Information Technology in Banking Sector. *Asia Pacific Journal of Marketing and Management Review*, 1(1): 1-9.

Triche, J. & Walden, E. 2018. The Use of Impression Management Strategies to Manage Stock Market Reactions to IT Failures. *Journal of the Association for Information Systems*, *19*(4): 333-357.

Trigo, A., Varajao, J., Soto-Acosta, P., Gonzalvez-Gallego, N. and Castillo, F. J. M. 2015. Influence of firm size on the adoption of enterprise information systems: insights from Iberian firms. *International Journal of Information Technology and Management*, *14*(4): 233-252.

Troshani, I. & Wickramasinghe, N., 2014, January. Tackling complexity in e-health with actor-network theory. In *47th Hawaii International Conference on System Sciences, Hawaii, USA., January 6-9, 2014.* (pp. 2994-3003). IEEE.

Trusko, B., 2016. Ethnography. In *The Innovation Tools Handbook, Volume 3* (pp. 135-150). Productivity Press.

Tworek, K. 2018. Information systems reliability in the context of higher education institutions. *In EDULEARN18 conference Proceedings*, Palma de Mallorca, Spain, July 2-4, 2018. (pp. 9419-9428). IATED Academy.

Twum-Darko, M. & Harker, L.A.L., 2017. Understanding knowledge sharing in an organization: A perspective of actor-network theory. *International Journal of Knowledge Management*, *13*(1): 53-74.

Twum-Darko, M., Noruwana, N. & Sewchurran, K., 2015. Theoretical interpretation of e-government implementation challenges in South Africa: a case study of a selected provincial government. *Journal of Governance and Regulation,* 4(1): 175-185.

Udo, E.E.U., Kabir, A.A. & Yusuff, A.M., 2017. Impact of Automated Teller Machine on Customer Satisfaction and Profitability of Commercial Banks. *International Journal of Banking and Finance Research*, 3(2):15-28.

Vahedi, R., Lotfi, F.H. & Najafi, S.E. 2016. Promote Mobile Banking Services by using National Smart Card Capabilities and NFC Technology. Journal of *Information Systems & Telecommunication*, 4(3): 174-181.

Vaitha, J.K. & Francis, N.J. 2016. Approaches to IT Service Management in Improving IT Management in the Banking Sector–A Case Study in Tanzanian Banks. In *the Fourth International Conference on Digital Information Processing, E-Business and Cloud Computing (DIPECC2016), Kuala Lumpur, Malaysia, September 6-8, 2016.* (pp. 1-14).

van de Wetering, R. and Mikalef, P., 2017, June. The effect of strategic alignment of complementary IT and organizational capabilities on competitive firm performance. In *International Conference on Business Information Systems*, Poznan, Poland, June 28-30, 2017. (pp. 115-126). Springer, Cham.

Van der Waldt, G. 2017. Theories for research in Public Administration. *African Journal of Public Affairs*, 9(9): 183-202.

Vanpoucke, E., Vereecke, A. & Wetzels, M. 2014. Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach. *Journal of Operations Management*, 32(7): 446–461.

Venable, J., Pries-Heje, J. & Baskerville, R. 2016. FEDS: a framework for evaluation in design science research. *European Journal of Information Systems,* 25(1): 77-89.

Viardot, E., 2017. Why Sustainable Firms Have a Superior Management of Capabilities? In: *The Timeless Principles of Successful Business Strategy* (pp. 37-48). Springer, Berlin, Heidelberg.

Vidgen, R. 1997. Stakeholders, soft systems and technology: separation and mediation in the analysis of information system requirements. *Information Systems Journal*, *7*(1): 21-46.

Visser, M., Van Biljon, J. & Herselman, M. 2013. Evaluation of management information systems: A study at a Further Education and Training college. *SA Journal of Information Management* 15(1): 1-8

Viswambari, M. & Selvi, D.R.A. 2014. Data Mining Techniques to Predict Weather: A Survey. *International Journal of Innovative Science, Engineering & Technology*, *1*(4): 450-452.

Wach, E. & Ward, R., 2013. Learning about qualitative document analysis. *IDS Practice Papers in Brief 13*. (pp. 1-5). Retrieve from www.ids.ac.uk [23 July, 2020].

Walliman, N. 2017. *Research methods: The basics*. London: Routledge.

Walliman, N. 2011. *Research Methods: The Basics*. New York, NY: Routledge.

Walton, J., 2013, September. The obligatory passage point: abstracting the meaning in tacit knowledge. In *Proceedings of the 14th European Conference on Knowledge Management,* Kaunas, Lithuania, September 5-6, 2013. (Vol. 2, pp. 769-775). Academic Conferences and Publishing International Limited.

Wan Park, S., Mesicek, L., Shin, J., Bae, K., An, K. & Ko, H., 2020. Customizing intelligent recommendation study with multiple advisors based on hierarchy structured fuzzy-analytic hierarchy process. *Concurrency and Computation: Practice and Experience*. Retrieve from https://doi.org/10.1002/cpe.5930 (wileyonlinelibrary.com/journal/cpe) [November 10, 2020].

Wan, A.Y., Ip, M.P. & Cheng, P.K. 2016. Guanxi and relationship marketing: An anthropological case study of China's foreign banks. *Journal of China Marketing*, *6*(1): 47-77.

Wang, J., Luo, S. & Yuan, J., 2019. Analysis of computer network and communication system. *Journal of Networking and Telecommunications*,1(1): 7-12.

Williamson, K. & Johanson, G. eds. 2017. *Research Methods: Information, Systems, and Contexts*. UK: Chandos Publishing.

Wolff, S. 2004. Analysis of Documents and Records. In Flick. U., Von Kardoff, E., & Steinke. I (Eds.), *A companion to qualitative research.* (pp: 284-289). London: Sage publications

Xu, Z., Brown, D. H., & Stevenson, M. 2016. ES adoption in Chinese SMEs: Institutional effects on users and providers. In the proceeding of *UK Academy for Information Systems Conference,* Oxford, UK. April 11-13, 2016. (PP: 1-23).

Xuemin, Z., Zhiming, S. & Ping, G., 2012. The process of information systems architecture development. *Procedia Engineering*, 29: 775-779.

Yin, R. K. 2014. *Case study research: Design and method.* 5th ed. Thousand Oaks. CA: Sage.

Yu, Y., Cheng, G. and Qiang, X. 2016. Data centre transformation: Integrated business model framework of cloud computing oriented data centre. In *2016 IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference (IMCEC),* Xian, China, October 3-5, 2016. (pp. 1848-1855). IEEE.

Zalewska-Kurek, K., Kandemir, S., Englis, B.G. and Englis, P.D., 2016. Development of market-driven business models in the IT industry. How firms experiment with their business models? *Journal of Business Models*, *4*(3): 48-67.

Zawawi, N.H.M., 2018. Actor-Network Theory and Inter-Organisational Management Control. *International Journal of Business & Society*, *19(2): 214-234.*

Zel, U., 2016. Leadership in Change Management. In *Organizational Change Management Strategies in Modern Business* (pp. 272-288). IGI Global.

Zhang, M. 2015. Evaluation of information systems. *Wiley Encyclopedia of Management*, pp.1-3.

Zheng, C., Yu, X. and Jin, Q. 2017. How user relationships affect user perceived value propositions of enterprises on social commerce platforms. *Information Systems Frontiers*, *19*(6): 1261-1271.

Appendices

Appendix A: Interview Questions (Guidelines)

A. IT personnel

1.1 Can you please explain how the organisation selects IS/IT solutions for its processes and activities?

1.1.1 Please give me examples of the IS/IT solutions that have been selected in the last 3 or 5 years?

1.2 Can you please explain the procedures or processes involved in selecting IS/IT solutions used by the organisation for its activities?

1.2.1 What is your view about the procedures or processes?

1.3 In your view, what are some of the challenges encountered in the process of selecting the IS/IT solutions

1.3.1 How were the challenges resolved?

1.4 How often does the organisation review or evaluate its' IS/IT solutions used?

1.5 Why do you think the organisation carries out the review or evaluation?

1.6 Can you please explain the process of evaluation?

1.7 Can you explain the challenges encountered in the process of evaluation of the IS/IT solutions?

1.8 What do you think of the process and why?

1.9 How (I mean the process) are the solutions implemented in the organisation?

1.10 Please give me some examples of the IS/IT solutions that have been implemented in the last 3 or 5 years.

1.11 What are some of the challenges that were encountered in each of the implementation?

1.12 How were some of the challenges resolved?

1.13 What do you think about the process of implementation in the organisation?

1.14 What do you think are some of the factors that influence the implementation of the IS/IT solutions in the organisation?

1.15 In your view, why do you think the factors exist?

B. Business personnel

1.1 What are some of the IT systems that you use in carrying out your work?

1.2 In your view how does the systems often come about?

1.3 What are some of the benefits of using some of the systems?

1.4 What are some of the challenges when using the systems?

1.5 Why do you think the challenges exist?

1.6 Can you please explain how some of these challenges have been resolved in the past?

1.7 What do you think of the challenges?

1.8 What do some of your colleagues think about the challenges?

1.9 Do you sometimes give input when the organisation is looking for a system?

1.9.1 If yes, why? If no, why not?

1.10 Do some of your colleagues sometimes give input when the organisation is looking for a system?

1.10.1 If yes, why? If no, why not?

1.11 Does the IT have a process through which they introduce the systems to you as business people?

1.11.1 If no, why is that? If no, what do you think of the process?

1.12 What do your colleagues think about the process?

Appendix B: Ethical Consideration Letter

Cape Peninsula University of Technology

P.O. Box 652 • Cape Town 8000 South Africa •Tel: +27 21 469 1012 • Fax +27 21 469 1002
80 Roeland Street, Vredehoek, Cape Town 8001

Office of the Research Ethics Committee	Faculty of Informatics and Design

28 November 2018

The Faculty Research Ethics Committee hereby grants ethics clearance to Mr Rotimi Adediran Ibitomi, student number 218321414, for research activities related to the PhD in Informatics at the Faculty of Informatics and Design.

Title of thesis:	A framework for evaluating banking information systems in Nigeria

Comments

Research activities are restricted to those details in the research proposal. Data collection permission is required for this study and a letter of formal consent should be submitted to the Faculty Research Ethics Committee.

Signed: Faculty Research Ethics Committee	Date
	28/11/2018

RESEARCH ETHICS COMMITTEE
INFORMATICS AND DESIGN
ETHICS APPROVAL GRANTED
28 NOV 2018
Cape Peninsula University of Technology