Factors Affecting Ecommerce adoption in Nigerian Banks

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Abstract

This study's focuses on "Factors Affecting the Adoption of Electronic Commerce: Evidence from Nigerian Banks". There are three reasons for concentrating on this topic: 1) Limited research on ecommerce in developing countries particularly in Africa, 2) Nigeria with a population of 135 million is a potentially lucrative market for ecommerce services, and 3) The banking sector has been most successful with ecommerce in Nigeria.

Since ecommerce is still a relatively new concept in Nigeria despite, innovation diffusion theory was used as a foundation for the study. Drawing from technological innovation literature, an integrated model of ecommerce adoption in Nigerian banks was developed. Nine variables affecting the adoption of ecommerce were identified. They are: top management support, organizational competency, IT capability, perceived benefits, perceived compatibility, perceived complexity, supporting industries, market, and government e-readiness.

An empirical study of banks that were using ecommerce was conducted in order to answer the research questions. The commercial banks in Nigeria make up the population of this research. Banks that use ecommerce were identified by examining their websites; after which managers and executives were approached and asked to participate in the research. Data was collected by means of survey questionnaires and semi-structured interview.

Nine hypotheses were drawn based on the variables identified. All but one of the hypotheses were confirmed. The rank of the factors affecting adoption of ecommerce (in descending order of impacts) is: Perceived complexity, Perceived benefits, Organizational competence, Perceived compatibility, Supporting industries e-readiness, Management support, Market e-readiness, IT capability, and Government e-readiness.

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1   Introduction

The purpose of this chapter is to introduce the background of this report, explain the research question and clarify the research purpose. A brief overview of electronic commerce activity in Nigeria is also presented in this chapter; while it may have been appropriate to discuss the topic in the frame of reference, it is discussed here to give the reader a better understanding of the research problem.

1.1   Background

Advances in information and communication technologies and the emergence of the internet have revolutionized business activities enabling new ways of conducting business referred to as electronic commerce (Zwass 2003; Turban, King, Lee, & Viehland, 2004). Electronic commerce (ecommerce) describes the process of buying, selling, transferring, or exchanging products, services, and/or information through computer networks, principally the Internet (Turban et al., 2004). Electronic commerce can also be defined as "the sharing of business information, maintaining of business relationships, and conducting of business transactions by means of telecommunications networks" (Zwass, 2003).

Electronic commerce activities include the inter-organizational processes of market-based sell-buy relationships and collaboration (known as business-to-business, or B2B, commerce) and consumer-oriented activities (business-to-consumer, i.e., B2C, and consumer-to-consumer, or C2C), as well as the intra-organizational processes that support them (Zwass, 2003). Electronic commerce as a way of doing business has significant advantages; organizations are embracing e-commerce as a means of expanding markets, improving customer service, reducing costs, and enhancing productivity (Wenninger, 1999). Efficiencies are experienced in marketing and advertising; ecommerce makes disintermediation possible, eliminating the middleman (Turban et al., 2004). Other efficiencies include reduced inventory and round the clock access at no additional cost. Ecommerce enables higher customization (Choi & Whinston, 2000) allowing organizations to improve customer service. A vital benefit of ecommerce is access to global markets which enables businesses to expand their reach. The Internet allows for unconstrained awareness, visibility and opportunity for an organization to promote its products and services (Senn, 2000).

Despite the global reach of e-commerce, not all countries have taken advantage of or benefited from e-commerce. There is a big gap in Internet and ecommerce adoption between the developed and developing countries (Licker & Motts, 2000); thus creating a digital divide. Digital divide is defined as the "differential capabilities of entire social (or regional) groups to access and utilize electronic forms of knowledge" (Straub, 2003), segregating the 'haves' from the 'have-nots' in the information society.

Mbarika, Okoli, Byrd and Datta (2005) state that much of the discussion on digital divide has focused on that which occurs among different social groups; they note the existence of international digital divide between countries. According to them this digital divide is abundantly clear when comparing Sub-Saharan Africa with countries of the west like US or UK. One area where international digital divide is evident is in electronic commerce, one only needs to examine the major ecommerce sites to detect the inequality. The main obstacles that prevent developing countries from leveraging the internet are lack of adequate communication infrastructure, technical know-how, and information processing

about the economy and environment. The lack of adequate banking infrastructure is also considered as one of the problems faced by developing countries in building ecommerce solutions (Khalfan & Akbar, 2006)

1.2   Overview of ecommerce in Nigeria

Internet usage in Nigeria is still relatively low compared to developed countries and ecommerce is still in an elementary stage, notwithstanding there is growing awareness in of the benefits and opportunities offered by ecommerce amongst Nigerians (Bamodu, 2005).

Ecommerce activity in Nigeria is steadily growing as a result of vast improvements in telecommunication services. The Telecommunications Industry has experienced exponential growth in the last four years with about 20 million telephone lines connected to date (Ndukwe, 2006). Alongside this growth, there has been an increase in the number of private telephone operators offering fixed wireless service with data transfer capabilities leading to an increasing number of people with internet access at home in the major cities and in some rural areas. Moreover, with the reduction in tariffs and further cuts expected, telecommunications service will become more affordable and essential to many Nigerians. The recent advances in the telecoms market, and the explosion in the number of subscribers, demonstrate the potential market for information communication technology services generally in Nigeria (Ndukwe, 2006). Given Nigeria's sizable population it is a potentially lucrative market for electronic commerce services.

According to the Economist Intelligence Unit (EIU, 2006), the stock of personal computers (PCs) per 1,000 persons grew from 10.66 in 2004 to 11.09 in 2005. The greatest obstacle to the growth of e-commerce is low PC penetration. However affordable Asian technologies and falling microchip prices have fuelled a market in cloned as well as branded PCs.

Electronic banking is one area of ecommerce that has proven successful in Nigeria (EIU, 2006). Nigerian banks are increasingly seeking to provide general banking facilities online. Internet banking is slowly and steadily gaining ground, banks have set up websites which publish corporate information and allow customers to carry out some form of transaction – limited in most cases. Despite the growing focus on internet banking not all banks are moving at the same pace, some still have only informational websites. Given that the banks exist in the same operational environments, some other factors other than the often cited country context must be responsible for the difference in attitude to electronic commerce among banks.

The initial advances that have been made in electronic banking is a step in the right direction and could be a motivator in the adoption of ecommerce services amongst Nigerians (EIU, 2006).

1.3   Problem Statement

The current study's main area is "Factors Affecting the Adoption of Electronic Commerce: Evidence from Nigerian Banks". There are three reasons for concentrating on this topic: 1) Limited research on ecommerce in developing countries particularly in Africa, 2) Nigeria

with a population of 135 million is a potentially lucrative market for ecommerce services, and 3) The banking sector has been most successful with ecommerce in Nigeria.

Much of the research on Information and Communication Technologies (ICT) and particularly ecommerce has focused on developing countries (Banker & Kauffman, 2004; Grandon & Pearson, 2004; Mbarika, Okoli, Byrd and Datta, 2005). Ecommerce in developing countries especially Africa has not been sufficiently researched (Molla & Licker, 2005), and the available research activity is usually concentrated on South Africa. Considering the limited research in ecommerce activity in developing countries, one might ask whether the results from research conducted in developed countries are applicable to developing ones. Is conducting a separate research on Nigeria necessary?

Information systems implementation depends on specific social, cultural, economic, legal and political context, which may differ significantly between countries (Stiglitz, 1998; Shore, 1998; Spanos et al., 2002). Thus, one can argue that findings from developed countries are not directly transferable to developing countries. Dewan and Kraemer (2000) showed that differences in country-contexts can lead to different ICT use and impact patterns. Support for their results is provided by the findings of Clarke (2001).

Non-transferability of findings from research in developed countries is not the only reason for the necessity of this study, but also because of limited understanding of what drives ecommerce adoption among businesses in developing countries (Molla & Licker, 2005). Thus there is a need for more research to improve understanding of the drivers of ecommerce in developing countries. Gathering empirical evidence from different environments will make it possible to generalize on adoption of ecommerce (Spanos et al., 2002). Therefore the justifications for this study are: 1) limited ecommerce research on developing countries, 2) non-tranferabilty of results from developed countries and 3) limited understanding of drivers of ecommerce adoption in developing countries.

According to Guardia (2001) banks can play a role in ecommerce at two levels. First, they together with payment and communication systems form necessary infrastructure for ecommerce. Secondly banks can deliver services via ecommerce. Electronic banking is one area of ecommerce that has proven successful in Nigeria (Economist Intelligence Unit, 2006). Nigerian banks are increasingly seeking to provide general banking facilities online. Banks have set up websites that carries corporate information and allows customers to carry out some form of transaction – limited in most cases. Studying ecommerce activity in Nigerian banks will provide understanding of the drivers of ecommerce in Nigeria. The research focuses on Nigeria because it is the most populous African country (CIA, 2006) and is a potentially lucrative market for ecommerce services.

1.4   Research Question and Objectives

The research questions of this study relate to the factors that influence the adoption and implementation of ecommerce in developing counties with particular reference to the Nigerian banking industry. The specific questions to be examined are:

1. What factors determine the likelihood of adoption of ecommerce in Nigerian banks?

The main objectives are:

1. To understand the ecommerce adoption behavior of banks and the factors that could drive or inhibit the wide adoption and use of electronic commerce in the Nigerian Banking Industry, and

2. To rank the importance of such factors on the decision to adopt and use ecommerce applications in Nigerian banks.

2 Theoretical Framework

The aims of this chapter is to build the theoretical framework for the empirical study. By exploring research in innovation diffusion and relating it to ecommerce adoption, it guides readers to the formulation of the nine variables used to investigate ecommerce adoption in Nigerian banks. The development of the research model is based on the research question and literature survey. Innovation diffusion theory is used because ecommerce is still a new concept to developing countries like Nigeria despite the fact that ecommerce has been around for some time.

2.1 Background

Electronic commerce can be considered as a package of innovations (Zwass, 2003; Molla, 2006); various authors have applied innovation theory to study adoption of IT innovations (Kamal, 2006; Aguila-Obra & Padilla-Melendez, 2006; Kuan & Chau, 2001).

Innovation diffusion theory will be used as a foundation for this study. Rogers (1983) defined organizational innovation as the development and implementation of ideas, systems, products, or technologies that are new to the organization adopting it. The adoption of innovations is a process that includes the generation, development, and implementation of new ideas or behaviors (Rogers, 1983). The innovation does not necessarily have to be new in terms of discovery or invention; it only has to be perceived as new by the organization (Zaltman, Duncan & Holbek, 1973). Thus, innovation diffusion theory is well suited for researching the adoption of ecommerce in developing countries.

Various studies have classified the factors influencing innovation adoption (Kim and Galliers, 2004). Rogers (1983) grouped the factors under characteristics of innovation. Tornatzky and Fleischer (1990) identified three different categories of factors – organizational, technological, and environmental factors – that influence the technological innovation decision. Kimberly and Evanisko (1981) identified three groups of predictors of innovation: characteristics of organizational leaders, characteristics of organization, and characteristics of environment. In summary, four categories of factors can be found in technological innovation literature: (1) Managerial; (2) Organizational; (3) Technological; and (4) Environmental.

Researchers have identified the following common environmental factors relating to IT adoption (and specifically the adoption of Internet technologies): pressure from competitors, customers or suppliers; the role of government (incentives); partners' alliances; technological infrastructure; technology consultants; image of Internet technology; and users' expectations (Aguila-Obra & Padilla-Melendez, 2006)

Technological factors include complexity, compatibility, relative advantage, ease of use and usefulness (Davis, 1989 & Rogers, 1983). The technological factors are related to barriers to technology adoption and its perceived benefits. The perceived benefits for managers could be direct, such as cost savings or income generation, or indirect, such as potential opportunities in new markets, marketing, or publicity (Poon and Swatman, 1999). Thus, when adopting an innovation, organizations must perceive the positive effects of the adoption – and hence its potential value – before starting the process (Vadapalli and Ramamurthy, 1997).

The organizational factors that have been mostly cited in literature include: IT users' community; organizational structure; firm's processes; firm size; technological capabilities

of the organization's members; the technological and financial resources available; the culture of the organization; process of selecting and implementing the IT; management backing and support for the project; and the project leader (Aguila-Obra & Padilla-Melendez, 2006).

Some researchers have integrated these factors into one model (Kamal, 2006; Kuan & Chau, 2001; Mehrtens, Cragg, & Mills, 2001) allowing for the treatment of all these factors and their interaction in one dynamic framework. Such framework can explain marked differences in the performance of organizations in identical contextual situations (Montealegre, 1996). Kamal (2006) integrated findings from studies that investigated various factors impacting on innovations and proposed a model of IT adoption. The factors were classified into perceived technology factors, organizational factors, external factors, collaboration factors, and support. Kuan and Chau (2001) suggested a model of EDI adoption based on a technology–organization–environment framework. Other studies (Mehrtens, Cragg, & Mills, 2001) have used innovation, organizational, and environmental factors to explain differences in ecommerce adoption. However, most of the studies are based on developed countries.

Molla and Licker (2005) incorporated the concept of eReadiness into the technology-organization-environment framework and proposed a perceived eReadines model (PERM). They defined "perceived eReadiness" as an organization's assessment of the eCommerce, managerial, organizational, and external situations in making decisions about adopting eCommerce.

2.2   Diffusion of Information Technology Innovations

Innovation difussion is a multidisciplinary field with contributions from sociologists, communication researchers, organizational researchers, IT researchers and many others (Kim & Galliers, 2004). The study of innovation diffusion is concerned with three fundamental research questions:

- What determines the pattern, and extent of diffusion of an innovation? (Fichman, 2000)

- What determines the likelihood of an organization to adopt and absorb innovations? (Fichman, 2000)

- What determines the likelihood of an organization to adopt and absorb a particular innovation? (Fichman, 2000)

Rogers (1995) classical model of diffusion greatly shaped the basic concepts, terminology, and scope of the field of innovation diffusion (Fichman, 2000).

Innovation studies conform to one of two general styles of research: adopter studies and diffusion modeling studies (Fichman, 2000). Adopter studies are basically concerned about understanding differences in adopter innovativeness. The usual approach is to survey organizations in some population of interest to capture data about:

- The characteristics of those organizations and their adoption context

- The timing and/or extent of adoption of one or more innovations

Diffusion modeling studies are primarily interested in what determines the rate, pattern and extent of technology diffusion (Kim & Galliers, 2004).

2.3   Factors Affecting Diffusion of IT Innovations

The factors affecting innovation can be classified into three broad groups:

- those belonging to the technologies and their diffusion context

- those belonging to organizations and their adoption contexts

- those belonging to the combination of technology and organization (Fichman, 2000).

The three groups are connected to the three fundamental research questions identified in the previous section. The pattern, and extent of diffusion of an innovation is affected most by technologies and their diffusion context. Organizations and their adoption environments affect what determines the likelihood of organizations to adopt and absorb innovations. Technology and organization determine the likelihood of an organization to adopt and absorb particular innovations (Fichman, 2000).

2.4   Research Model

The research questions is: What factors determine the likelihood of adoption of ecommerce in Nigerian banks? The research question is concerned with whether a bank is using ecommerce or not. Drawing from technological innovation literature, an integrated model of ecommerce adoption in Nigerian banks was developed (see figure 1). Each of the variables is discussed below.

2.4.1   Ecommerce Adoption

The dependent variable is adoption of ecommerce. In this study, adoption of ecommerce is defined as the use of computer networks, principally the internet, for sharing of business information; maintaining of business relationships; and conducting of business transactions (Turban et al., 2004 & Zwass, 2003). The likelihood of ecommerce adoption, was operationalized as a dichotomy: whether the business has or has not adopted ecommerce. A business is defined as having adopted ecommerce if it is achieved interactive ecommerce status. Molla and Licker (2005) identified a six-phase ecommerce status indicator, relevant to ecommerce in developing countries; they are: no ecommerce, connected ecommerce, static ecommerce, interactive ecommerce, transactive ecommerce, and integrated ecommerce.

2.4.2   Top Management Support

According to Tolbert and Zukar (1983) innovation of IT would be more likely if the political environment within an organization has norms favoring the change. Thus, adopting ecommerce will depend on whether support from top management is available. Top management support has been identified as crucial in the acquisition and diffusion of innovation (Orlikowski, 1993). Top management consists of individuals with power and authority to make strategic decisions; thus they can develop a clear-cut ecommerce vision and strategy while at the same time sending signals to different parts of the organization about the importance of ecommerce. Given the limited nature of organizational resources and the many competing projects, top management support ensures that an ecommerce innovation project will get the required resources and capabilities. There is a positive effect of leadership support on innovation adoption; Rai and Patnayakuni (1996) found that top management support had a positive effect on CASE tools adoption behavior in IS departments.

Ecommerce can potentially influence the organization's competitive position as well as its business relationships, therefore it is important that top management need to get involved in order to gain a good understanding of the issues surrounding ecommerce and mobilize organizational stakeholders (Epstein, 2004). Thus, we propose that (H1 indicates hypothesis number 1):

H1   *Top management support and commitment will be positively related to   ecommerce adoption.*

2.4.3   Organizational Competency

The availability of employees with competency for producing new ideas is important for ecommerce adoption (Mohr, 1969). Organizational competency refers to the availability of employees with adequate experience and exposure to information and communication technology and other skills (such as business strategy) that are needed to adequately staff ecommerce projects (Molla & Licker, 2005)

Chwelos et al (2001) stated that the level of management understanding of and support for using IT to achieve organizational objectives may influence the adoption of IT innovation. Thus, an understanding of ecommerce technologies and business models can facilitate the adoption of ecommerce.

Thus, we propose that:

H2   *A high level of competency from within the organization can have a positive impact on ecommerce adoption.*

2.4.4   IT Capability

IT capability refers to the level of IT resources and personnel IT knowledge of an organization (Akbulut, 2002). Access to adequate equipment in the organization is a major determinant of the adoption of new technologies (Newcomer and Caudle, 1991).

Cohen & Levinthal (1990) state that an organization's ability to appreciate an innovation, to assimilate it, and apply it to new ways is largely a result of the firms preexisting knowledge in areas relating to the intended innovation.

Adoption of ecommerce requires organizations to possess a set of IT-related skills and knowledge (Turban et al., 2004) such as telecommunication knowledge, IT security knowledge, and Internet application environment.

Thus, we propose that:

H3   *A high level of IT resources can positively impact ecommerce adoption*

2.4.5   Innovation Characteristics

The likelihood and the rate of adoption of a given innovation depend on its characteristics as perceive by potential adopters. These characteristics include relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995).

2.4.5.1   Perceived Benefits

Perceived benefits refer to the extent of managements recognition of the relative advantage of adopting ecommerce to the organization. Perceived benefits is an important factor in adoption of new innovations (Iacovou et al., 1995; Rogers, 1995). Rogers (1995) defined ***Relative advantage*** as the extent to which an innovation is perceived as better than the idea it supersedes or its nearest alternative. Relative advantage can be measured in financial terms; however, social status, comfort, and satisfaction are important factors as well. The amount of objective advantage of an innovation have a great effect, what affects adoption of an innovation is whether the innovation is viewed as advantageous. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be (Rogers, 1995). This view is supported by Iacovou et al. (1995); they found that perceived benefits have a positive effect on the likelihood of EDI adoption.

The higher the appreciation of the benefits of ecommerce by management the more likely they are to set aside organizational resources necessary to adopt and implement ecommerce.

Thus, we propose that:

H4   *A high level of perceived benefits will positively impact adoption of ecommerce.*

2.4.5.2   Perceived Compatibility

Perceived compatibility refers to the degree to which an innovation is perceived as being consistent with existing needs, values, past experiences, and technological infrastructure of potential adopters (Rogers, 1995 & Rogers 1983). An innovation might be perceived as technically or financially superior in accomplishing a given task, but it may not be adopted, if a potential adopter views it as irrelevant to its needs (Rogers, 1995). If ecommerce is seen

as compatible with the existing work practices, environments, and overall objective, organizations will be more likely to adopt it.

Thus, we propose that:

H5   *A high level of perceived compatibility will positively impact the adoption of ecommerce*

2.4.5.3   Perceived Complexity

Perceived complexity refers to the degree to which an innovation is perceived as difficult to understand and use. New ideas that are simpler to understand are adopted faster than those requiring the adopter to develop new skills and understanding (Rogers, 1995). Akbulut (2002) state that the complexity of a technology has a major effect on the adoption decision, while Chwelos et al. (2002) state that complexity is a strong inhibitor of intent to adopt innovation.

Thus, we propose that:

H6   *A high level of perceived complexity will negatively impact adoption of ecommerce*

2.4.6   Market e-readiness

Market e-readiness refers to "the assessment that an organization's business partners such as customers and suppliers allow an electronic conduct of business" (Molla & Licker, 2005). For ecommerce to thrive sellers and buyers have to be willing to exchange goods and services for money online (Turban, 2004). Thus, an organization considering adoption may first examine the willingness of its existing customers and suppliers to do business online or the likelihood of generating new business online.

Thus, we propose that:

H7   *A high level of market e-readiness will positively impact adoption of ecommerce*

2.4.7   Supporting Industries e-readiness

Supporting Industries e-readiness refers to "the assessment of presence, development, service level and cost structure of support-giving institutions such as telecommunications, financial, trust enablers and the IT industry, whose activities might affect the ecommerce initiative of businesses in developing countries" (Molla & Licker, 2005). Existence of adequate IT infrastructure is a necessary condition for the take-off of and development of ecommerce (Palacios, 2003); since organizations would rather concentrate on their core competencies, it is vital that there are other organizations whose main activity is provision of IT infrastructure and services.

Thus, we propose that:

H8   *The existence of supporting services for ecommerce would positively impact adoption of ecommerce*

2.4.8   Government e-readiness

Government e-readiness refers to "the organizations' assessment of the preparation of the nation state and its contributions to promote, support, facilitate and regulate ecommerce

and its various requirements" (Molla & Licker, 2005). The government has a strong role in promoting and spreading the benefits of electronic commerce (Bandyo-padhay, 2002). The result of the research carried out in Slovenia showed that government's activities played an important role in accelerating electronic commerce (Pucihar, 2006).

Governments can provide an enabling environment in which ecommerce can realize its full potential. They can help address the problems & challenges of awareness, infrastructure develop, local content creation depending on languages used & cultures prevailing in the local environment (Kamel, 2006).

Thus, we propose that:

H9   *The absence of strong support for ecommerce activities fron government would negatively impact adoption of ecommerce*
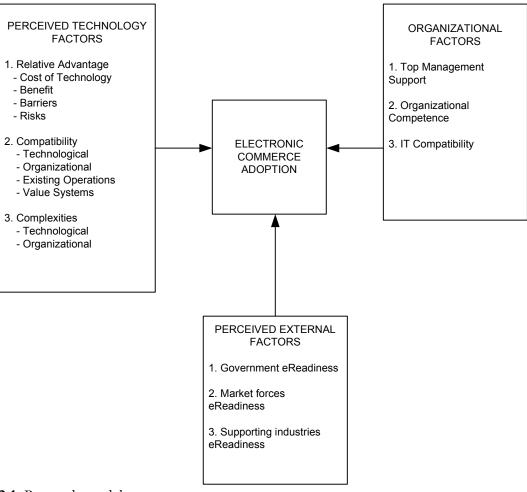

Figure 2.1 Research model

3   Methodology

In order to answer the research questions, we conducted an empirical study of banks that were using ecommerce. The research purpose and question of this thesis can be described as both exploratory and confirmatory but largely confirmatory. The research is designed around the positivistic paradigm with a triangulation approach – the combination of methodologies in the study of the same phenomenon – in the process of collecting and analyzing data. In the following sections we discuss why these techniques were used.

3.1   Research Method

The purpose of the authors helps determine how the research strategy is formulated, the research purpose also helps readers to understand the direction of the research. Thus, the way the study goes depends on how the purpose is structured (Eriksson & Wiedersheim, 1997). Research in social and behavioral sciences can be subdivide into exploratory and confimatory methods (Onwuegbuzie and Tedlie, 2003). Exploratory research is conducted when a problem has not been clearly defined, or its real scope is not yet clear. It allows for familiarization with the problem or concept to be studied. Exploratory research helps determine the best research design, data collection, and selection method. An explorative investigation is appropriate when a research problem is unstructured and difficult to delimit (Eriksson & Wiedersheim, 1997).

Confirmatory research is conducted where there is a clear understanding of a problem. That is, there is a theory (or several theories), and the objective of the research is to find out if the theory is supported by the facts. Thus, hypothesis are explicitly stated and tested in confirmatory research. In summary, the objective of exploratory is theory initiation and theory building while confirmatory research focuses on theory testing. However research can be classified on a continuum between exploratory and confirmatory research.

The research purpose and question of this thesis can be described as both exploratory and confirmatory but largely confirmatory, since we aim to find out factors determine the likelihood of adoption of ecommerce in Nigerian banks while using existing theory.

3.2   Research Approach

Beyond the exploratory/confirmatory classification research can be classified as quantitative or qualitative. Quantitative research methods were originally developed in the natural sciences to study natural phenomena (Oliver, 2004). It is a formal, objective, systematic process in which numerical data is used to obtain information about the world. In quantitative research the aim is to determine the relationship between one thing (an independent variable) and another (a dependent or outcome variable) in a population.

Qualitative research involves the use of qualitative data such as interviews, documents, and participant observation data, to understand and explain social phenomena (Oliver, 2004). Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live.

Although research can be either quantitative or qualitative, some researchers have suggested combining one or more research methods in the one study (called triangulation).

The research objective in quantitive studies can fall between a continuum from exploratory to confirmatory (Onwuegbuzie & Leech, 2005). A quantitative research objective is exploratory if the goal of the study is to examine the patterns from data collected by the researcher. On the other hand, a quantitative research objective is confirmatory if the research involves the use underlying data collected to test hypotheses. With qualitative research, use of exploratory research is dominant; nothwithstanding qualitative research objectives can be confirmatory.

The research approach chosen (quantitative or qualitative) depends on the problem definition and the kind of information needed. Both approaches can be combined where suitable (Holme & Solvang, 1991). Quantitative and qualitative approach both share the goal of creating a better understanding of society through comprehending how individuals, groups and institutions act and influence each other.

Quantitative research are more structured and formalized, it is also characterized as involving the study of a few variables on a large number of entities (Holme & Solvang, 1991). Quantitative approach is useful when conducting research involving many units. For these reasons the approach chosen for this thesis is largely quantitative. The authors believe that the quantitative approach meets the requirements for the stated objectives of this research.

3.3 Positivistic paradigm

Positivism is used as it proposes an objective view of social reality; the epistemological assumption is based on phenomena that are observable and measurable (May, 1998). The theory, hypothesis and model in the study were derived from literature. The conceptual model was developed to further understanding of "the factors that determine the likelihood of ecommerce adoption in Nigerian banks". The relationship between variables will be established in an attempt to predict the drivers of ecommerce in Nigerian banks. For instance, it is hypothesized that perceived benefits is one of the factors that influence ecommerce adoption. This hypothesis is supported by the Diffusion of Innovations Model (DOI) (Rogers, 1995). DOI consider the complexity, compatibility, relative advantage, ease of use, usefulness as key drivers of adoption. Therefore, we argue that the problem in this study is observable and measurable.

3.4 Triangulation approach

Data was collected and analyzed by means of survey questionnaires, semi-structured interview and document examination (triangulation approach). Triangulation was chosen because it offers the use of different research techniques giving many advantages. Denzin (1970), for example, suggested that the use of triangulation approach offers greater validity and reliability than a single methodological approach. Dixon et al. (1988) state that most hypotheses and research objectives can be researched using more than one technique of data collection; providing detailed data about the phenomenon being investigated. Also,

different collection methods help to generate multiple and different perceptions of the problem under investigation. This gives a wider view of the research problem.

3.5   Data collection and procedures

Banks that use ecommerce were identified by examining their websites; after which managers and executives were approached and asked to participate in the research. Data was collected by means of survey questionnaires and semi-structured interview.

3.5.1   Questionnaire preparation

The questionnaire was prepared in two stages. First, an initial pool of eighty items was generated. Following the method of Molla & Licker (2005), the items were reviewed and edited to capture the essence of the concepts and constructs and a preliminary questionnaire containing 53 items resulted. A group of ecommerce consultants, within the Nigerian banking sector, were contacted to review the items in the preliminary questionnaire. The consultants were selected based on their experience and knowledge of ecommerce issues within the Nigerian banking sector. They were asked to judge the degree of relevance of each of the items in the instrument as measures of individual variables. Based on interviews with the consultants the pre-test questionnaire was prepared

3.5.2   Survey questionnaires

Questionnaires are appropriate for gathering the views of a large number of people about a particular phenomenon (Stroh, 2000). Questionnaires were used to gain general picture of factors affecting the adoption of ecommerce. Eighty questionnaires were administered.

 Respondents were recommended by the participating banks. Questionnaires were sent out by email. The participating banks were asked to nominate a contact person to assist the researchers during the administration of the survey questionnaires.

The questionnaires consist of questions that are related to possible factors affecting adoption ecommerce as identified in literature. Likert five point scales ranging from 'strongly agree' to 'strongly disagree' are used as a basis of questions. This scale has been used in previous ecommerce adoption research (Molla & Licker, 2005).

Instruments from previous research in ecommerce and IT in developing countries were adapted for this survey. The questions were categorized according to the factors discussed in the research model. Top management support was measured by a four-item scale assessing top management interest & support for ecommerce (Molla & Licker, 2005). Perceibed benefit is assessed on a five-item scale based on the survey questionnaire of Thong (1999) who investigated IS adoption in small businesses. The questions measured an understanding of the benefits and application of ecommerce by managers.

Perceived complexity is assessed on a four-itwm scale measuring the perception of users concerning the ease with which ecommerce can be applied to the business.

3.5.3   Pre-Test and Pilot Test

Compeau and Higgins (1995) recommend that validation of the questionnaire should be carried out to guarantee its efficacy . The questionnaires were administered to 20 randomly selected respondents, respondents were encouraged to come up with factors they viewed as significant in their adoption of ecommerce in order to appraise the validity of the questionnaire (this method was used by Molla & Licker, 2005). Based on their response the final questionnaire was prepared and administered.

3.5.4   Semi-structured interview

The semi-structured telephone interview is designed to qualitatively analyze respondents' views on ecommerce adoption. It is used to verify and understand the data collected from the survey. In this research, a total of 10 top managers were interviewed independently. People, within the banking industry, who had previous experience with ecommerce were chosen for the semi-structured interview. Interview time varied in length from 15 to 30 minutes. The interview was recorded by note taking. The interview was made up of questions relating to economic and business factors affecting the adoption of ecommerce within the Nigerian banking sector.

3.5.5   Document analysis

Information about ecommerce was gathered from documents such as banks' annual report, journals, and industry magazines. This provided better understanding of the research problem and findings. Books about banking industry and were searched, we were able to get a broader view and a deeper understanding of the industry this way. Also, web pages of banks were accessed from Internet in order to get latest information about the banks' activities, services offered and future services being planned.

3.6   Population

The commercial banks in Nigeria make up the population of this research. There are twenty-five commercial banks, out of which four banks are foreign owned. The twenty-one indigenous banks are the target population for this study. The list of the banks is shown in Table 3.1.

Name	Website	Description
Access Bank Plc	www.accessbankplc.com	Adopter
Afribank	www.afribank.com	Non-adopter
Diamond Bank	www.diamondbank.com	Adopter
GT Bank	www.gtbplc.com	Adopter
Ecobank	www.ecobank.com	Foreign
Equitorial Trust Bank	www.equitorialtrustbank.com	Adopter
FCMB	www.fcmb-ltd.com	Non-adopter
IBTC	www.ibtc.com	Adopter
First Bank	www.firstbanknigeria.com	Adopter
Intercontinental Bank	www.intercontinentalbankplc.com	Adopter
UBA	www.ubagroup.com	Adopter
Zenith Bank	www.zenithbank.com	Adopter
Citibank	www.citigroup.com	Foreign
Fidelity Bank	www.fidelitybankplc.com	Non-adopter
Oceanic Bank	www.oceanicbanknigeria.com	Adopter
First Inland	www.firstinlandbankplc.net	Non-adopter
Platinum Habib bank	www.bankphb.com	Non-adopter
Skye Bank	www.skyebankng.com	Non-adopter
Stanbic	www.stanbic.com.ng	Foreign
Standard Chartered	www.standardchartered.com	Foreign
Union Bank	www.unionbankng.com	Non-adopter
Unity Bank Nigeria		
Wema Bank	www.wemabank.com	Non-adopter
Spring Bank	www.springbankplc.com	Non-adopter
Sterling Bank	www.sterlingbankng.com	Foreign

Table 3.1 Nigerian commercial banks

3.7   Sample Population

A total of eight banks were randomly chosen for this research. Four banks were in the adopter category as well as the non-adopter category. Access Bank, Diamond Bank, GT Bank, and UBA made up the adopter category while the non-adopter category was made up of Afribank, FCMB, Fidelity, and First Inland Bank. The banks were contacted and agreed to participate in the survey. Ten questionnaires were sent to each bank making a total of eighty questionnaires.

Respondents were classified into two groups according to the existence of ecommerce activity within the banks. The banks were classified as adopters or non-adopters using the model of Chung and Payter (2002) who evaluated websites of New Zealand banks. According to them the websites can be used to study the effectiveness, functionalities and Internet strategies of these banks. The classification instrument is shown in table 3.2. The evaluator recorded the absence or presence of each element.

Components	Elements
Information	Company Information
	Customer Infromation
	Product Information
Legal Statement	Legal disclaimer/ Terms and Conditions
	Privacy policy
	Security policy
Order	Check account balance
	Transfer funds between accounts
	Check bank statement
	Purchase bank product (e.g. open an account)
	Download account information
	Make payment
	Order cheque or deposit
	Cheque reconciliation
	Change password
	After sales services (e.g. email enquiries)
Ease of use	Frequently Asked Questions (FAQ)
	Tutorial/Demonstration
	Search function
	Help function

Table 3.2 Evaluation of website

The classification into the adopter/ non-adopter group was largely dependent on the presence of elements under the order component in the table 3.2.

The presence and absence of each element was checked against the information published on the bank websites, especially on the site maps that list what is available. The "demo" at the website were useful for evaluating the presence or absence of specific elements. Contact was made with the customer service departments of the banks before final classification.

3.8 Data Codification

Data collected during the research was documented in a codebook (see appendix 1). The codebook is defined as a research documentation including the description of all variables. All relevant information on each variable in this research was represented in a standard format in the codebook. The following items were included in the codebook:

- Variable name – the variable name was an abbreviation related to the factor been studied together with a number identifying a specific question within the factor (e.g., MK1 for the first question in Market e-readiness)

- Variable labels – used to record more explicit information on the variable content

- Question wording – full question wording used in the survey

Questionnaires with missing values were discarded. New variables were derived by computing the means of responses for all the items within each factor. For example, the variable MK was obtained as follows:

$$MK = (MK1 + MK2)/2$$

The derived variables and corresponding data are shown in appendix 2.

3.9 Data Analysis

Discriminant function analysis and Independent samples t test were used to analyze data in this research. A significant difference was assumed to exist between adopters and non-adopters if the significance level is less than .05. The software package used was SPSS software for Windows version 13.

3.9.1 Discriminant Function Analysis

Discriminant function analysis was used to analyze the codified data from the research survey. Discriminant analysis is the appropriate technique when the single dependent variable is dichotomous (e.g., adopter/non-adopter) and therefore nonmetric (Hair et al., 2004). The independent variables are assumed to be metric in discriminant analysis; this assumption is satisfied in this research. Discriminant analysis is applicable in situations where the total sample can be divided into groups based on nonmetric dependent variable characterizing several known classes (Hair et al., 2004).

The objectives of discriminant analysis are to understand group differences and to predict the likelihood that an entity will belong to a particular group based on several metric independent variables. For example, discriminant analysis is used to distinguish adopters and non-adopters of ecommerce based on their perception of the complexity involved in using ecommerce.

Discriminant analysis involves deriving a variate, in the case of this research the variate is a linear combination of nine independent variables that was used to discriminate between adopters and non-adopters of ecommerce. Discrimination is achieved by setting the variate's weight for each variable to maximize the between-group variance relative to the within group variance (Hair et al., 2004). The linear combination for a discriminant analysis

(discriminant function) in the two-group case is derived from an equation that takes the folllowing form:

$$Z = A + W_1X_1 + W_2X_2 + \ldots\ldots + W_nX_n$$

Where

Z = discriminant Z score of the discrimant function

A = intercept

W_i = discriminant weight for independent variable i

X_i = independent variable i (Hair et al., 2004)

Statistical significance test of the discriminant function is a generalized measure of the distance between the adopters and non-adopters groups centroid (group mean).

The main assumptions in deriving the discriminant function are multivariate normality of the independent variables and unknown (but equal) dispersion and covariance structures (matrices) for the groups as defined by the dependent variable (Hair et al., 2004).

3.9.2   Independent Sample T-Test

The independent sample t test is suitable when examining the nature of two variables at a time with an eye towards answering the basic question: Are these two variables related? (Lowry, 2006). The t test is appropriate for analyzing data in this research as we seek to understand how the various various variables affect adoption of ecommerce.

The t test compares the mean scores of two groups on a given variable (Landau & Everitt). The t test assesses the statistical significance of the difference between two independent sample means

The t test is used to test the null hypothesis that the means of two populations are the same. An alternate hypothesis is that the means of the two groups are significantly different. The assumptions of the t test are: (1) the dependent variable is normally distributed, (2) the two groups have approximately equal variance on the dependent variable, and (3) the two groups are independent of one another. Normal distribution was checked using a Q-Q plot while equal variance was checked by observing the results on the Levene's test. The two groups (adopters/non-adopters) of this research are independent in the sense that they are separate samples containing different sets of individual subjects.

4   Results

In this chapter the data from the survey is analyzed on the basis of the research model. SPSS software for Windows was used to carry out discriminant function analysis and independent samples t test. A significance level of .05 was used.

4.1   Statistical Analysis

Statistical analysis was conducted in two steps. Firstly, a preliminary discriminant analysis was carried out to discover which factors differentiated adopters of ecommerce from non-adopters. The factors were later ranked according to their importance. Secondly, further insights into discriminating factors in the adoption of ecommerce were obtained using t-tests. The t-tests identified items that differentiated between adopters and non-adopters within each factor.

A total of forty nine responses were received; however one of them was unusable. This represented 61% of the total questionnaires sent out.

4.2   Preliminary Discriminant Function Analysis

Using discriminant analysis, major differences were discovered between adopters and non-adopters of ecommerce at the factor level. Discriminant function analysis works with data that is already classified into groups to derive rules for classifying new (and as yet unclassified) individuals on the basis of their observed variable values (Landau & Everitt, 2004). Fisher's linear discriminant function was used as it is suitable for two group situations (Landau & Everitt, 2004). During the analysis all items measuring the different factors were included. The dependent variable, adoption of ecommerce is a dichotomous variables measured by adopters and non-adopters. A set of nine independent factors, based on previous research in technology adoption was used in the survey.

Table 4.1 shows the group means, standard deviations, and the test for equality of the group means of all the factors.

Management support, IT capability, perceived benefit, perceived compatibility, perceived complexity, organizational competence, market, and supporting industries showed significant univariate differences between the two groups (p<.0005). Furthermore, the mean from the adopter group was larger than the mean from the non-adopter group for the eight significant variables. The standard deviation for non-adopters was larger than the adopters in all cases except for management support indicating greater dispersion among non-adopters compared to adopters of ecommerce.

Group Means for the Independent Variables									
	MS	IT	PB	PC	PX	OC	MK	SI	GV
1: Adopters	3.7963	3.7593	3.9037	3.7852	4.1296	3.7901	3.4444	3.2716	2.0815
0: Non-adopters	1.7619	2.6071	2.7714	2.8857	2.0119	2.1587	2.0238	1.8889	2.019
Standard Deviations for the Independent Variables									
	MS	IT	PB	PC	PX	OC	MK	SI	GV
1: Adopters	0.68654	0.33599	0.21028	0.24132	0.16068	0.29451	0.54302	0.41383	0.29488
0: Non-adopters	0.60455	0.47151	0.29179	0.27255	0.29022	0.54384	0.40237	0.38490	0.30922
Test for the Equality of the Group Means									
	MS	IT	PB	PC	PX	OC	MK	SI	GV
Univariate F ratio	0.22	4.253	1.305	2.81	5.899	8.044	1.021	0.109	0.42
Significance level	.000	.000	.000	.000	.000	.000	.000	.000	.480

Table 4.1 Group statistics

All of the independent factors were considered simultaneously in the discriminant analysis regardless of the discriminating power. The discriminant function was significant at .0005 level. The canonical correlation value is 0.987 so that 0.987 x 0.987 x 100 = 97.42% of the variance in the discriminant function scores can be explained by group difference. Thus, a linear combination of the nine independent variables explains 97 percent of the variance in the dependent factors. The lambda coefficient is defined as the proportion of the total variance in the discriminant scores not explained by the difference among the groups, here 2.7%. The rank of importance in descending order, given by the absolute value of loading (Table 4.2), was: perceived complexity, perceived benefit, organizational competence, perceived compatibility, supporting industries, management support, market, IT capability, and government.

Based on the predicted group membership, the classification matrix correctly classified all adopters and non-adopters. Thus the discriminant function was able to classify 100 percent (hit ratio) of the cases correctly assuming homogeneity of the covariance matrices. The hit ratio exceeds the proportional chance criterion of 71 percent demonstrating predictive accuracy of the discriminant function (Hair, Anderson, Tatham & Black, 1998).

Factor	Function
Perceived complexity	.786
Perceived benefits	.382
Organizational competence	.325
Perceived compatibility	.296
Supporting industries e-readines	.289
Top management support	.262
Market e-readiness	.245
IT capability	.242
Government e-readiness	.017

Table 4.2 Structure Matrix

4.3   T-test of Mean Differences

The preliminary discriminant analysis shed some light on the factors that differentiate adopters from non-adopters of ecommerce amongst Nigerian banks. Subsequent analysis employed Independent-Samples T Test to identify which specific items within each factor made the difference. The t-test helped in understanding the specific issues that influenced the adoption of ecommerce. Furthermore, carrying out the analysis at the item level clarified the results from the discriminant analysis.

Table 4.3 shows the results of the Independent Samples T Test across adopters and non-adopters of ecommerce.

Item	Description	t	df	Sig. (2-tailed)	Mean Difference
Top Management Support (MS)					
MS1	Management is interested in the use of electronic commerce	6.482	46	.000	1.741
MS2	Management is supportive of the use of electronic commerce in business operations	10.230	46	.000	2.053
MS3	Our business has a clear vision on electronic commerce	7.833	46	.000	1.847
MS4	Our vision of electronic commerce activities is widely communicated and understood throughout the organization	11.644	46	.000	2.497
IT Capability (IT)					
IT1	Our organization is well computerized with LAN and WAN	5.392	46	.000	.952
IT2	We have high bandwidth connectivity to the Internet	6.395	46	.000	1.323
IT3	We have an established enterprise-wide IT infrastructure	3.187	46	.003	.492
IT4	We have sufficient experience with network based applications	8.471	46	.000	1.841
Perceived Benefits (PB): Electronic commerce should help…					
PB1	Reduce cost of business operations	8.471	46	.000	1.386
PB2	Improve customer service	6.292	46	.000	1.053

PB3	Improve distribution channels	9.833	46	.000	1.513
PB4	Reap operational benefits	9.777	46	.000	1.265
PB5	Increase ability to compete	2.279	46	.027	.444
Perceived Compatibility (PC): Electronic commerce fits well our					
PC1	Organizational beliefs and practices	6.015	46	.000	.915
PC2	Existing technology infrastructure	8.087	46	.000	1.444
PC3	Communication is very open in our organization	1.954	46	.057	.275
PC4	Our organization has a strong relationship with suppliers and customers	.496	46	.622	.079
PC5	Our organization has a positive attitude towards electronic commerce	9.197	46	.000	1.783
Perceived Complexity (PX): inverted					
PX1	Learning to operate electronic commerce is/would be easy	12.854	46	.000	2.122
PX2	Interacting with electronic commerce is/would be flexible	14.048	46	.000	2.079
PX3	My interaction with electronic commerce is/would be clear and understandable	15.421	46	.000	2.381
PX4	It would be easy for me to become skillful at using electronic commerce	13.079	46	.000	1.889
Organizational Competence (OC)					
OC1	Our organization has a good understanding of electronic commerce business models that are applicable to our business	8.242	46	.000	1.577
OC2	We have a good understanding of electronic commerce application solutions that are applicable to our business	10.205	46	.000	1.730
OC3	Our organization has the necessary technical, managerial and other skills to implement electronic commerce	9.923	46	.000	1.587
Market (MK)					
MK1	We believe our customers are ready to do business on the Internet	6.416	46	.000	1.249
MK2	We believe our business partners are ready to conduct business on the Internet	8.627	46	.000	1.593

Supporting Industries (SI)					
SI1	The telecommunication infrastructure is reliable and efficient	7.245	46	.000	1.354
SI2	The technology infrastructure of commercial and financial institutions is capable of supporting electronic commerce transactions	6.050	46	.000	1.095
SI3	We feel that there is efficient and affordable support from the local IT industry to support our move to the Internet	12.498	44.087	.000	1.698
Government (GV)					
GV1	We believe there are effective laws to protect consumer privacy	-.135	46	.893	-.026
GV2	We believe that there are effective laws to combat cyber crime	-.526	46	.601	-.090
GV3	We believe the legal environment is conducive to conduct business on the Internet	-2.412	46	.020	-.413
GV4	We believe that the government demonstrates strong commitment to promote electronic commerce	3.738	46	.001	.857
GV5	Government regulations allow electronic settlement of electronic commerce transactions	-.091	46	.928	-.016

Table 4.3 T test for means

5   Analysis

This chapter discusses the results from the statistical analysis. The results from the statistical analysis are are analyzed based of the research model. All but one of the hypothesis were confirmed; the result from the research was not strong enough to confirm the hypothesis on the impact of strong government support on ecommerce. At the end of the chapter the factors that affect ecommerce in Nigerian banks are are ranked based on the structure matrix.

5.1   Top Management Support

Management support discriminates between adopters and non-adopters of ecommerce. It seems that adopters of ecommerce had greater support from management. All the items within this variable were significant discriminators. The mean value for adopters was significantly larger than the mean value for non-adopters. This is consistent with Orlikowski, (1993) assertion that top management support is crucial in the acquisition and diffusion of innovation.

Therefore, we conclude that top management support positively impacts ecommerce adoption. Thus hypothesis 1 is confirmed.

5.2   IT Capability

The results of the discriminant analysis indicate that IT capability is a significant factor that differentiates adopters from non-adopters. However, it is the least important factor among the significant factors. This somewhat supports Iacovou et al. (1995) findings that low level of IT sophistication was one of the factors that caused organizations to resist EDI adoption.

The result is expected if one considers that ecommerce adoption involves the use of a set of IT-related skills and knowledge (Turban et al., 2004) such as telecommunication knowledge, IT security knowledge, and Internet application environment. Thus we conclude that a high level of It resources and personnel IT knowledge will positively impact ecommerce adoption. Therefore hypothesis number 3 is confirmed.

5.3   Perceived Benefit

Perceived benefits ranked second on the structure matrix and is a significant factor that differentiates between adopters and non-adopters of ecommerce. The adopter group seems to believe that ecommerce helps reduce cost of business operations, improve customer service, improve distribution channels, and increase ability to compete. This supports Craig & King (1993) claim that relative advantage is one of the consistent critical innovation adoption factor. Thus we conclude that a high level of perceived benefit will positively impact ecommerce. Therefore hypothesis number 4 is confirmed.

5.4   Perceived Compatibility

Perceived compatibility of the organization with ecommerce was a discriminating factor between adopters and non-adopters of ecommerce in the Nigerian banking sector. This result is supported the findings of earlier research (Betty, Shim & Jones, 2001). Tornatzky and Klein (1982) also reported a significant positive relationship between compatibility and adoption of innovation.

Ecommerce represents a major change from previous ways of doing business. Thus a bank adopting ecommerce may have to reorganize and rethink how it conducts transactions with customers. This need for change can explain the impact of perceived compatibility on adoption of ecommerce if high level of compatibility is seen as meaning that less change is required within the adopting organizations. Evidence from this research suggest that banks whose existing infrastructure and organizational climate are compatible with ecommerce are more likely to adopt eccommerce.

5.5   Perceived Complexity

Perceived complexity emerged as the best discriminator between adopters and non-adopters of ecommerce. The results suggest that adopters possess the financial and technological resources to implement ecommerce. Non-adopters seem to lack these resources. This result supports the assertion of Rogers (1995) that innovations that are simpler to understand and use are adopted faster than those requiring the adopter to develop new skills and understanding.

Adopters of ecommerce seem to believe that using or learning to use ecommerce is easy while non-adopters have a contrary view. Thus we conclude that a high level of perceived complexity negatively impacts ecommerce adoption. Therefore hypothesis number 6 is confirmed.

5.6   Organizational Competence

Organizational competence emerged as the third best discriminating factor between adopters and non-adopters of ecommerce. Thus the availability of employees with adequate understanding of ecommerce technologies will facilitate the adoption of ecommerce. Lacovo et al. (1995) found out that technical knowledge is a very important factor that hinders IT growth. Chwelos et al (2001) supports this finding, they stated that the level of management understanding of using IT to achieve organizational objectives may influence the adoption of IT innovation.

Results from the t test indicated that all three items considered in this factor discriminated between adopters and non-adopters of ecommerce. Thus, we conclude that a high level of organizational competence will positively impact ecommerce adoption. Therefore hypothesis number 2 is confirmed.

5.7 Market e-readiness

Market e-readiness is a discriminating factor between adopter and non-adopters of ecommerce. Adopters believe their customers and business partners are ready to do business on the internet while non-adopters think otherwise.

On further investigation we discovered that market e-readines is somewhat related to the level of infrastructural development. Infrastructure in Nigeria will need to improve further before ecommerce is able to expand. According to most of the respondents to the interview, computer penetration is week; such low penetration is due to the low annual income of most Nigerian workers. Access to Internet is limited and in most cases people have access to internet at their work places. The lack of Internet in homes has an adverse impact on ecommerce awareness amongst the citizen, which further demotivates banks willing to adopt ecommerce.

People without internet access or computers form habits over time that restrains them from embracing ecommerce. A bank customer used to conducting transactions at a physical bank location is used to been attended to by a bank staff, he knows he can ask questions when in doubt. He also knows what to expect when walking into a bank and the business rules are quite clear. For ecommerce to develop, customers need to know how to work with computers and be familiar with the internet. This will require some investments in learning.

A question to ask is why do adopters consider market e-readiness positively? One explanation is that the adopters have the few Internet aware customers amongst the vast majority of people. However, this is not the case; the adopters seems to believe that awareness has to be created by the banks and with time interest in ecommerce will pick up. The non-adopters believe there is no large enough market for banking services online and such do not invest in ecommerce activities. Therefore, hypothesis number 7 is confirmed. The findings from this research are consistent with that of Molla & Licker (2005).

5.8 Supporting Industries e-readiness

The presence of supporting industries e-readiness within the country context is expected to influence the adoption of ecommerce (Molla & Licker, 2005). However, it was supprising to observe that banks that operated within close proximity viewed the e-readiness of supporting industries differently. On further investigation, it was discovered that banks all had access to the same IT services. The view on e-readiness was greatly affected by costs versus benefits decisions. For instance, some banks were willing to pay more for the needed bandwidth (telecommunication transmission capacity) for their ecommerce activities while others considered the cost of additional bandwidth prohibitive and settled for paying for the minimum subscriber bandwidth.

The level of development of supporting industries in Nigeria, based on first hand evidence can be considered as low compared to developed nations like Sweden. This has a negative impact on the cost of services (Bandyo-padhay, 2002). Thus, we can conclude that the existence of adequate and a developed support industry will positively affect the adoption of ecommerce. Therefore, hypothesis number 8 is confirmed.

5.9   Government e-readiness

Government e-readiness was non significant within both the discriminant analysis and the item t-tests. These result suggest that government e-readiness does not explain any difference in ecommerce adoption amongst adopters and non-adopters in the Nigerian banking industry. The t-test analysis of the items within the factor showed that non of the items differentiate adopters from non-adopters of ecommerce. Adopters and non-adopters both share a common view concerning government e-readiness.

Government does not have any significant effect on the adoption of ecommerce; this suggest that businesses that adopt ecommerce do not do so because of an enabling government. Therefore, hypothesis 9 is not confirmed.

However, government can play a key role in the development of ecommerce in Nigeria by providing the telecommunication infrastructure, institutional support, and especially by to both facilitate and give official status to electronic transactions and documents (Palacios, 2003).

5.10   Rank of Ecommerce factors

The rank of the factors in descending order of impacts is shown below:

Perceived complexity

Perceived benefits

Organizational competence

Perceived compatibility

Supporting industries e-readiness

Management support

Market e-readiness

IT capability

Government e-readines

6 Conclusion

This study is an attempt to identify the factors that determine the likelihood of adoption of ecommerce in Nigerian banks. The objectives of the study was to understand the ecommerce adoption behavior of banks and the factors that could drive or inhibit the use of ecommerce in the Nigerian banking industry; and to rank the importance of such factors on the decision to adopt and use ecommerce.

Results from our statistical analysis provide a picture of the adoption of ecommerce in the Nigerian banking sector. Generally, the results support all the hypotheses but one; this is consistent with previous research in ecommerce adoption (Molla & Licker, 2005; Grandon & Pearson, 2004). Adopters of ecommerce were different from non-adopters in terms of topmanagement support, organizational competence, and IT capability.

A number of conclusions can be drawn from these results. Firstly, banks with a strong support and commitment to ecommerce from top management are more likely to adopt ecommerce. Secondly, banks that have the requisite IT and business resources (infrastructure and skills) for ecommerce adoption stand a better chance at adopting ecommerce. Thirdly, banks that have sound IT infrastructure in place are in a better position to adopt ecommerce.

The data analysis also showed that ecommerce characteristics have a major effect on the decision to adopt. Banks with more positive attitude towards ecommerce characteristics are more likely to adopt ecommerce. This result provides support for Roger's innovation theory. Three essential attributes of innovation that affect the formation of attitude are benefits, compatibility, and complexity. If ecommerce is viewed as better than the existing method of operations, consistent with the needs of the adopting bank, and is easy to use, then there is a greater chance that a favorable attitude towards ecommerce will be formed.

External factors also influence the adoption of ecommerce. A highly developed supporting industry will improve the adoption of ecommerce. The perception of the market banks operate in affects the decision to adopt. Adopters believe their customers and business partners are ready to do business on the internet while non-adopters think otherwise. The low level of government support did not stop adopters from adopting ecommerce; however, government can play a key role in the development of ecommerce in Nigeria by providing the necessary infrastructure.

The rank of the factors affecting adoption of ecommerce (in descending order of impacts) is: Perceived complexity, Perceived benefits, Organizational competence, Perceived compatibility, Supporting industries e-readiness, Management support, Market e-readiness, IT capability, and Government e-readines.

7 End Discussion

This thesis focused on "Factors affecting the adoption of ecommerce in Nigerian banks". Innovation diffusion theory was used as the theoretical foundation for the thesis. We used a mix of quantitative and qualitative approach during the study; however the study was largely quantitative. Data was gathered through self administered questionnaires while semi-structured interviews were used to gain a deeper understanding of findings from the questionnaire survey.

Typically, respondents to the survey questionnaire were involved in jobs that were related to ecommerce and in the case of non-adopters had knowledge of ecommerce. Communication with respondents was via email. This posed some challenges as communication with Nigerian organizations were still largely face to face. This obstacle was overcome by using telephone conversation in certain instances. Telephone conversations proved useful as it provided the personal touch that was missing in email conversations. Furthermore, we made use of contact persons with the various banks in our sample. This reduced the need to have personal conversations with all the respondents.

During the conduct of this research we learnt very early that it was essential to have a good understanding of the industry or companies in the sample. Thus, it was plus that one of the researchers had worked for several years in the IT department of one of the banks. It is advisable where prior experience is unavailable that researchers carry out a thorough study of the industry or sample before the actual research is carried out. The essence of this is to understand the language and bias of the sample.

Another problem experienced during the research was using SPSS for Windows; we had to learn to use SPSS within a short period. This was very demanding and could have negatively impacted the outcome of the research. Given the varied background of students admitted into the Master's programme, it is essential that a course in management research techniques is taken early in the programme. We believe this will improve the quality of theses in subsequent years.

7.1 Future Research

The main objectives were:

1. To understand the ecommerce adoption behavior of banks and the factors that could drive or inhibit the wide adoption and use of electronic commerce in the Nigerian Banking Industry, and
2. To rank the importance of such factors on the decision to adopt and use ecommerce applications in Nigerian banks.

These objectives have been achieved. This study focused on the business side perspective of the adoption of ecommerce. However one of the variables in the research suggest the existence of customers for ecommerce affects the wide adoption of ecommerce within the banking industry. Thus an area of further research is the adoption behavior of bank customers. Another area of future research is the replication of the study in other industries with modifications to suit the target industry. Such research could help in generalizations about ecommerce adoption in Nigeria.

Appendix 1

Item	Description
Top management support (MS)	
MS1	Management is interested in the use of electronic commerce
MS2	Management is supportive of the use of electronic commerce in business operations
MS3	Our business has a clear vision on electronic commerce
MS4	Our vision of electronic commerce activities is widely communicated and understood throughout the organization
IT Capability (IT)	
IT1	Our organization is well computerized with LAN and WAN
IT2	We have high bandwidth connectivity to the Internet
IT3	We have an established enterprise-wide IT infrastructure
IT4	We have sufficient experience with network based applications
Perceived Benefits (PB): Electronic commerce should help…	
PB1	Reduce cost of business operations
PB2	Improve customer service
PB3	Improve distribution channels
PB4	Reap operational benefits
PB5	Increase ability to compete
Perceived Compatibility (PC): Electronic commerce fits well our	
PC1	Organizational beliefs and practices
PC2	Existing technology infrastructure
PC3	Communication is very open in our organization
PC4	Our organization has a strong relationship with suppliers and customers
PC5	Our organization has a positive attitude towards electronic commerce
Perceived Complexity (PX): inverted	
PX1	Learning to operate electronic commerce is/would be easy
PX2	Interacting with electronic commerce is/would be flexible

PX3	My interaction with electronic commerce is/would be clear and understandable
PX4	It would be easy for me to become skillful at using electronic commerce

Organizational Competence (OC)

OC1	Our organization has a good understanding of electronic commerce business models that are applicable to our business
OC2	We have a good understanding of electronic commerce application solutions that are applicable to our business
OC3	Our organization has the necessary technical, managerial and other skills to implement electronic commerce

Market e-readiness (MK)

MK1	We believe our customers are ready to do business on the Internet
MK2	We believe our business partners are ready to conduct business on the Internet

Supporting Industries (SI)

SI1	The telecommunication infrastructure is reliable and efficient
SI2	The technology infrastructure of commercial and financial institutions is capable of supporting electronic commerce transactions
SI3	We feel that there is efficient and affordable support from the local IT industry to support our move to the Internet

Government e-readiness

GV1	We believe there are effective laws to protect consumer privacy
GV2	We believe that there are effective laws to combat cyber crime
GV3	We believe the legal environment is conducive to conduct business on the Internet
GV4	We believe that the government demonstrates strong commitment to promote electronic commerce
GV5	Government regulations allow electronic settlement of electronic commerce transactions

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