**A STUDY ON THE FACTORS AFFECTING E-COMMERCE ADOPTION IN NIGERIAN BANKS**

**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. 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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# **CHAPTER ONE**

# **Introduction**

## **Background of the study**

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**

Implementing successful e-commerce service is not as easy as most people might think. Many obstacles exist and they all revolve around three major pieces of the electronic commerce puzzle-money, technology and people. Hence, there is limited research on e-commerce in developing countries particularly in Africa. Sometimes the cost of avoiding e-commerce is greater than the cost of initiating it. Web technology is still developing. Despite the global reach of e-commerce, not all country has taken advantage of ecommerce. There is a big gap in the internet and e-commerce adoption between the developed and developing country, thus creating a digital divide.

Nigeria with a population of about l5Omillionpeople is a potentially lucrative market for e-commerce services. Nigeria being one the few nations in the world blessed with abundant mineral wealth, and entrepreneurial population and productive agricultural base. By virtue of size, population location is well positioned to the economic activities in Africa. E-commerce is an opportunity to use private sector to drive economic development.

The banking sector has been most successful with e-commerce in Nigeria. The main obstacles that prevent developing countries from leveraging the interest are lack of adequate communication infrastructure, technical know-how and information processing about the economy and the environment. The lack of adequate banking infrastructure is also considered as one of the problems faced by developing countries in building economic solution.

## **Research Question**

## 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?
2. What is 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?
3. What is the importance of such factors on the decision to adopt and use ecommerce applications in Nigerian banks?

**1.5 Objectives of the study**

1. To examine the factors that determine the likelihood of adoption of ecommerce in Nigerian banks.
2. 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.
3. To rank the importance of such factors on the decision to adopt and use ecommerce applications in Nigerian banks.

**1.6 Scope of the study**

The study is carried out on the factors affecting e-commerce adoption in Nigerian banks. The study is limited to twenty-five commercial banks.

**1.7 Significance of the study**

The following are the significance of this study:

1. The outcome of this study will educate bank managers and the general public on the role of E-commerce in reducing the operational cost of business organizations.
2. This research will be a contribution to the body of literature in the area of the effect of personality trait on student’s academic performance, thereby constituting the empirical literature for future research in the subject area

# **CHAPTER TWO**

# **REVIEW OF RELATED LITERATURE**

## **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 & PadillaMelendez, 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 technologyorganization-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.

**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).

## **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).

**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.

**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.

**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).

### **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.

**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.

### **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).

#### **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 (lacovou 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 lacovou 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.

#### **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.

#### **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.

### **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.

### **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.

### **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).

PERCEIVED TECHNOLOGY

FACTORS

. Relative Advantage

1

-

Cost of Technology

-

Benefit

-

Barriers

-

Risks

. Compatibility

2

-

Technological

Organizational

-

Existing Operations

-

-

Value Systems

. Complexities

3

Technological

-

Organizational

-

ELECTRONIC

COMMERCE

ADOPTION

ORGANIZATIONAL

FACTORS

. Top Management

1

Support

. Organizational

2

Competence

3

. IT Compatibility

PERCEIVED EXTERNAL

FACTORS

1

. Government eReadiness

2

. Market forces

eReadiness

3

. Supporting industries

eReadiness

Figure 2.1 Research model

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

## **3.1 Research design**

The study employs quantitative descriptive research design to examine the factors affecting e-commerce adoption in Nigerian banks.

**3.2 Sources of Data**

The data for this study were generated from two main sources; Primary sources and secondary sources. The primary sources include questionnaire, interviews and observation. The secondary sources include journals, bulletins, textbooks and the internet.

## **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.

### **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

**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.

### **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.

### **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.

### **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.

**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

## **Sample and sampling technique**

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.

**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 computting 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.

**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 nonadopters if the significance level is less than .05. The software package used was SPSS software for Windows version 13.

**CHAPTER FOUR**

# **RESULTS AND DISCUSSION**

# **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.

**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 nonadopters. The factors were later ranked according to their importance. Secondly, further insights into discriminating factors in the adoption of ecommerce were obtained using ttests. 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.

## **Preliminary Discriminant Function Analysis**

Using discriminant analysis, major differences were discovered between adopters and nonadopters 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.



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

 Table 4.2 Structure Matrix

##

## **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 nonadopters 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

# **4.2 Discussion of finding**

This chapter discusses the results from the statistical analysis. The results from the statistical analysis are analyzed based of the research model.

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.

**CHAPTER FIVE**

**CONCLUSION AND RECOMMENDATION**

**5.1 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.

**5.2 Recommendation**

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.

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# **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  |