Supervisory Team:

Director of Studies: Elli Georgiadou

Supervisor: Dr Geetha Abeysinghe

Prof Colin Tully

ii

TRADERN: A COLLABORATIVE MODEL
FOR IMPROVING SMALL BUSINESS PARTICIPATION
IN ELECTRONIC COMMERCE IN SUB-SAHARAN AFRICA

Dili (Okwudili) Ojukwu

School of Engineering and Information Sciences

Middlesex University

**Middlesex
University**

A thesis submitted to Middlesex University

in partial fulfilment of the requirements for the degree of

Doctor of Philosophy in Computer Science

December, 2008 9

Acknowledgements

Access Statement

I hereby declare that with effect from the date on which the thesis is deposited in the Library of Middlesex University, I permit the librarian of the University to allow the thesis to be copied in whole or in part without reference to me on the understanding that such authority applies to the provision of single copies made for study purposes or for inclusion within the stock of another library. This restriction does not apply to the British Library Thesis Service (which is permitted to copy the thesis on demand for loan or sale under the terms of a separate agreement) nor to the copying or publications of the title and abstract of the thesis. IT IS A CONDITION OF USE OF THIS THESIS THAT ANYONE WHO CONSULTS IT MUST RECOGNISE THAT THE COPYRIGHT RESTS WITH THE AUTHOR AND NO QUOTATION FROM THE THESIS AND NO INFORMATION DERIVED FROM IT MAY BE PUBLISHED UNLESS THE SOURCE IS PROPERLY ACKNOWLEDGED.

Signature: Date:

Abstract

The inception of the Internet has brought with it Electronic Commerce (E-Commerce) practices which have greatly transformed the ways firms conduct businesses globally. Internet-based E-Commerce, particularly business-to-business (B2B) holds the key for small businesses to compete on a level playing field with their big business counterparts.

Unfortunately, however, there is considerable evidence to show that small and medium sized enterprises (SMEs) in developing countries, particularly those in Sub-Saharan Africa (SSA), have not been reaping the benefits of this new commerce opportunity as their counterparts in North America and Europe. This chasm has given rise to another form of *Digital Divide*. This research has identified the major factors responsible for this state of affairs as the low level of participation by the SMEs in the SSA region in this global E-Commerce trade.

SSA region has been identified as a region with the lowest level of economic, technological and Internet development in the world. There are 49 Countries in this region inhabited by over 633 million people representing about 10% of the world's population. They are characterised by a low income, low-levels of human resource development, as well as severe structural, social, political and economic weaknesses. All these have combined to make the region the poorest region in the world.

It has been established that SMEs form the bedrock of every economy. There is also considerable evidence to suggest that the introduction of new technologies into organisations of all kinds and sizes has a major impact on the structure and functioning of the organizations. Furthermore, it has been established that B2B E-Commerce is contributing more to the global economy than all other forms of E-Commerce transactions. Equipping SMEs in developing countries, particularly those in SSA, by with emerging B2B technologies could help improve their growth potential which will invariably place them in a better position to contribute to the region's economic advancement.

Existing models have failed in attracting large numbers of SMEs in the region, partly due to the prohibitive costs of these technologies which make them unaffordable by the poor SMEs. This research has identified that the issues of Trust as well as the problems

associated with Fraud and Security also play a part in making E-Commerce unattractive to a lot of SMEs in SSA.. Current theoretical frameworks have been extended by developing a new taxonomy showing the various components of E-Business where the distinctions between E-Commerce, E-Government, Tele-Medicine and E-Learning are clearly identified.

This thesis seeks to find solutions to the identified problems by finding ways of attracting more SMEs in SSA to participate in the global E-Commerce endeavour. This is with a view to enabling them to leverage and maximise their E-Commerce potential, which in turn would help them exploit today's global E-Commerce opportunities. This will ultimately help them in contributing to the economic growth of the region.

As a way of making E-Commerce attractive, affordable and profitable, an architectural model has been designed which, it is believed, would make the deployment and implementation of B2B E-Commerce more achievable for the poor SMEs in SSA. This model, known as *Tradem* Model, combines the trado-cultural and modern methods of conducting business. This combination would help SMEs deploying the technology to conduct their businesses using both methods without compromising their growth.

Over and above everything else there is the benefit of a level-playing field which the SMEs in developing economies, like Africa, and particularly Sub-Saharan Africa, can capitalise on to leapfrog, improve and sustain their economic development and global e-business participation as a step towards bridging the digital divide.

CONTENTS

CHAPTER THREE

CHAPTER FOUR

APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF PICTURES

CHAPTER ONE

Introduction

"Unless African countries become full actors in the global information revolution, the gap between the haves and have-nots will widen, opening the possibility of increased marginalisation of the continent. This gap will increase the likelihood of cultural, religious and ethnic ghettos leading to regional and inter-regional conflicts" Ali-Dinar (1995).

Studies have shown that in spite of the progress recorded in the developed economies of North America and Europe, and the Asian Pacific region states like India and Indonesia in the area of information and communication technology (ICT), the *digital divide* is still widening (see for instance Dasgupta et al., 2005; Mbarika et al., 2005; Zhang, 2008). Part of the problem is that developing countries, especially those within the sub-Sahara African (SSA) region are still experiencing some teething problems in their bid to deploy these technologies.

Small businesses play a major part in the development of every economy. Also, ICTs particularly those dealing with online business, play a strategic role in the growth of any economy using them. However, research has shown that in most developing countries, particularly those within the SSA region, these technologies are not being used on a large scale, particularly by small and medium sized enterprises (SMEs). Therefore, this thesis investigates the factors that could bring this about. It also seeks to find ways of attracting more SMEs in SSA to participate in the global E-Commerce endeavour. This is with a view to making them capable of leveraging and maximising their E-Commerce potential, which in turn would help them exploit the global E-Commerce opportunities. This will ultimately help them in enhancing their growth potential.

1.1 **Purpose of the Study**

This study is primarily aimed at finding the ways to attract more participation in the global E-Commerce by SMEs operating in SSA. This task is to be accomplished in two ways. One is by developing an architectural model of B2B E-Commerce which seeks to make the adoption and implementation of E-Commerce technology cheaper than what is presently the case. The other is by investigating and identifying other deployment and implementation problems which have hitherto hindered the mass participation of SMEs in SSA in the global E-Commerce activities.

The new model which also seeks to help SMEs in developing countries to leverage their E-Commerce potential, becomes imperative as studies have shown that existing models of B2B E-Commerce have not provided the opportunity needed by SMEs (as well as many of the big businesses) operating in developing countries, particularly those in SSA to reap the benefits of the   E-Commerce technology.

It is also expected that this new model would help in creating the fertile ground which could attract more SME participation in the B2B E-Commerce endeavours. The assumption here is that by attracting more SMEs in developing countries to participate in the global E-Commerce transactions, the ever-widening digital divide gap between developed and developing countries could be made narrower.

The issue of digital divide has engaged researchers and commentators for quite sometime now. *Digital Divide* was made popular as a reference to the disparity that existed between rural and urban America in their use of the Internet and other ICTs (Okoli, 2003; Lu, 2001; TIA, 1995). In contemporary times however, the term is now being used to show the chasm existing between the developed and developing countries with respect to their access

to ICTs as well as the educational and business opportunities this access brings (Lu, 2001).

Furthermore, we strongly believe that the greater the number of small businesses in SSA which participate actively in E-Commerce and other ICT activities, the more likely the apocalyptic scenario and warning contained in the Communiqué issued by the African Regional Symposium on Telematics for Development as reported by Ali-Dinar (1995) would be averted.

To accomplish this onerous task, this study is designed to investigate and identify other deployment and implementation problems militating against the development of a sustainable E-Commerce practice among SMEs in developing countries, particularly those in SSA, and to proffer solutions on how to overcome these obstacles.

1.2 The Need for the Study

Most research efforts on ICTs and their adoption and impact on the community have been focussed mostly on developed countries (Moodley, 2003; Straub et al., 2001; Mbarika et al., 2005). Conversely, the SSA region has been identified by various research efforts as a region with the lowest level of economic, technological and Internet development in the world (Odedra et al., 1993; Petrazzini and Kibati, 1999; Okoli et al., 2005; Mbarika et al., 2005). Countries in this region inhabited by over 633 million people (10% of the world's population), are characterised by a low level of income making it economically the poorest region in the world and the region with the lowest level of technological development. Given that technology, particularly ICTs have been identified as catalysts to economic development and empowerment (Dutta, 1997; Jensen, 1999; Mbarika, 2005), this study has therefore come to make its own contribution towards the development of developing countries in general and SSA in particular. This in turn would help

in narrowing the ever-widening digital divide gap between the developed and developing countries.

Furthermore, while B2B has been credited with exponential growth in most developed parts of the world (Jayaram et al., 1997; Barlett, 2001; UNCTAD, 2002), the existing architectural models have so far failed to make meaningful impact in SSA. This failure can be partly blamed on lack of IT skills, the problems of fraud (security) and the cost of deployment and implementation, among others (Shemi & Magembe, 2003; Rao, 2003).

1.3 Research Question

Naturally, a study of this type elicits many questions. Indeed, it is possible to introduce more questions than can be answered. Initially, some questions were raised following from the review of relevant literature. Then, after the completion of the Pilot Study, a list of some of the worries expressed by the SMEs was drawn. This resulted in some of the questions being reframed while others were completely replaced with new ones. From this modified list, one dominant question emerges:

What effect will adopting a collaborative E-Business framework have on the level of SME participation in E-Commerce in SSA?

The idea here is that finding a solution to this question will impact heavily on E-Commerce practices among SMEs in the region, and by so doing, help in reducing the digital divide gap between the region and the rest of the world.

4

1.4 Thesis Outline

A brief outline of this document is as follows:

Chapter 1: Introduction

In this chapter, the subject and the investigation was formally introduced with reasons why the study is necessary. The chapter also presents the Research Questions and the Hypotheses derived from them.

Chapter 2: Literature Review

This chapter explores the empirical and non-empirical studies relevant to the subject of investigation. Touching on such issues as what E-Commerce is all about, the chapter also highlights the available architectural frameworks and models. Also discussed in this chapter are such issues as the historical and cultural bases for the research as well as the available wireless technologies. Worth noting is also the defence given for using SSA for this study.

Chapter 3: Research Methodology

This chapter opens with an exploration into some philosophical and historical underpinnings of the research after which it discusses some relevant research methods giving justifiable reasons (with references) why one method is preferred to another for this study. It also describes the Research Design and explores some research methods that could be appropriate for the study before finally selecting the research path to be taken. Also in this chapter, the Research Questions are formulated while the various approaches that will be used in data collection, analysis and model development and validation are specified.

Chapter 4: Data Presentation and Analysis

Following the conduct of a Field Study across three cities in Nigeria, a lot of data were generated. In this chapter, we present and analyse the data. We

also discusse the changes made in the instrument for data collection (Questionnaire) before the Field Study was embarked upon.

Finally, the first four hypotheses are tested in this chapter using the non-parametric technique of Wilcoxon Signed Ranks Test (Wilcoxon t-test).

Chapter 5: Model Design

The information gleaned from Chapter Two (Literature Review) as well as the results of the analyses of data collected from both the Pilot and the Field studies were used in designing a Collaborative E-Commerce Model. The focus in designing the Model is to increase the level of SME participation in Electronic Business through collaboration between and among small businesses based on the *Isusu* cultural framework. In this chapter also, an accompanying Business Model was designed while the roles governments can play in the implementation of the Model are also explored.

Chapter 6: Model Validation

Two surveys, using the Questionnaire, were conducted – one amongst Experts and the other amongst SMEs. The data collected from the two studies are used in validating the designed architectural Model.

Chapter 7: Conclusions and Recommendations

In this chapter, the conclusions of the various steps taken in the research project from the Introduction chapter to the results are summarised. This chapter also highlights some of the major contributions this project has made to knowledge. It finally makes recommendations for further studies as well as the significance of the findings of the project.

1.5 **Summary**

This study has come at a time when the gains being made by the adoption and deployment of E-Commerce technologies have helped in uplifting the economies of both the developed world and those of some Asian countries, notably India, Indonesia and Malaysia.

For the countries in the SSA sub-region, this research has come at a good time when there are international efforts to help in alleviating the suffering of the peoples of the region. It is hoped that the outcome of this project would help in raising the level of SME participation in this global trade in the SSA region.

7

CHAPTER TWO

Literature Review

2.1 Introduction

This research effort, as has already been identified in the preceding chapter, seeks to develop a business and architectural model of B2B E-Commerce which aim to ease the problems associated with the adoption and implementation of these technologies by SMEs operating in SSA. The expectation is that if the adoption and implementation of these technologies become a lot more affordable and accessible than is the case presently, particularly for the SME sub-sector, then more small businesses in the region would participate in this global information revolution.

The inception of the Internet has brought with it E-Commerce practices which have greatly transformed the ways firms conduct businesses globally. Internet-based E-Commerce offers considerable opportunities for firms to expand their customer base, enter new product markets and rationalise their businesses (Lunati, 2000). Electronic networking can also deliver critical information to farmers, extension workers and researchers fighting crises caused by famine (Adam, 1996; Panos, 1998). In addition to these benefits, E-Commerce offers firms the opportunity to create added value by producing new products, adopting completely new business practices, or changing their modes of conducting inter-business and customer relationships and interactions.

The level at which these benefits can be achieved by firms adopting E-Commerce depends largely on how effectively and successfully the firms integrate E-Commerce applications into their business functions. Ideally, E-Commerce technologies should be applied throughout the business value chain. In the manufacturing industry for instance, where product proliferation and shorter product cycles require greater speed and flexibility, the key to success lies not only on price competition but also on the ability to introduce sophisticated information links, forecasting capabilities and management

systems. Competitive performance is driven less by how a company manages its assembly operations and more by how it manages the organisation and logistics of its operation as a whole (from inventory to time to market) (OECD, 2000).

Even though there seem to exist some problems on how to adequately define, measure and quantify the impact of this form of commerce on the development of the firms deploying it, available data point to noticeable contributions to the economies of the countries where it has been successfully deployed (Esselaar and Miller, 2001; Lu and Farrell, (1990). In the United States for instance, an estimated $830 billion was generated through E-Commerce in revenue in 2000 alone. This represents an increase of 58% and 156% over the 1999 and 1998 figures respectively (Collin, 2000; Ying and Anjana, 2001).

As Best and Maclay (2002) observed, economic self-sustainability for the Internet in rural areas is key if we want to avoid common development failures associated with donor initiatives. Such donor initiatives like *Live Band Aid, Red Nose, Sports Aid,* etc, as noble and commendable as they are, have hitherto failed to solve the perennial problems of subsistence and sustainable survival in the parts of the world (like North Africa) which have benefited tremendously from such short-term schemes. This explains why Best and Maclay (2002) argue that empowering local communities on how to use the technologies of the Internet and E-Commerce will ultimately lead to real and sustainable development. Their argument is nothing short of the age-old maxim of empowering a child to fish rather than continually supplying them with fish. This argument also tallies very strongly with the findings of Khalil (2003), who established that there is a direct link between information access and poverty reduction. As observed by Madon (2000), electronic communication can also assist in the management of crises and poverty alleviation amongst international organisations.

There are numerous examples of projects which seem to validate the claims made by these researchers that E-Commerce, like other information and communication technologies (ICTs) generally, contributes to both poverty reduction and economic growth.. There is, for example, the Greater Horn of Africa Electronic Communications Network project funded by the United States Agency for International Development (USAID). The project is aimed at providing telephone-based network for electronic communications between the member states of the Greater Horn of Africa thus facilitating the exchange of crisis-related information. (published at: http://www.africa.upenn.edu/Hornet/horn_electn.html. Visited: 12/03/2005)

Another example is the Village Internet Programme by the Grameen Bank in Bangladesh which has succeeded (in spite of the inefficient and regulated environment) to bring cellular telephony to rural areas. The project was aimed at promoting poverty alleviation by reducing migration from villages to cities, creating information technology-related job opportunities for the rural poor and by creating familiarity with computers among the rural population of the country (Grameen Communications, 1998).

Furthermore, there is the SARI (Sustainable Access in Rural India) project in India which has demonstrated that the creation, deployment, and delivery of information and communication services and technologies in poor rural areas leads to improvements in health, empowerment, learning, and economic development amongst the poorest and most disadvantaged communities. The SARI project has also shown that such poverty-alleviating and development-oriented services can be realised in an economically sustainable fashion. Villagers in the areas where this project was operational now get affordable Internet services which they are also using in improving the quality of their lives (Warschauer, 2002; Mitra, 2002; Pentland et al., 2004).

In Nigeria, the introduction of mobile telephony has encouraged a new generation of 'netpreneurs' and 'm-preneurs' who use their mobile phones to generate income. The first GSM (Global System of Mobile Telecommunications) licence was granted in 2001 to MTN (Mobile

Telecommunications Network) Nigeria and ECONET Wireless Nigeria. Between then and 2006, there has been an increase in the number of operators such as GLO, V-Mobile, and M-Tel, etc (Ndukwe, 2008; Olubamise and Awe, 2008). This increase reflects the popularity which mobile telephones attract in the country.

According to the *Nigeria Newsday* newspaper, with the increase in mobile telecommunications operators also came an alarming increase in subscriptions. The paper, quoting available estimates provided by the Nigerian Communications Commission (NCC), stated that between 2001 and 2006, mobile telephone subscribers in Nigeria jumped from 266, 461 to 32.3 million indicating an increase of over 12,000 per cent (http://www.nasarawastate.org/newsday/news/economy/NewArticles25.html).

Pic 2.1: A Typical Road-Side 'Call Centre' in Lagos, Nigeria (Ojukwu, 2005)

One of the major by-products of the huge increase in mobile telephone subscription in Nigeria is the advent of the road-side 'call centre' mobile operators. During the conduct of Pilot and Field studies in Nigeria, it was observed that the sight of these road-side 'call centres' was common in the cities and villages of the country. These 'call centres' (some of the operators even call them 'tele-centres' and 'business centres'!) can be found operating under umbrellas, under trees and road-side shacks (please see Pics 2.1 and

11

2.2). We observed also that a lot of the customers who patronise these 'business centres' actually own their own mobile phones. However, they patronise the centres simply because it is cheaper to make calls from the centres than doing so from the customers' own phones.

The 'call centre' operators on the other hand make their money by cutting down on the cost of making calls through the use of 'booster' call cards which attract huge discounts from the network operators through the principle of bulk purchasing. The more phone cards one buys in Nigeria within a time period, the less one pays per unit card.

The proliferation of these 'call centres' has also given rise to the development of composite businesses such as mobile phone repairs shops (which cater for the repairs and maintenance of the increasing numbers of damaged handsets); mobile phone dealer-shops (which market re-conditioned or second-hand handsets, new handsets, mobile phone peripherals, and accessories). The number of traders engaged in importing the latest gadgets mainly from China, Indonesia and other Asian countries has also equally increased.

Pic 2.2: Another Road-Side 'Call Centre' in Enugu, Nigeria (Ojukwu, 2005)

It is in this context that this project aims to develop an E-Commerce model which can achieve the twin objectives of improving the accessibility of B2B Electronic Communication and easing the deployment and implementation

12

problems of B2B E-Commerce technologies among SMEs in SSA. This model also will help in increasing the number of small businesses participating in the E-Commerce business in the region.

2.1.1 **What is *E-Commerce*?**

There is no single, universally accepted definition or what Mougayar (1997) calls "Webster's" definition of the term *E-Commerce*. According to Duncombe et al. (2005) E-Commerce involves the sale or purchase of goods and services over computer networks by businesses, individuals, governments or other organisations. Zwass (1966) sees E-Commerce as the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks. Fraumeni et al. (2000) put it very simply by stating that E-Commerce is any transaction completed over computer-mediated networks (electronically linked devices that communicate interactively over network channels) that involves the transfer of ownership or rights to use goods and services. E-Commerce builds on traditional commerce by adding the flexibility and speed offered by electronic communications.

E-Commerce is a sub-set of a much wider Electronic Business (E-Business) evolution that was started by the introduction of personal computers (PC) and accelerated by the Internet (Saunders, 1995). The other sub-sets of E-Business, based purely on the observation from the literature (see Fig 2.1) are: Electronic Government (E-Government), Electronic Medicine (Tele-Medicine), and Electronic Learning (E-Learning). Earlier forms of E-Commerce were built around pre-existing contractual relationships and required expensive and complex custom-built software, dedicated communication links, and compatible equipment (Lunati, 2000). This explains why most of the users of the earlier versions of E-Commerce technologies (that is those prevalent in use before the advent of the Internet technologies) like Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) were mainly large organisations and their first-tier suppliers. The accessibility of the Internet, resulting from a combination of regulatory reform and

?

technological innovation, has enabled the expansion of E-Commerce beyond the framework of transactions between known (business) parties to a more complex network of commercial activities in which SMEs are progressively becoming involved (Lunati, 2000).

One of the principal forms of E-Commerce is Business to Business (B2B) E-Commerce. In this form of E-Commerce, electronic business activities are conducted directly between businesses. It encompasses the exchange of goods, services and information and the performance of various business transactions over public or private networks. These transactions include financial transfers, online exchanges, auctions, delivery of products and services, supply-chain activities, and integrated business activities. B2B is by far the most common type of E-Commerce (UNCTAD, 2001, 2002; Feldman, 2000; Barlett, 2001). The Internet as a B2B E-Commerce medium is boundless and allows us to make progress in seconds, not months, days, weeks or hours. It serves not only for distribution, but also as an infrastructure that provides new methods of communication and collaboration (Cunningham, 2001).

B2B has been growing exponentially since 1995 (Feldman, 2000; Lucking-Reiley and Spulber, 2001). Unfortunately, however, while this exponential growth has been widely noticeable and felt in most developed parts of the world (Jayaram et al., 1997; Barlett, 2001; UNCTAD, 2002), the existing architectural models have so far failed to make meaningful impact in the lives of most businesses, particularly SMEs operating in SSA. This failure can be partly blamed on the lack of IT skills, the problems of fraud (security) and the cost of deployment and implementation (Shemi & Magembe, 2003; Rao, 2003). The new model being developed in this research therefore becomes imperative in view of the multifarious barriers which have continuously militated against the ability of SMEs (as well as a lot of big businesses) operating in this region in reaping the benefits of the existing models.

2.1.2 Identifiable Architectural Models

Paltalidis and Georgiadou (2002) identified three architectural models of B2B E-Commerce. The classifications of these architectural models are generally based on who controls them, namely: the buyers, the suppliers or the intermediaries. One of the architectural models is known as the "Supplier-oriented model". This enables the supplier to provide an e-store that offers the company's products and/or services to its customers through the Internet. There is also the "Buyer-oriented model" which enables a buyer to open an e-market and invite potential suppliers to bid on the announced requisitions for quotations (RFQs). Finally, there is the "Intermediary-oriented model" which enables a third party (an electronic intermediary company) to offer an intermediary e-marketplace for multiple business buyers and sellers (Turban et al., 2000).

The identified architectural models have so far failed to adequately address the concerns of a lot of SMEs in SSA. Part of the reasons for this failure derives from the fact that the models are mainly technically-oriented. They therefore do not cater adequately for the human and business components which will enable them to meet the needs of the small businesses in SSA. In Gabon, for instance, a study conducted by Moodley (2002) found that B2B is seen by businesses as an extra investment cost with very uncertain returns.

Furthermore, due largely to the prohibitive cost implications in acquiring these technologies, the poor small business operatives (SMEs) in SSA do not have the financial muscle to engage in either the "Supplier-oriented" or the "Buyer-oriented" models. And so, they are left at the mercy of the intermediaries who end up exploiting them.

There are also some issues relating to the environmental, infrastructural and cultural aspects of the peoples living in the regions which are remarkably different from those existing in Europe and America. These deficiencies therefore make it imperative for a new model to be designed that would seek to reflect the unique characteristics of the businesses in the region. The

model being proposed in this research can be likened to a 'hybrid' which creates room for companies falling into the three identified models. It is a kind of one-for-all in which the supplier, the buyer and the intermediary can have a stake, in a form of collaboration.
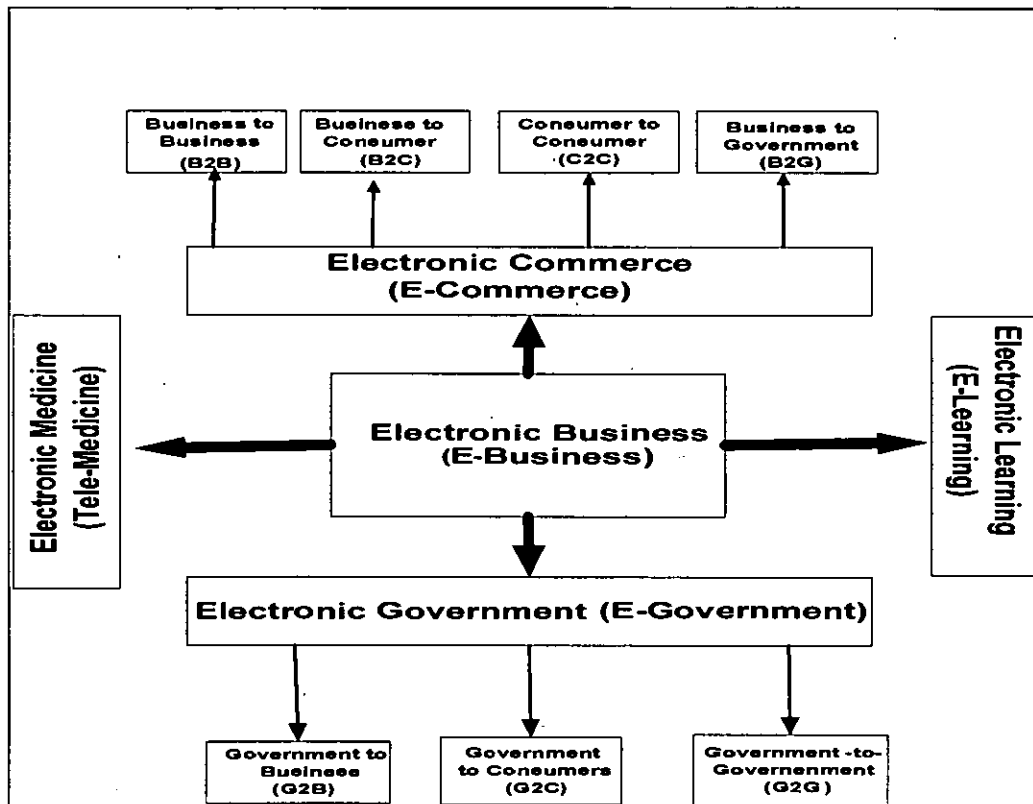
Fig 2.1: Electronic Business Taxonomy based on Literature

Over the last decade the momentum created by E-Business has given birth to various models of transacting business over the Internet. In turn a number of terms have been generated. As shown in Fig 2.1, some of the forms of E-Commerce propositions are Business to Consumers (B2C), Business to Government (B2G) and Consumer to Consumer (C2C). B2C involves selling directly from businesses to consumers, for example, Amazon.com which sells its goods and services to individuals. B2G refers to the growth in supply of goods and services for online government procurement. An example of this type of business takes place when a government employee reserves a hotel room or books for a flight for government officials over the Internet. C2C entails the exchange of goods and services from one consumer to the other using the Internet (and/or other proprietary networks, mobile radio networks,

16

interactive TV) as the media for contact and communication. A good example of C2C exchanges are the sorts that take place in some auction web sites like Ebay.com.

From the models discussed above, B2B is the most popular in terms of volume of trade. According to Barlett (2001), B2B marketplace which accounted for $226 billion in revenues in 2000 would continue to generate higher revenues year on year. Furthermore, the United Nations Conference on Trade and Development (UNCTAD, 2002) report showed that B2B E-Commerce accounted for 95% of all E-Commerce transactions conducted throughout the world in 2001.

Unfortunately however, some developing countries, particularly those in the SSA region, have not fully realised the benefits of this technology due to some adoption and implementation problems (Fleenor & Raven, 2003). The good news however is that the number of Internet users in these developing countries has continued to increase (ITU, 2003). In Nigeria, for instance, between 2000 and 2006, Internet users grew from 2 hundred thousand to 5 million (ITU, 2007). However, the digital divide gap is still widening. The result is that in 2002 for instance, while more than fifty percent of the population in the United States of America were online, and most of the E-Commerce conducted globally was North American-based, fewer than half the world's population had never even made a phone call (UNCTAD, 2002; Sherif, 2002).

Ali-Dinar's (1995) stark warning becomes even more significant given that available literature indicates very grave disparities between the developed nations and their developing counterparts in terms of economic, technological and Internet developments. For instance, more than 97 percent of all Internet hosts are in the developed countries which are populated by only 16 percent of the world's population (Petrazzini and Kibati, 1999).

These disparities become even more worrisome when considered that even within the so-called developing countries, the Asian-Pacific nations are doing better than countries in the SSA region. Various studies have established that SSA is the region with the lowest level of economic, technological, and Internet development in the world (Odedra et al., 1993; Petrazzani and Kibati, 1999).

Since such disparities underline the need for more focussed attention to the development needs of these economies, a very strong case is therefore made. to find ways of redressing the identified barriers which hamper the growth and development of this technology in SSA. It is therefore the need to redress the identified barriers that gave rise to this research effort which is aimed at developing a B2B E-Commerce model which can create the impetus for greater participation of small businesses in the E-Commerce revolution. It is further hoped that the developed model would also achieve the twin objectives of improving the accessibility of B2B electronic communication as well as easing the adoption and implementation problems confronting SMEs in SSA.

With more than half the world's population living in rural areas, observed Best and Maclay (2002), rural communities promise essential new markets, new producers, and new ideas. The researchers also believe that helping rural dwellers to help themselves develop also offers security for urban areas and the developed world by contributing to the grander goals of social and economic stability (and prosperity) through increased economic opportunity, new channels for learning, better communication with government, and improvements in health and wellness. As Mbarika et al. (2005) observed, SSA which is a major part of the world's second largest continent, is the region with the lowest level of technological development in the world. It has been established that ICT is a key for economic growth and development (Dutta, 1997; Jensen, 1999; Meso and Duncan, 2000; Odedra et al.., 1993; Okoli and Mbarika, 2003; Raman and Yap, 1996). Therefore, providing

businesses (particularly, SMEs) in the region with technological wherewithal (like the one being proposed in this research) will help in bringing more development to the region

In the Okinawa Charter on Global Information Society, the world's eight most developed nations known as the G8, emphasised that ICT is one of the most potent forces in shaping the 21st century (Ota et al., 2002). The G8, also in the Charter, renewed its commitment to the principle of e-*inclusion*, which states that everyone everywhere should be enabled to participate in, and no one should be excluded from the benefits of global information society. For this commitment to be worth more than just words, efforts such as this research project should be re-invigorated in order to translate this noble ambition into reality in these communities where the processes of production and distribution are still at a near stone-age level.

In the UNCTAD Report (2002), the United Nations (UN) under its Millennium Development Goal (MDG) set a target of halving the number of people living in extreme poverty by the year 2015. According to Romulo & Stofber (2001), over two billion people in 2001 subsisted on less than $2 per day, and more than twenty percent of these had neither heard a telephone dial tone nor connected to the Internet. In his Foreword in the UNCTAD (2002) report, former UN Secretary General, Kofi Anan warned that for the world to achieve the MDG in 2015, ICT must figure prominently in the effort. This study will therefore help in making MDG target a reality.

The Asian and the Pacific regions seemed to have heeded Kofi Anan's warning and embraced ICT in their business practices. It is no surprise therefore, that they fare a lot better in B2B E-Commerce than the other developing economies of the world. This is amply demonstrated by the fact that India is the world's major supplier of "off-shore" IT expertise through "Outsourcing". They are also leading players in the deployment of crucial broadband technologies. The governments in these regions make conscious

efforts to promote computer and Internet awareness among the populace (Alampay, 2007).

Furthermore, apart from the famous "hole-in-the-wall" project in India hailed by experts as ground-breaking (O'connor, 2002), there is also the SARI project which has led to improvements in health, empowerment, learning, and economic developments amongst the poorest and most disadvantaged communities in India (Warschauer, 2002; Mitra, 2002; Pentland et al., 2004). SMEs, entrepreneurs and individuals in those villages now use the technology in providing e-services like email, voice mail, telemedicine clinics and some forms of E-Government like tax returns and enquiries. There are also some other projects like the Grameen Village Pay Phones and the Gyandoot Rural Intranet (Bhatnagar, 2003) which are contributing to the people's quality of life.

The African sub-continent has the potential to emulate the Asia/Pacific example in the development of E-Commerce. For this to be feasible however, the underlying problems that have hindered this development have to be redressed. Since successful E-Businesses depend on a critical threshold of online users which constitute the precursor to a critical threshold of sellers and buyers (Fleenor and Raven, 2003), the first problem therefore, is how to increase the number of Internet users and the level of E-Commerce participation in Africa. There is also the need to increase the number of businesses participating in E-Commerce, since the more the businesses and individuals using these technologies, the more the participation. This argument can be likened to Metcalfe's Law, which explains that the value of a network increases with the square of the number of participants (Hanson, 2000).

2.1.3 *Globalists* versus *Localists*

In the past, the world market was readily accessible only to large multi-national and global companies located mainly in the developed countries of the world. Today, the presence of the Internet and E-Commerce presents a very important opportunity, especially to the developing countries of the world, to close the digital divide among countries and achieve global *eQuality* and *e-inclusion* in the new world economy. According to Ota et al.; (2002), a proposal presented to the World Trade Organisation (WTO) E-Commerce Initiative on behalf of the Japanese Ministry of International Trade and Industry (MITI) affirmed that E-Commerce can have positive effects for all economies contributing to the mutually supportive goals of sustainable economic growth, enhancing the public welfare, and fostering social cohesion.

In the midst of this optimistic view about the positive effects of E-Commerce on the economic life-line of the communities, some experts (Ike, 2004) however caution against some of the dangers imposed by a globalised economy especially on developing countries. Ike also talks about the fear that globalisation poses a major challenge to the identity, tradition and stability of peoples, nations and economies as it intrudes upon local communities, alters cultural values and destabilises national economies.

Some commentators have also expressed the fear that globalisation could deepen inequalities between the Western nations and countries with underdeveloped financial, communication and political infrastructure who would be unable to compete effectively in the global economy (see for instance, Mansell, 1998; and Wehn, 1998). This school of thought holds the view that given the level of poverty and the low level of technical and human resources prevalent in the developing economies, a spectre of dependency syndrome would be perpetuated in these countries resulting in a somewhat 'Internet Imperialism' where the West, with their economic and industrial might, would dominate and enslave the developing countries. This

dichotomised argument can be likened to the 'globalists' and 'localists' (or 'neo-populists') argument as enunciated by Madon (2000). While there is no intention to lampoon or belittle such fears, it is however important to point out that the rapid growth of the so-called Tiger economies of the Asian Pacific regions has demonstrated that such fears appear to be over-blown.

Khalil (2003) postulated that there is a direct link between ICT access and poverty reduction. According to him, unlike the industrial or agricultural revolutions which needed huge amounts of capital to operate, providing the rural communities with modern tools of communication could energise and empower them to shape and transform their environment and their fortunes. This has been amply demonstrated by the Grameen Village Pay Phone project (Grameen Communications, 1998) in Bangladesh; the Gyandoot Rural Intranet in India (Bhatnagar, 2003); and the burgeoning roadside 'call centres'. in Nigeria occasioned by the advent of mobile telephony in the country (Ojukwu, 2006). Statistics provided by the International Telecommunication Union (ITU, 2004) show that the access gap of mobile telephony between the high-income and middle-income economies is narrowing. Unfortunately; however, the figures also show that Internet access gap, like the digital divide, is still widening.

2.2 Historical and Cultural Background of the Study

The concept of culture has engaged the attention of a great number of thinkers. Like many other difficult, often subjective concepts, there exists some difficulty in conceptualising culture as a monolithic construct. This has given rise to a variety of approaches in which each expert looks at culture purely in the context of what their research interests are (Siakas, 2001; Groeschl and Doherty, 2000; Hofstede, 1983).

Culture can be seen as the totality of people's ways of life. It therefore encompasses every aspect of the ways people talk, walk, eat, dress, work, develop, conduct their businesses, etc. One of the most comprehensive works on culture has been done by Hofstede (1994) in which he sees culture as the collective programming of the mind, which distinguishes the members of one human group from another. Following from this definition, the researcher identifies four different levels of culture as a) national level in accordance with a person's country; b) regional, ethnic, religious and/or linguistic level; c) social class level, associated with educational opportunities and with a person's profession; and d) organisational or corporate level in accordance with what the employees have been accustomed by their work organisation.

It is pertinent to point out that in his earlier study, Hofstede (1980) had empirically conceptualised culture into distinct sub-constructs expressed in his four-dimensional schemes of

- a) **Uncertainty Avoidance** – the degree to which members of a society feel uncomfortable with uncertainty and ambiguity;

- b) **Power Distance** – the extent to which the members of a society accept that the power in organisations is distributed unequally;

- c) **Individualism vs Collectivism** – the extent to which a person sees himself as an individual rather than part of a group;

- d) **Masculinity vs Feminity** – preference for achievement, heroism, assertiveness and material success versus preference for relationships, caring, quality of life.

In his later work (Hofstede, 1990), he added a fifth dimension: **Time Orientation** which refers to the preference of the here-and-now as opposed to the future, to the previous four dimensions.

Our interest in this subject is to explore how African cultural traits influence the business relationships in the region which can have some applications in

23

the proposed model. A lot of research efforts have been geared towards understanding the impacts of culture on information, communication and technology (ICT) issues. According to Okoli (2003), the beliefs and values that people have ingrained in them by their cultural context significantly affect their thinking and perspectives, and hence their approach to using technology (see also Kransberg and Davenport, 1972; Hofstede, 1980; Bertolottie, 1984; Baba, 1995; Sun, 2002; Yeo, 2001; Minocha et al., 2003).

With respect to SSA, there are also some studies of note which have looked into the effects of culture on technology. Korpela (1996), for example examined the root causes of the obstacles affecting IT diffusion among the Yoruba ethnic group in Nigeria and concluded that culture had little influence on the effectiveness of ICT in that part of the Nigerian society. He went further to posit that a historical political economy that hindered true democracy played far more important role than culture in influencing ICT effectiveness. In a later study which compared West African, Australian and Middle Eastern information systems developments, Hasan and Ditsa (1999) established that culture is central in influencing IT adoption and development in those regions. Goodman & Green (1992) also argued that cultural and political factors explain the lack of IT diffusion in the Middle East because the Western assumptions that free movement of information has positive connotations violates the cultural environments of many Middle Eastern countries.

In most parts of Africa, particularly the West African sub-region, there is a wide-spread culture of collaboration as evidenced by the practice of what has been variously called Isusu (in Igbo Language), or Esusu (in Yoruba). In the francophone areas like Cameroun, it is called Tontine, while it is known as Stokvel in South Africa. In the western world, it is called "ROSCA" (Rotating Savings and Credit Association) or "ASCRA" (Accumulating Savings and Credit Association) (Bouman, 1994).

Isusu (also called *Bishi* in India) is a form of group self help practice in which communities, groups or individuals come together and agree to a form of rotational monetary, service, produce or labour contribution. The major characteristics of this practice is that equal amounts of money for instance, are contributed periodically (weekly, monthly, fortnightly, etc) and handed over to a group or a member of the group. This rotation continues until the last group or member receives their share. This money is very helpful as it provides the recipients some 'easy', tax-free money (it is a kind of soft, tax-free loan) to solve a business, domestic or personal problem. Some business-minded individuals and groups also use such soft 'loans' to start business ventures and investments. Others with different ambitions however use such 'bonuses' to satisfy some personal ambitions like marrying more wives!

This research is premised on the assumption that since the people have been participating in these 'resource sharing' schemes, SME collaboration would also be a workable arrangement. In this project therefore, we investigate the possibility of taking this practice to another level – the SME level. The idea here is to provide an opportunity for the participating SMEs to improve their strategic competitive advantage and business opportunities by sharing some operational facilities and resources.

The idea here is not to contribute money and hand over to a participating SME, but for the participating companies to pool their resources together and collaborate to innovate, compete and improve. Why, one may ask, do people practice this form of financial synergy? Or, in our view, what is the incentive for SMEs in SSA to collaborate? The answer to the first question is hinged on the *broom-strength* symbolism. According to African mythology and folklore, the strength of the broom lies in the unity, cohesion and bonding relationships existing between and among the individual sticks making up the broom. To destroy the broom, according to this mythology, one must take its component sticks one by one: a very laborious task indeed! This mythology is also reflected in the names given to children such as: *Igwebike* (Igbo for *unity is strength*) and *Njikoka* (Igbo for *collaboration* or *unity is supreme*).

Studies have also shown that E-Commerce is an important contributor to the learning process (which shapes economic performance) because it provides improved access to structured business information and it offers opportunities for innovation when it is embedded in manufacturing processes (Lundvall, 1992; Moodley, 2002). Furthermore, E-Commerce, and ICTs in general, are likely to play a pivotal role in the integration and coordination of globally dispersed production and distribution systems (Gereffi and Kaplinsky, 2001). It is our belief therefore that if SMEs in SSA are provided with an appropriate E-Commerce technology, they can improve their business processes which could ultimately lead to business and economic growth.

For the second question, SMEs in SSA need to collaborate in order to reduce costs. As Hsiao (2001) and Moodley (2002) established, one of the most common reasons given for not adopting Internet-based B2B E-Commerce in developing countries is the high cost of technology, and an unfriendly interface. One of the ways SMEs in SSA can overcome this problem is through collaboration (just as the *Isusu* scheme helped in providing financial and labour solutions to its participating members) (Bouman, 1994).

As Bouman (1994) has established, the *Isusu* scheme has demonstrated a culture of collaborative and co-operative endeavours in Africa. In the area of trading, Africa has a culture of open-air and face-to-face market transactional method. This appears to be antithetical to the virtual shopping culture which is a dominant characteristic of E-Commerce (Travica, 2002). Furthermore, as Mbarika et al. (2005) noted, consumers in SSA are not widely comfortable with computers or e-mail, which is necessary for the requisite trust to engage in E-Commerce. While business people and workers in government, education and healthcare are increasingly using e-mail, the average buying consumer does not yet use this facility.

In this study, a conscious attempt is made not to totally alienate the cultural traits of the people living in the areas where the study is being conducted. In

our view, there is room for a harmonious co-existence of both the African traditional ways of conducting business and those imposed by the Internet-based method. In fact, most studies point to huge benefits that await SMEs and big companies who combine B2B E-Commerce with their other or traditional methods of business dealings (see for instance Barlett, 2001; UNCTAD, 2001, 2002, 2003; Best and Maclay, 2002). As an example, a business concern (like the bamboo furniture maker in Pic. 2.3) participating in this kind of collaboration can still market their products and services using the electronic method while simultaneously using the traditional African face-to-face method. This explains why we explored the idea of using "Tradern" as a name for this kind of collaborative arrangement.

Unfortunately however, SMEs in SSA are at a disadvantage for various reasons including lack of finance, trust, security, infrastructure, technological skills, etc (Mbarika et al., 2005). Since we cannot address all these problems at once, we decided to look at how a new transactional method can improve the security, reliability and trust of the SMEs participating in such a model and their customers. The end result, it is hoped, will be to attract many more of the businesses in this group to participate in B2B activities.

2.3 Clustering for Global Outreach

The proposed model is a kind of clustering arrangement which enables the participating SMEs to collaborate at certain levels of their business operations. It is therefore not a merger. Merging entails total fusion or coming together of different corporate bodies to form a unit with each losing its original identity. As Ike (2004) warns, merging of businesses and globalisation of big firms poses a challenge to the ability to nurture and sustain micro, small and medium-scale enterprises (MSMEs) that are the bedrock of any strong economy. The catch-word for the envisaged model is *collaboration*. It is intended that participating businesses will share some facilities while still retaining their individual identities.

The cluster concept is not entirely new. In fact, one of the most popular industrial cluster propositions is the one propounded by Porter (1990). As LeVeen (1998) observed, while Porter's original thesis was applied to nations as a whole, he also recognised that the majority of economic activity takes place at the regional level. The main theme of Porter's thesis however deals with the competitive advantage of clustering for industries.

Porter's argument is that his brand of clustering delivers innovation and is based on the following hypotheses:

- Clustering delivers higher rates of innovation because it allows rapid perception of new buyer needs;

- It concentrates knowledge and information and the knowledge-based economy is most successful when knowledge resources are localised;

- It facilitates on-going relationships with other institutions including universities;

- It allows the rapid assimilation of new technological possibilities; and

- It provides richer insights into new management practices.

Porter (1990) looked at two types of clusters: vertical and horizontal. While vertical clusters include industries that are linked through buyer-seller relationships, horizontal clusters on the other hand, include industries which might share a common market for the end products, use a common technology or labour force skills, or require similar natural resources. There are many examples of industry clusters ranging from the small hosiery cluster in rural North Carolina, US, to the apparel/hosiery cluster in the north of Italy. Perhaps, the biggest examples of industry cluster are the Silicon Valley with its high concentration of computer and related electronics firms (LeVeen, 1998), and Hollywood (film-making) both in California, as well as Bangalore in India for software outsourcing.

Beyond the generally acceptable understanding of *industrial cluster* as "geographical concentrations of industries that gain performance advantages through co-location" (Doeringer and Terkla, 1995), there is considerable debate with respect to what constitutes an industrial cluster. As Jacobs and DeMan (1996) put it, there is no one correct definition of the industrial cluster concept. They postulate that whatever the definition that should be must compose of different dimensions of interest, including geographical and spatial clustering of economic activity, horizontal and vertical relationships between industry sectors use of common technology, the presence of a central actor, and the quality of the firm network, or firm co-operation. Rosenfeld (1997) goes a step further by including the size of the cluster, the economic or strategic importance of the cluster, the range of products produced or services used, and the use of common inputs.

Rosenfeld (1997) takes the view that an industry cluster is

> *"a geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, communications and dialogue, which share specialised infrastructure, labour markets and services, and that are faced with common opportunities and threats."*

According to Simmie (2004), one of the major problems of this concept is the fact that it does not provide "an *a priori* way of identifying the geographical scale or boundaries of a cluster." This appears to depend on functional inter-linkages that may extend all the way from inter-country connections down to a minority confined within cities.

One common theme is discernible from all attempts at defining this kind of cluster: it is similar to agglomeration economics. There is a very strong emphasis on geographical location of the industries composing this brand of cluster. Furthermore, there is a theme of commonality or similarity of businesses. These characteristics differentiate the cluster propounded by Porter (1990) from the collaborative arrangement model being proposed in

this research project. This distinction is very important as the participating members do not necessarily have to be physically located together in a particular geographical place. Of course, the nearer they are physically located to each other, perhaps, the smoother the administration and management of the model, hence the more beneficial it may be to the participating members.

Another distinguishing feature of the model being proposed here is that the businesses involved in this type of cluster arrangement do not necessarily have to be similar or complimentary. The only similarity between the participating companies is their use of inter-operable technological platforms through which they will be reaching their individual target markets via the Internet. Furthermore, the participating businesses do not of necessity have to be just SMEs. Larger companies who do not have enough resources to go it alone can also participate in the 'sharing' of the benefits of these E-Commerce technologies. Perhaps, the most important distinction is that participating companies in this type of cluster collaborate to share some resources which they may not be able to afford individually.

2.4 The Internet Solution

The Internet has been touted by various researchers as a 'great leveller' for small businesses, allowing them to compete directly with larger organisations (Czerniawska and Potter, 1998; Travica, 2002). According to Quelch and Klein (1996), a small business can quickly become a big player on a global scale by leveraging technology in ways that respond to customer needs, thanks to the Internet. The Internet represents one of the largest and most pervasive business networks existing today, perhaps, second only to the telephone network (although the Internet is by some measure an extension of the telecommunications network) (Raisch, 2001). From the author's perspective, the potential of Internet technologies in enabling efficient transfer

of information on a global scale is revolutionary. This availability of global information could be used for international trade, online digital libraries, online education, telemedicine, E-Government and many other applications that solve vital problems in developing countries (Okoli, 2003).

One of the most glaring benefits of using the Internet by SMEs is cost reduction. According to a study conducted by McCready et al. (2005), the use of the Internet by JILetting, a property letting agent based in Scotland, lowered their advertising costs because "although JILetting pay £20 a year extra for the Letting Web facility, they are not charged each time a property is let resulting in the fall of operational costs."

Various studies have shown that SMEs use the Internet and associated technologies generally for activities such as exchanging, publicising, interacting, transacting and integration. Activities associated with *exchanging* include swapping information between and amongst customers, partners or suppliers (CURDS, 2000; Michaelis et al., 2001). *Publicising* activities comprise advertising and marketing of goods and services online (Stansfield and Grant, 2003; CURDS, 2000). *Interacting* activities entail customers viewing and ordering goods and services online but making payment by traditional means (Foley and Ram, 2004; CURDS, 2000). *Integration* activities involve conducting both sales and purchases which are fully integrated online (Kettinger and Hackbarth, 2004; CURDS, 2000; Daniel, 2003). These activities are very important to our study as they will help us in shaping and integrating the activities that will be embarked upon by those who will be participating in the implementation of the designed model.

2.5 **Focus of this Study**

2.5.1 **Why Local SMEs?**

This study is focussed on SMEs in developing countries, particularly those associated with local crafts which are operating in SSA. Before delving into the reasons behind the choice of SMEs as focus for this study, it is pertinent to clearly define what constitutes an SME.

According to available literature, there is no single, universally acceptable definition of what an SME is mainly because of the wide diversity of businesses (DTI, 2001; Ojukwu, 2005). The reason being that "the classification of businesses into small/medium or large scale is a subjective and qualitative judgment" (Shamusuddeen, 2001). This means that most countries define the term in such a way so as to meet their developmental need as well as their economic realities and administrative expediency. There are however, some common indicators in most definitions of SMEs. These include the size of capital investment (fixed assets), annual turnover (gross output) and number of paid employees.

In Japan for instance, an SME is seen as any business whose capital does not exceed 50 million Yen and does not employ more than three hundred persons (Onah, 2004). In Nigeria, the definition of SME has changed from time to time, depending on the purpose of institutions and public policy. The Central Bank of Nigeria (CBN) which controls all banking and fiscal policies in the country defines SMEs as "enterprises in which total investments (including land and working capital) did not exceed N500,000 and/or the annual turnover did not exceed N5 million". However, following the persistent depreciation in the exchange rate of the local currency (Naira), the maximum size of capital investment for SMEs was raised to N5 million and the turnover to N25 million in 1990 (Twist, 2001).

In fact, even within a country, the definition may change to reflect the changing circumstances and specific objectives of the institutions. In Nigeria for instance, the law setting up the National Economic Reconstruction Fund (NERFUND) described SMEs as those with fixed assets plus cost of new investment (land excluded) not exceeding N10 million (National Economic Reconstruction Fund Decree, 1989).

One of the most widely accepted definitions of SME is that provided by the International Finance Corporation (IFC) which sees an SME as an organization with more than ten employees and with an asset base (excluding real estate) of more than $2.5 million (http://www.ifc.org/sme). For this study however, the definition as provided by the Nigerian Small and Medium Industries Equity Investment Scheme (SMIEIS) is acceptable. An SME according to SMIEIS, is "any enterprise with a maximum asset base of N200 million (about £1m) excluding land and working Capital and with the number of staff employed not less than 10 and not more than 300".

Having adopted an operational definition of what constitutes an SME, we will now explain why this group deserves a closer look in this study. One of the major reasons for focussing on SMEs is that, although the adoption of the Internet technology has occurred at a faster rate than any previous technology, the widening nature of 'digital divide' gap demonstrates that the changes brought about by this adoption have not occurred uniformly throughout the world (Mbarika et al., 2005). This can be more amply demonstrated by the fact that in 2000, E-Commerce generated an estimated $830 billion in revenue in the US alone, representing an increase of 58% and 156% over the 1999 and 1998 figures respectively (Collin, 2000). As has been established by Shemi and Magembe (2003), Africa's share in E-Commerce for the same period stands at a paltry $31 million (of which $30 million was accounted for by South Africa alone).

There is also the argument that, to date, there is little research carried out about the impact of Internet usage by commercial organisations in developing countries (Madon, 2000; Mbarika et al., 2005). Available statistics show however, that Africa is generally lagging behind in the adoption of E-Commerce (Esselaar and Miller, 2001), resulting to a low level of B2B activities in the region (Jensen, 2002). Furthermore, there is empirical evidence to suggest that SMEs in developing countries have been suffering a lot of disadvantages with respect to reaping the fruits of the Internet in the execution of their businesses (Gholami et al., 2004).

The targeted SMEs are those operating in the SSA region, even though, other SMEs elsewhere, and large businesses for that matter, can also benefit from the use of the designed model. The SMEs in SSA are being used in this study as it has been established by various research efforts that the region is lagging behind the rest of the world in the deployment and implementation of the B2B E-Commerce technology (Jensen, 2002; Shemi and Magembe, 2003; Mbarika et al., 2005).

It has also been established that SMEs form the bedrock on which a country's economic growth and stability rests (Ojukwu and Georgiadou, 2004). As Twist (2001) established, in 2001 small businesses represented more than 99% of all employers, employed 51% of private-sector workers, employed 38% of workers in high-tech occupations, provided about 75% of new jobs of the private sector output and represented 96% of all exporters of goods. It is therefore envisaged that by identifying and redressing the various factors that have hitherto hampered or prevented SMEs in SSA from effectively conducting their businesses online, they can be provided with the opportunity to participate more in this type of commerce thereby empowering them to contribute more meaningfully to the growth and prosperity of their societies.

34

Furthermore, in 1999, the American economy grew dramatically, adding almost 2.8 million new, private-sector jobs. Of these new jobs, SMEs created about 75 percent with the services sector topping the list with about 1 million, followed by manufacturing, finance and insurance (SBA, 2001). Similar stories emerge in every other developed economy. The differences lie in the magnitude of impact and the indices for measuring them. For example, in the United Kingdom, various studies by the Small Business Service (SBS) have pointed to the fact that SMEs "represent a powerful engine for economic growth and are a crucial part of the UK economy" (SBS, 2000). In 2000, for instance, of the over 3.7 million active businesses operating in the country, SMEs, including macro entrepreneurs, accounted for over 99% of UK businesses, and accounted for 50% of total UK turnover (£1 trillion), compared with 49% of turnover from the 7000 largest businesses (SBS, 2000).

In Canada, SMEs delivered 60% of the country's economic output in 2002, generated 80% of national employment and 85% of new jobs (Varian et al., 2002), while SMEs accounted for about 66% of registered jobs in Brazil (La Rovere, 2003).

In developing countries, the role of SMEs is of an equally strategic importance. As evidenced by the rapid transformation of the "Asian Tiger" countries of India, Malaysia, Indonesia, Taiwan and Hong Kong, SMEs are a major catalyst to any country's economic development. According to a study conducted in Nigeria by the Federal Office of Statistics in 2000, over 97% of all businesses in Nigeria employed less than 100 employees and are therefore classified as SMEs (Ariyo, 2000).

2.5.2 Technology and SME Growth

There is considerable evidence to suggest that the introduction of new technology into organisations of all kinds and sizes has a major impact on the

structure and functioning of the organization (Twist, 2001; Leblois, 2004). The introduction of what Ojukwu and Georgiadou (2004) called 'IBIS' (Integrated Business and Information Solutions) contributed to the growth of some Nigerian SMEs. Similarly, the innovative use of ICT at the milk collection centres in Indian villages greatly contributed to the growth of milk production in the country (Bhatnagar, 2003). There is also the case of the adoption of the "Internet Business Solution" in the United Kingdom, France and Germany which resulted in current, cumulative cost savings of 9 billion Euros to the organisations deploying them (Varian et al., 2002).

It has also been established that B2B E-Commerce is contributing more to the global economy than all other forms of E-Commerce transactions (Barlett, 2001; UNCTAD REPORT, 2002). The argument here therefore is that since SMEs form the greater number of business enterprises operating in every country, equipping them with emerging technologies would help them improve their profit margins which in turn would enable them contribute more to the socio-economic advancement of their communities. This can be facilitated by the proposed model of B2B E-Commerce. Furthermore, it is envisaged that the model would also provide them with the needed impetus to create more job opportunities, and to invest more on human resource development through funding for education and specialised skills training programmes. It is hoped therefore that making this technology available and affordable to SMEs will help them leverage their growth potential which in turn may result in some measure of economic growth in those regions.

2.5.3 The Case for SSA

Before making the case for the choice of SSA as an area for this research work, it is important to identify the geographical location of the region. The region is home to an estimated 633 million people across 49 countries. SSA covers the vast land mass starting immediately south of the Sahara Desert (below the Tropic of Cancer, latitude 23.5^0 north) extending southwards to 35^0 just north of South Africa. As shown in Fig 2.2, some North and South African

countries are not included in this project due largely to their unique socio-economic situation which makes them remarkably different from their SSA counterparts (see Mbarika et al., 2005). South Africa, for instance was projected to have earned about $0.5 billion in E-Commerce activities in 2002 (UNCTAD, 2002).

According to Austin (1990), the SSA region is characterised by low income and low-levels of human resource development as well as severe structural, social, political and economic weaknesses. In addition to these statistics is the fact that the region has also experienced scarred history of exploitation by their colonial masters. Furthermore, among the endemic afflictions plaguing the region are incessant civil and tribal wars (affecting over 8 million people); HIV/AIDS pandemic (with 70% of the world's cases occurring in the region); seasonal droughts affecting some of the countries in the region as well as hunger, mismanagement and corruption. Adam (1996) stated that many nations in the region continue to suffer from badly performing economies, high foreign debt, declining resources and social infrastructures, alarming population growth, degradation of the environment and other debilitating ailments.
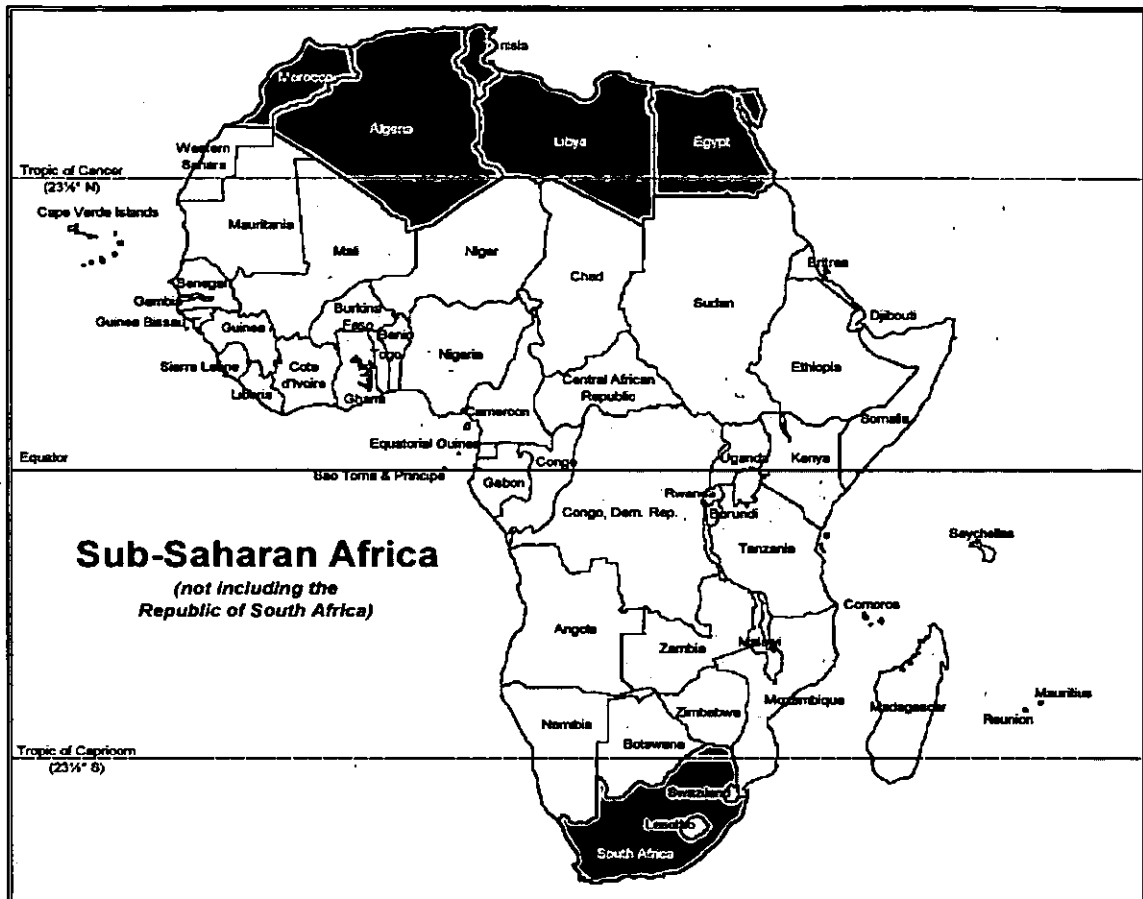
Fig 2.2: Map of Sub-Saharan Africa

Technologically, the region represents the least developed region of the world in terms of telecommunications infrastructure development (Odedra et al., 1993; Mbarika, 2001). In 1998, with 12% of the world population, SSA had only 2% of the world's telephone lines (White, 1998). As shown by these statistics, according to United Nations Office of the High Representative for the Least Developed Countries (OHRLLS, 2003), 33 of the 48 least developed countries (LDCs) of the world are in SSA, with more than 40% of the population wallowing in abject illiteracy with reported domestic products amounting to less than $1 a day for more than 50% of the population (NEPAD, 2001). Furthermore, while most western countries (like USA and the UK) have been enjoying Internet connectivity for more than two decades, Eritrea had its first Internet connection in 2000 (Mbarika et al., 2005).

2.5.4 The Case for Nigeria

A case is also made here for the choice of Nigeria for this study. According to the World Bank Group (see World Bank Report, 2004), Nigeria is an important country in West Africa because it accounts for 47 percent of the region's population and 41 percent of the region's GDP. With an estimated population of 132.8 million and a Gross National Product (GNP) of US$43.5 billion in 2002, the economic success or failure of Nigeria can affect not only the country but the whole of SSA. Furthermore, Nigeria is the most populous African country and it is estimated that one out of every six black persons on earth is a Nigerian (Shilgba, 2004). This is why any effort geared towards understanding how SMEs in the country make use of emerging technologies such as B2B E-Commerce in improving the quality of their products and services, which ultimately reflect on their growth potential, is worth the while. Added to all this is the fact that this researcher has got a lot of contacts and information on SMEs in Nigeria.

2.5.5 The Local Craftsman

As has been stated above (see paragraph 2.5.1), the aspects of SMEs covered in this study are those with direct link to local craftsmanship – in the production, management and training, or marketing of crafts.

African Craft (as used in this project) can be broadly classified into four categories: Furniture Making, Sculptures, Textiles and Pottery (see Fig 2.3). Each of these broad categories contains sub-divisions. Furniture making, for instance, contains such crafts as bamboo furniture, upholstery and home décor. Textiles can be sub-divided into cloth weaving, batik making, fashion designing and the making of hide and skins. Pottery contains clay design and ceramics, while Sculptures can be sub-divided into mask making, stone carving, metal works (black-smithery) and wood carving.
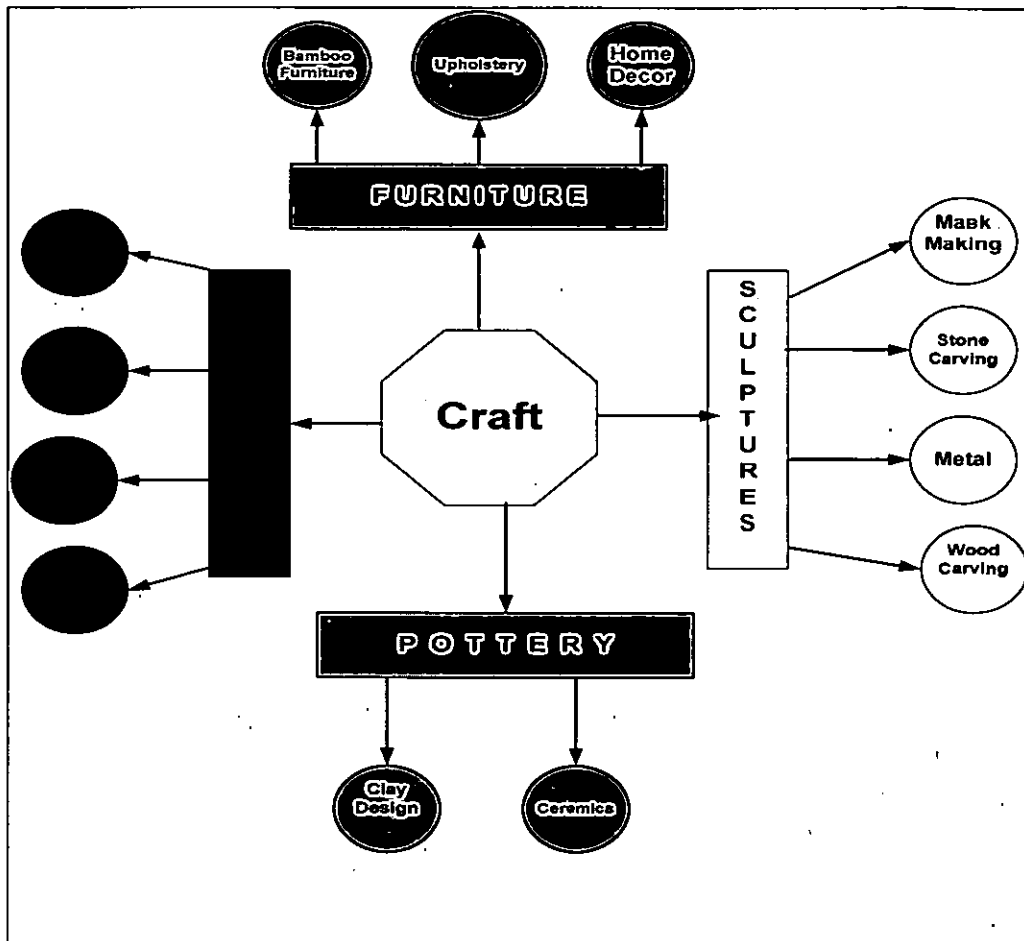
Fig 2.3: Branches of African Craft (As Used in the Study)

For this study however, we would concentrate mainly on mask-making and wood-carving (Sculptures), Bamboo furniture and Home décor (Furniture); and weaving (Textiles). There are two major reasons for this limited choice. One is that it affords us the ability to manage the items within the project scope. The other is that most of the by-products of these activities are portable and therefore can be easily packaged and transported from one location to the other without having them damaged or defaced.

In Africa generally and Nigeria in particular, local craftsmen (and women) are highly respected and revered. They are looked upon as people with 'special gifts and talents from the gods' and who have the powers to communicate with kindred spirits and translate their esoteric language to the people. They are also renowned people who are known both far and wide and whose works popularise the indigenous communities to the outside world. They thus

command a lot of influence and reverence as people with the 'sixth sense' whose intelligence should not be toyed with. They are therefore 'opinion leaders' of a sort. They also wield enormous economic powers, and contribute a lot to the economic well-being of the society by employing and training local youngsters in their trade and by enriching the people's culture through their creations.

In Nigeria, there are some groups of artists who collaborate in mounting joint arts exhibitions from time to time. Each group comprises crafts men and women who have different artistic interests and backgrounds (even though some of them have similarities in their creativity). One of the most prominent of such groups is the AKA GROUP who agreed to participate and co-operate fully in this research. Using them in this project will achieve two things: one is that it would "lure" them into participating in E-Commerce; and the other is that it would empower them to use the tools provided by the technology in order to exploit the global E-Commerce trade. It is hoped that by making them migrate their activities online, their growth potential and economic capabilities would be enhanced.
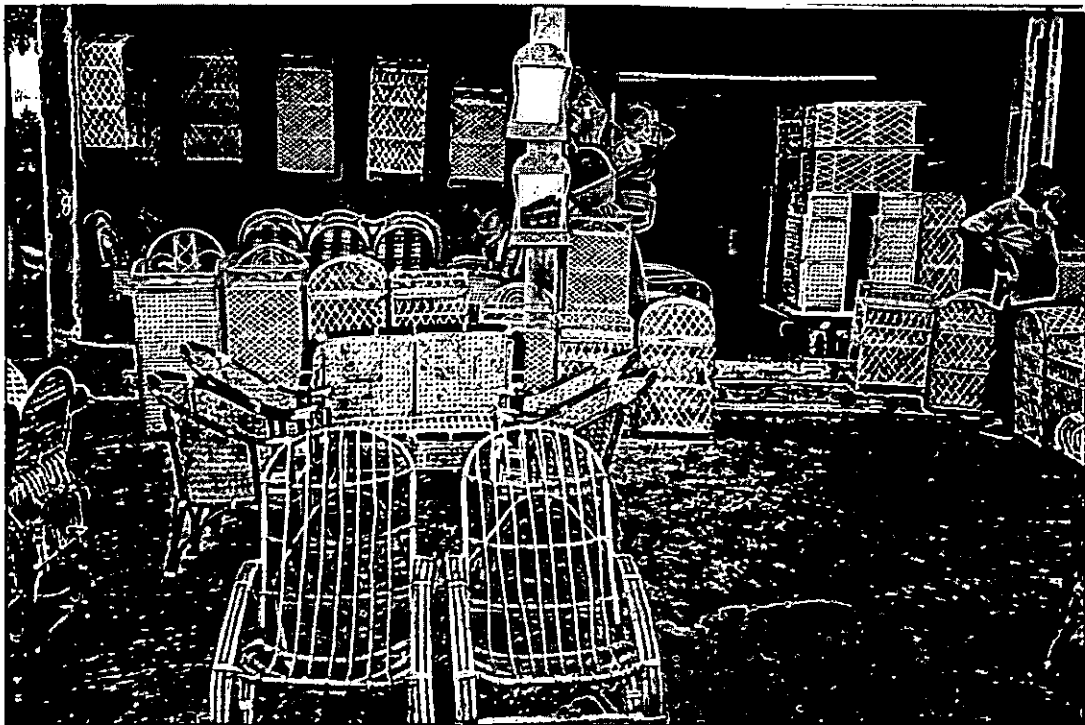
Pic 2.3: A Local Bamboo Furniture Maker in Enugu, Nigeria (Ojukwu, 2005)

41

2.6 Some Relevant Issues

There are some issues which strike at the heart of the proposed model. These issues (some of which can be seen as concerns to prospective participants in the model) include (but not limited to) cost, trust, security, culture and standards.

2.6.1 The Issue of Cost

The major argument as postulated in the hypothesis (H_1 section 1.5) is that more small businesses in sub-Saharan Africa (SSA) are likely going to be willing to engage in online transactions if they are satisfied that the cost of doing so is not only affordable but profitable to them. The issue of profit is very important because, even if the price of doing online business is very cheap, it still will not make any business sense if it is not profitable to the user. The primary assumption here however is that the cheaper the cost of using the Internet for business, the more likely it is for small businesses to be attracted to this method of conducting business.

As has been explored in section 2.2, the cost of acquiring the technologies of the Internet is currently very prohibitive, particularly to the poor small business operatives in developing countries. The technologies relevant to the Internet include the personal computer (PC), modem, telephone and of course electricity. However, one of the most expensive aspects of using the Internet for business is paying for the services of the Internet service providers (ISPs). According to Srinagesh (1997), ISPs offer their customers "a bundle of services that typically includes hardware and software, customer support, Internet Protocol (IP) transport, information content and provision, and access to individuals and information sources on the Internet". We observed that this state of affairs is still true today.

In Nigeria, one of the leading ISPs is Linkserve Ltd. It charges its customers annual fees of between N80, 000.00 (about £327) for its basic 'LinkStandard' hosting package which is suitable for small businesses to N170, 000.00 (about £634) for its LinkPro package. The 'LinkStandard' hosting package includes 500MB of space, 6GB for web traffic and 100 email accounts with 500MB of email storage space for each customer (http://www.linkserve.net/web_hosting.asp). If this is compared with, say Easyspace (www.easyspace.com) based in the UK which, for £85 per annum, offers a better package (comprising 2GB Webspace, 20GB bandwidth for web traffic and 100 mailboxes with 2GB storage facility) one can see what the small business operative in SSA is up against. It is therefore understandable that most of the SMEs used in this study regard high cost of using the Internet for their business transactions as one of the factors inhibiting small businesses in SSA from using the technology.

2.6.2 The Issue of Trust

Trustworthiness is a holistic property, encompassing security, safety and reliability. It is not sufficient to address only one or two of these diverse dimensions, nor is it sufficient to simply assemble components that are themselves trustworthy. Integrating the components and understanding how the trustworthiness dimensions interact is a challenge (Gilb, 2005).

Modern business activities are very complex and competitive in nature. This has given rise to a situation where it is no longer adequate for entrepreneurs to rely solely on their professional skills to give them the competitive edge and significant market advantage they require to thrive in their business (Moment, 2003). Developing professional trust with their customers is therefore very important to their success.

No matter what business you are in, the most powerful value-added ingredient you can contribute in any business strategy is the trust factor. The trust level in Corporate America in 2001 was at an all-time low, and suspicion of "all

things corporate" is on the rise (Moment, 2003). Customers and prospective customers are in search of trust in their business dealings. Although people do business with other people they know and trust, building trust and credibility does not happen overnight.

Trust is a fundamental requirement in any economic activity or relationship involving different individuals or firms (Clarke, 2002). This trust requirement becomes even more challenging and complex when the type of business is E-Commerce, particularly B2B. One major contributory factor to this heightened state of trust requirement is that this type of commerce is characterised by the "invisibility" factor (Moor, 1985; IDA, 2000) and is conducted in the virtual realm which, in most cases, does not offer fact-to-face contact among the participants. This lack of direct, physical contact is particularly a problem for SMEs (Deelmann and Loos, 2002). One major part of the reason is that the people in the region are still used to the traditional method of trading in which trading partners conduct their businesses by physically interacting with each other. One of the major impediments to adopting B2B E-Commerce for SMEs, particularly those operating in developing countries, is the prevalence of high entry barriers brought about, in part, by lack of effective reliance mechanisms aimed at enhancing system trust (Patton & Josang, 2004).

i) **The Need for Trust**

The emergence of globalisation facilitated by developments in ICTs has created more impetus for collaboration and partnership as avenues for achieving commercial success (Bryant and Colledge, 2002). For such collaboration and partnerships to succeed however, trust plays a central role. Trust, as a concept, can be seen as the assured reliance on the character, ability, strength or truth of someone or something (Merrian-Webster Online). Trust is a *sine qua non* in every interpersonal and commercial relationship. This is so because, as McKnight & Chervany (2001) observe, "it (trust) is crucial whenever (and wherever) risk,

44

uncertainty, or interdependence exist". It is even so if such a relationship is business oriented. Trust has been described as "the glue" in dyadic buyer-seller relationships (Pressey and Mathews, 2004).

B2B E-Commerce has been found to be the largest and most dominant sector of the online business in terms of turnover (Barlett, 2001; Laudon and Traver, 2005; UNCTAD, 2002). In the online environment, the decision to engage in a business relationship is a daunting one, especially when viewed from the perspective of the myriad of uncertainties in the area of product quality and vendor reputation which task the buyer's decision-making process (Grabner-Krauter, 2002). Kuttainen (2005) refers to trust in online business as "a mental short-cut" to a buying decision.

According to the Infocomm Development Authority of Singapore (IDA) (2000), a Gartner survey revealed that 12 times more fraud exists in Internet transactions while WebAssured found that fear of fraud is the primary reason users decide against making online purchases. This implies that even though the technology is available, some consumers and businesses still lack the trust and confidence in the network to conduct online transactions.

According to Raab (1998), the application of ICTs to the provision of goods and services in transactions that involve personal data requires trust, and has implications for the way trust is understood and managed. In fact, even the very basic notion of electronic communication and sharing of data depends on trust which as Burkert (1994) observed, hinges on three elements: trust on people, in organisations, and in technology.

In a study conducted in two Latin American countries, Brazil and Chile, Avgerou et al. (2005) explored the distinctions existing in such aspects of trust as:

- trust in *technological artifacts or processe;*
- trust in a specific *ICT-mediated service;* and
- trust in *govemment.*

They also explored the distinction between trust as an *interpersonal relationship* and trust as a *social or institutional phenomenon,* and posit that in the second situation, trust "captures citizens' expectations of fairness, impartiality and reliability *vis a vis* the impersoal and less tangible mechanisms, structures or processes underlying modern state and society at large".

In the traditional African setting, the practice of the 'Isusu' scheme, or 'ROSCA' as Bouman (1994) identifies it, is very popular. The scheme is characterised by a high level of trust amongst the participants. This is so, in spite of the fact that there are no signed agreements or documented memoranda (or articles) of understanding specifying sanctions for default. Yet, there is no strong evidence that point to a high level of default. The participants simply trusted one another in an 'our-word-is-our-bond' manner. This is based purely on long-standing association, familiarity, respect and relationships built over a long time which have helped in building up the trust level amongst them. Unfortunately, modern African societies seem to have lost a bit of this brand of trust as the scourge of advance fee and online scams is on the increase (Aniebonam, 2003).

ii) Components of Trust

In an E-Commerce relationship trust can be inter-personal; inter-organisational; as well as intra-organisational. Of the three aspects of trust however, inter-personal and inter-organisational are the more prevalent and indeed, relevant ones to E-Commerce relationships between parties. This is because they affect the business relationships between parties. *Inter-personal trust* (IPT) is the trust relationship existing between two individuals, especially in a consumer-to-consumer (C2C) setting, or an individual's trust

46

toward another specific party or the trustworthiness of the third party (Tan & Sutherland 2004). *Inter-organisational trust* (IOT) on the other hand, is the trust relationships existing between two business enterprises as found in a B2B setting. While *intra-organisational trust* is that which exists within an enterprise, between divisions, departments, sections, offices and branches.
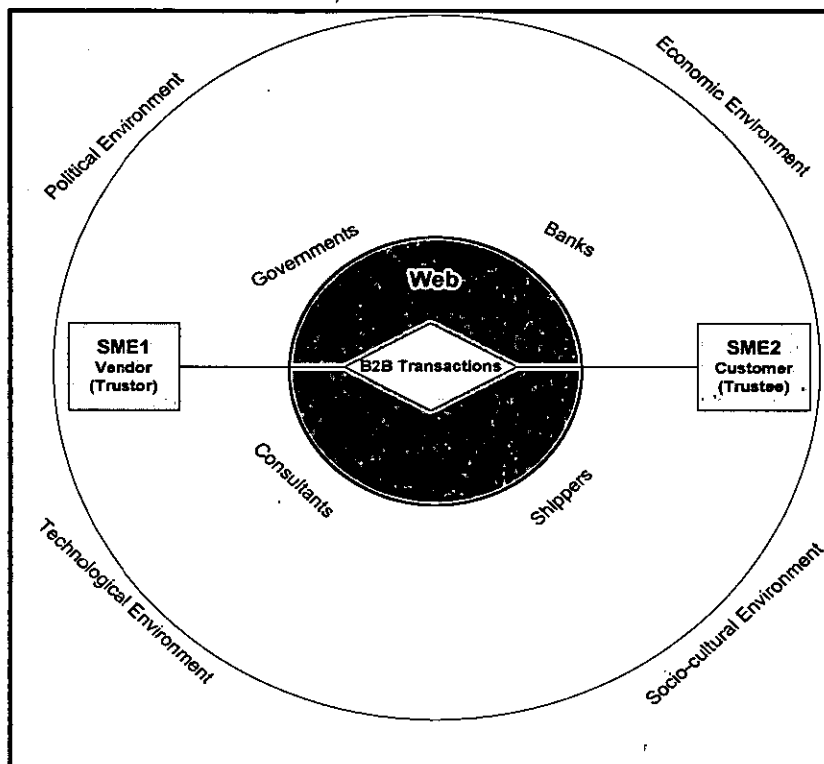
Fig 2.4: Collaborative B2B Trust Environment (Ojukwu, 2007)

The literature identifies three dimensions of trust in an E-Commerce vendor-customer relationship as: competence, integrity and benevolence (Putnam, 2001; Chen & Dhillon, 2003). 'Competence' is the ability of a company to fulfil promises made to the customers; 'integrity' looks at how consistent, reliable, and honest the company's acts are; while 'benevolence' refers to the ability of the company to hold its consumers' interests ahead of its own self-interest and indicates sincere concern for the welfare of the customers.

It was observed that in a collaborative B2B E-Business environment, trust issues are viewed from four broad perspectives: the vendor, the customer, the technology, and the interactions (relationships, transactions) between the vendor and the customer. As shown in Fig 2.4, further analysis of trust literature also indicates that there exists a fifth element: the intermediating agencies or facilitators (Ojukwu and Georgiadou, 2007).

As shown in Fig 2.4, facilitators include: governments, banks (and other financial institutions), consultants/experts and, in some cases (depending on the nature of the relationship) shippers (or postal and shipping agents). Governments create the enabling environment (through legislative and enforcement functions), banks act as both media for financial exchanges and assurance (or insurance) agents to the parties in the relationship; consultants advise, maintain and upgrade the technology that facilitates both the security of the transactions and the privacy of the participants; while (again, depending on the nature of the commodities being traded) shipping agents (like postal services, DHL, UPS, etc) facilitate the exchange of the commodities from the vendor to the customer. The vendors, customers and facilitators therefore make up the main stakeholder groups in the B2B relationship. As shown in Fig 2.4, the activities of the stakeholder groups are influenced by such external environmental factors as political, economic, technological and socio-cultural.

For an initial transaction to take place there is a strong element of trust between the parties. One party must be willing to reduce the complexity involved in deciding whether to depend on another (known as the "trustee") or not (Meents et al., 2003). This becomes more imperative given that there is inherent inability on both parties to control the actions of each other or to correctly predict each other's behaviour. Furthermore, the trustworthiness of each of the parties is not easily verifiable as is the case in a traditional face-to-face transaction (Pavlou, 2002). However, as Gefen (2000) explained, as long as the trustor is convinced that the other party (trustee) can be trusted in living

up to their agreements, the trustor can reduce the decision complexity by ignoring any other potentially negative behaviours of the trustee.

In any B2B relationship, the trustor-trustee roles are interchangeable as either of the parties can assume the role of a trustor or trustee at one point or another in the life of a transaction. If for instance, SME1 (Fig 2.4) supplies a commodity to SME2 before receiving the payment for the item, SME1 becomes the trustor and SME2 the trustee in this particular transaction. If on the other hand SME2 makes payment in the understanding that SME1 will deliver the goods, then SME2 becomes the trustor for the transaction. The roles of the partners are enriched when customers themselves become vendors of similar or different products and services. Early positive experiences can enhance their trust in such dealings. However, a negative experience may destabilise an otherwise smooth operation. Provided that the payment takes place before SME1 dispatches the commodity to the shippers or directly to SME2, SME1 does not have to worry in the same way that SME2 is concerned. SME2 can part with their money and 'trust' that everything will operate in the expected manner and therefore they will receive their goods. In turn these goods will be of the correct specification and quantity.

The trustor/trustee relationships can therefore be defined from the perspective of who of the two makes the first move - from the sequence in which their involvement in a particular transaction occurs. In other words, the first to deliver (either financial or material items) becomes the trustor while the receiver in this context becomes the trustee.

In a business to consumer (B2C) scenario however, the trustor-trustee role is not usually exchangeable. The business (vendor) is usually the trustee while the consumer (customer) the trustor. One good example of this kind of relationship exists between Amazon.com and its customers where the customer pays for the goods and hopes that Amazon.com delivers the goods paid for. From this standpoint, the customer is the trustor (paying for a

commodity) and believing the trustee (Amazon.com) to deliver the goods after processing the payment.

Trust, as a concept, can be seen as the assured reliance on the character, ability, strength or truth of someone or something (Merrian-Webster). Trust is as important in every B2B activity as it is in every sphere of human relations. In a B2B transaction and indeed every economic activity, Trust is a fundamental requirement (Clarke, 2002). Trust is a catalyst for human co-operation as it allows people to interact spontaneously and helps the economy to operate smoothly (Patton & Josang, 2004). Trust issues are covered in Questions 3 (d, e and f), 5 (d, e, and f), 7 (c, d, e and f) as well as 12 (e) in the questionnaire.

There are three main stakeholder groups on Trust issues in a B2B E-Commerce environment: the business organisation, the customer and the consultant. Another three are the society, the government and the Internet user. In this research work, Trust is viewed from the point of view of the business organisation – particularly, the micro, small and medium sized business (MSMEs).

Based on the above discussion therefore, we posit that there are six broad critical Trust areas in a collaborative B2B E-Business environment viewed from the perspective of the SME: Internet Technology; Online Transactions; Customers; Suppliers; Collaborative Group Members; and Consultants/Experts.

In our view, 'Internet Technology' refers to the architecture, protocols, networks (including intranet and extranet) as well as the various back-end and front-end technical components which support online transactions. 'Online Transactions' include all information and commercial exchanges being conducted with the aid of the Internet technology, at any point in the life of

such activities. 'Customers' refers to the organizations which engage in online transactions with others in B2B settings. 'Collaborative Group Members' are those businesses which belong to a collaborative B2B network group; while 'Consultants' are the experts who facilitate the use of the Internet in order to enable businesses (SMEs) carry out their online transactions. The Consultants do this through (their professional efforts like) managing, maintaining and upgrading the sites and the technology (Ojukwu and Georgiadou, 2007).

iii) Cues for Engendering Online Trust

Similar to Trust generally, inter-organisational trust (IOT) is based on experience over time. One of the major difficulties in establishing IOT is the challenge of making a success of the initial exchange. As Pichler (2000) observed, establishing initial trust can be a major challenge to newcomers in E-Commerce, particularly those who do not have well established off-line brands. Patton & Josang (2004) also postulated that initial trust is very important in any business relationship because merchants cannot build transaction history without it. Transaction history forms a major building block to lasting IOT.

One of the major impediments to adopting E-Commerce for SMEs, particularly those operating in developing countries, is the prevalence of high entry barriers brought about, in part, by lack of effective reliance mechanisms aimed at enhancing system trust (Patton & Josang, 2004).

Some factors are very central in wooing Internet users to trust an E-Commerce web site (Sisson, 2002; Lee, 1999; Riegelsberger & Sasse, 2001; Lumsden & MacKay, 2006). For the customer, most traditional cues for building trust in the physical world such as the warmth of a shop assistant offering to help you; the size and layout of the shop floor; and the ability of the customer to see or feel the quality of the products before making a purchase decision are not available online (Patton & Josang, 2004). In order therefore

to attract and keep online customers' trust, some more affective approaches have to be adopted. This becomes even more imperative given that E-Commerce involves interactions over space and time, and hence requires more trust cues than in a traditional (physical) shopping environment (Riegelsberger, 2003). Most current strategies in E-Commerce trust-building centre mainly on cognitive trust even though some human trust decisions are based on affective reactions, which can be triggered by interpersonal cues.

Based on the above discussion, we can conclude that some cues capable of engendering online Trust include (but not limited to) professionalism of design; longevity; service; selection; testimonial (positive anecdotal comments from previous users); personal experience; and the presence of some trust-assurance indicators (eg presence of known security vendors like VeriSign, etc). There is also the need to avoid such human computer interaction (HCI) pitfalls as difficult interface; poor navigation; and poor user-friendly designs.

iv) Ways to Enhance Trust amongst SMEs

SMEs in developing countries suffer from a plethora of disadvantages which hamper their efforts to join the rest of the world in exploiting the benefits of E-Commerce. According to Goldstein & O'Connor (2000), a lot of SMEs in developing countries are still grappling with some governmental, institutional and technical problems such as E-Commerce requirements, legal norms and standards covering among other aspects contract enforcement, consumer protection, liability assignment, privacy protection, intellectual property rights). There are also those problems relating to process and technical standards (e.g. regarding the way payments are accepted on the Internet and products are delivered to the final user, security, authentication, digital signatures, and connectivity protocols).

As Ojukwu and Georgiadou (2007) observed, there have been some indications that some of these issues have been receiving due attention by both the governments and private-sector entrepreneurs in some of the

developing countries. According to IDA (2000), in Singapore for instance, the government in 2000 announced plans to position the country as an E-Commerce hub through the implementation of such initiatives as:

a) Establishing a secure E-Commerce environment;

b) Building confidence in E-Businesses;

c) Building confidence in consumers to transact on the Internet; and

d) Educating and increasing awareness of the benefits of E-Commerce (IDA, 2000).

It was therefore not surprising to see that of the 127 nations which featured in the current World Information Technology Report published by World Economic Forum (WEF, 2008), Singapore came fifth after the US as the country with the highest networked index. However, Singapore's ascendancy and position in the global rankings was not reflected on the other developing countries' positions, particularly those from SSA. According to the rankings, 24 of the 50 countries on the bottom half of the table are from SSA.

One other way in which SMEs in developing countries can engender IOT is to use technological solution to directly address the risks involved in E-Commerce transactions. This therefore calls for improved payment systems like using the escrow (or mediator) approach favoured by most of the respondents in the IDA (2001) study and as suggested in this project. Banks are known to be amongst the facilitators of B2B relationships. If a customer is assured that the payment he has made can be retrieved if the goods paid for are not received, then, all things being equal, he may be willing to deposit his payment into a bank.

Approaches to trust building in B2B relationships can be both cognitive and affective (Corritore et al., 2001; Riegelsberger, 2003). One of the affective IOT building strategies is communicated through the web interface. Fogg et al. (2001) established that people's perceptions of web credibility can be

determined by such factors as physical address details and high quality photographs of employees. There is also the need for the provision of company information that is easy to find; prices (including taxes and shipping costs) early in the interaction.

Furthermore, web designers in these regions must strive towards establishing secure online environments for users. One of the ways of achieving this is through the use of public key infrastructure (PKI) which addresses the key issues of authentication, confidentiality, integrity and non-repudiation required for secure online transactions IDA, 2001). *Authentication* control ensures the establishment of the right identity for the parties involved in the transaction. *Confidentiality* is concerned with keeping personal details of the participants out of reach by a third party. *Integrity* addresses the data and information shared online making sure no alteration takes place; and *non-Repudiation* control ensures that the parties cannot disown the transaction by, for instance, exploiting the non-personal nature of E-Commerce.

2.6.3 Security and the Collaborative E-Commerce

> *The Web is an exciting but unstable place to do business. Both the rewards and risks are high. Security should not be an afterthought in developing a strategy. It is an integral part of setting up sustainable new channels of communication and business. Ignore it at your peril* (Jolly, 2003).

i) Introduction
Security has assumed a very important dimension in considering the adoption and implementation of E-Commerce strategies and technologies. Securing your data and information in an online environment is not drastically different from securing your property in the real world. The basic difference in the E-Commerce environment lies in the number of people who have access to your web business site and the virtual nature of the environment.

Security has often been cited as the number one impediment to the growth of E-Commerce (Greenstein & Vasarhelyi, 2002). Various surveys have shown why security issues should not be toyed with in the design and implementation of E-Commerce strategies. According to an FBI/CSI study conducted in the United States of America (USA) in 2002, 90 percent of the 503 organizations surveyed detected computer security breaches in their operations resulting to a reported loss of $456 million (Jolly, 2003). Since only 44 percent of the organizations which took part in the survey were able to quantify their losses, it can be concluded that the losses could be more than has been stated.

Also in the UK, a study commissioned by the National Hi-Tech Crime Unit (NHTCU) in 2002 reported that over 3000 incidents of computer-enabled crime were experienced by the 105 UK-based organsiations which took part in the study (NHTCU/NOP, 2002). Jolly (2003) estimated that the total loses to the UK companies which took part in the survey would be US$228 million. This figure, though not statistically significant, shows how staggering the level of losses being encountered by businesses involved in E-Commerce.

ii) **Types of Security Concerns**

Judge & Ammar (2003) identified four major security concerns for those involved in   E-Commerce transactions. These are

   a) Identification and Authentication;

   b) Validation and Unauthorised Access in Transmission;

   c) Non-repudiation and Traceability; and

   d) Storage Security and Retention.

Security is another very important issue affecting the level of individual and corporate participation in E-Commerce transactions. The result of the Pilot Study conducted amongst SMEs in Nigeria (see Appendix 1.2) shows, among

55

others, that one of the major inhibitions to the participation of small businesses in E-Commerce is the issue of security.

In a sense, Security can be treated as a sub-set or component of Trust. From this perspective, the argument is that Security helps to bring about Trust. The other components of Trust are safety and reliability. The assumption is that if small business operators feel that their online transactions are secure, safe and reliable, they are bound to have confidence and trust on the system.

Security in the technology of E-Commerce is another issue. It is strongly believed that if SMEs feel that their transactions guaranteed for security, confidentiality, identification of sellers and buyers, verification of buyers' solvency and guarantee of delivery, then all things being equal, they are more likely to embrace the electronic business methods. One of the most discussed issues in the area of security is the confidentiality and safety of online payments.

The technologies of the Internet provide security to online payments through the widely accepted Secure Socket Layer (SSL) standard. This is a set of built-in browser protocols initially designed by Netscape to protect card-based financial transactions on the Internet (Petrova, 2002). A more secure and complex bank-centered Secure Electronic Transactions (SET) software is being used more and more by online payments providers. Furthermore, there are the domestic and international wire transfer systems being used in Internet banking, including the Bank Internet Payment System (BIPS) and well as the Society for Worldwide Inter-Bank Financial Telecommunications (SWIFT) systems. The proposed model encourages banks and financial institutions in SSA and other developing countries to adopt online payment systems and practices that will meet their clients' needs as they migrate their businesses from traditional to electronic formats.

iii) The Issue of Standards

The issue of maintaining universally acceptable standards in the conduct of businesses is very important. It becomes even more important when it concerns the conduct of businesses on the Internet because of the 'faceless' nature of the network. There are both official and unofficial bodies which strive to maintain some degree of commonality and standard in the business language, taxonomy, business process, and methodology that can be used as foundation for communication, collaboration, and commerce via the Internet.

According to Raisch (2001), some of the examples of the bodies monitoring the standards of Internet transactions include:

- RosettaNet – which is the standards organisation for the computer and electronics industries;

- OBI – this stands for Open Buying on the Internet for MRO-type products;

- OASIS – that is, Organisation for the Advancement of Structured Information Standards;

- ANSI – American National Standard Institute;

- UN/EDIFACT –United National Directories for Electronic Data Interchange for Administration, Commerce, and Transport;

- WC3 –World Wide Web Consortium;

- IEEE – Institute of Electrical and Electronics Engineering (an international standards setting body);

- ETSI - European Telecommunication Standardization Institute; and

- UDDI – Universal Description, Discovery, and Integration, standard and registry for the description, discovery, and integration of any business over the Internet.

UDDI was jointly launched by Ariba, IBM, and Microsoft, with support from other technology firms like Compaq, Dell, and Sun Microsystems. It allows

any company to list an easily accessible description of its contact, product, and service information, as well as its preferred E-Commerce operating processes. The standard allows businesses to more easily find and conduct transactions with each other regardless of the software and hardware they use (Raisch, 2001).

2.7 Some B2B Adoption Problems in Developing Countries

Considering the huge benefits derivable from the adoption of E-Commerce technology, it is disappointing that most developing countries, particularly those in SSA, are still experiencing some very difficult adoption bottlenecks which deny them the benefits from this type of commerce.

Rao (2003) while investigating the criteria for assessing national e-readiness in developing countries identified what he calls the "8Cs" checklist. This list, comprising 'Connectivity', 'Content', 'Community', 'Commerce', 'Capacity', 'Culture', 'Co-operation' and 'Capital'. Beyond semantics, most of the identified problems confronting B2B in SSA are similar to the ones in the checklist.

In a study conducted amongst SMEs in rural eastern Kentucky (USA), Wymer and Regan (2004) observed that the major factor stopping small businesses in implementing B2B E-Commerce "is the cost and availability of resources and capital to invest in it". This is similar to the situation in most developing countries (Shemi and Magembe, 2003). Other studies have identified such problems as those relating to Personal Computer (PC) penetration, infrastructure, economic/political/business issues, culture and marketing issues (Fleenor and Raven, 2003). Barriers as legislation, payment methods and financial resources as well as a relative lack of government interest in E-Commerce also exist (UNCTAD, 2001).

PC penetration is arguably the prime indicator of readiness for E-Business particularly B2C. As Rabe (2001) and Singh et al. (2001) observed, there is a direct relationship between PC penetration and E-Commerce. It is

encouraging to note that the number of Internet users in these developing countries has continued to increase (Sherif, 2002).

Okunoye and Karsten (2003) observed that the problem with the IT infrastructure is more pronounced in SSA than in India where the government has invested heavily in IT. Most of the problems in SSA can be attributed to the government's lack of preparedness to commit sufficient resources to develop the national infrastructure, which could as a consequence improve the organisational infrastructures. Closely related to the issue of Internet users is also the low diffusion of computers and telecommunications in desolate regions of SSA as identified by Avgerou (2002). For any meaningful progress to take place in the region therefore, this issue has to be reversed.

There is also the need to create a network system which can overcome the traditional topographical difficulties created by the nature of the African terrains. We postulate that wireless broadband applications (such as DakNet) should be adapted and deployed. Sherif (2002) observed that the number of Internet users in SSA is increasing. This view is also supported by various ITU reports (see ITU, 2002, 2003 and 2004; WEF, 2008). In order therefore to help SMEs in SSA, there is the need to address both the 'Capital' and 'Co-operation' issues affecting them (Wymer and Regan, 2004; Rao, 2003). Shemi & Magembe (2003) also made the point when they called for a new model of E-Commerce that emphasises strategic alliance and collaboration amongst SMEs in Africa as existing models "favour large businesses that have the necessary resources". It is partly to address these issues that we propose a new model of B2B E-Commerce. This model will be primarily aimed at helping the SMEs which lack the capital to deploy these technologies on their own. The model would help them to pool their resources together (Capital and Co-operation in Rao's list) in order to exploit the global market, and to help them maximise the benefits of emerging technologies.

In studying and researching the economic self-sustainability of the Internet in rural areas, Pentland et al. (2004) identified 6 broad categories - criteria - for

success (something of a "Laundry List"). These include costs, revenue, networks, business models, policy, and capacity. These categories are not clearly defined due largely to the interrelationship and interdependence among them, which make consideration of any one category ineffective. For instance, Policy will affect Cost, which in turn influences Business Models and therefore Revenue and so on. In short, every category affects one or more others

Pentland et al., (2004) identify one important assumption underlying many issues in the effort to achieve self-sustainable Internet service as "in a poor rural setting, the Internet is likely for some time to be delivered as a community resource, rather than a personal one". In other words, rather than each individual having a network-enabled digital appliance for themselves, each village or community might have shared resources that are financially sustained through some combination of user fees and outside revenue. This basic model is often realised through some form of community access point (CAP) for information and communications services.

CAPs (also known as Community Telecentres or Telekiosks) in the developing world have, thus far, been primarily sponsored and undertaken by governments, multilateral institutions, and non-profit organisations. Pentland et al. (2004) while agreeing that access to ICTs is important and that it can, and should be supported by the international development community, suggest however that collective support for it should come in new forms that focus more on enabling others, rather than on sustaining them. They also suggest that the private sector (from large corporations to grass roots entrepreneurs) has the most significant role in creating and broadening effective use of ICT.

There is a convergence of interests around the need for sustainable rural ICT among stakeholders (policy makers, the private sector, international development community, and others) as well as an agreement that the fastest and most efficient way of including rural communities of the developing

nations in the networked world is through the market approach driven by the private sector and entrepreneurs (a private sector-driven market approach). This gave rise to the idea of using the SMEs for this project.

As Davies et al. (2001) observed, with today's technologies, a village in India can be brought online and provisioned with Internet, telephone service, a computer, and so on, for under US$1,000 in capital costs and with ongoing recurrent costs approaching US$60.00 per month.

2.8 Communication Accessibility

2.8.1 Wireless Telecommunications and their Benefits to SMEs

In 1997, the IEEE (Institute of Electrical and Electronics Engineers) created the first wireless local area network (WLAN) standard called 802.11. This standard specified a 2.4GHz operating frequency with data rates of 1 and 2Mbps. This limitation in the bandwidth rendered the technology almost obsolete. Subsequently, the 802.11a and 802.11b standards were created. Of this two however, the 802.11b standard became more popular due largely to its advantages over the 802.11a version. Among the advantages are cost-effectiveness, ease of installation and maintenance.

These advances in wireless computer networks have led to huge commercial success and low pricing for broadband networks. While these networks are viewed as mainly for offices or for hotspots in urban areas, they can provide broadband access to even the most remote areas at a low price. Wireless cell phone and wireless local loop (WLL) services cost roughly a third of copper or fibre landline service (Pentland et al., 2004).

Wireless networking technology has a lot of advantages and benefits. It is useful in organizations such as hotels, hospitals, and manufacturing units that have constraints for laying cables. For SMEs, particularly those intending to relocate their premises according to needs, the technology is very relevant as there are no cabling costs involved when relocating the company premises.

Experiments have also shown that the technology is practicable and applicable in mountainous terrains and in city centres (Pentland et al., 2004). Indeed, several cities in America have begun to deploy free Internet connectivity using the IEEE 802.11b. In spite of these advances however, speed of connectivity and the strength of the signals being received can be drastically impaired by the number of walls, floors, and distance from the wireless access point (WAP) or the router (Bowman, 2002).

2.8.2 Security Concerns in Wireless Technologies

In spite of its very many useful applications however, wireless networking has some very important drawbacks. Some of them, as identified by users and system administrators include radio interference from other devices and the issue of security. With the explosive growth of wireless networking, the need for wireless security has been increasing exponentially (Bowman, 2005; Godwin-Jones, 2002).

Data security is a major issue for wireless technology due to the nature of the transmission mechanism (electromagnetic signals passing through the air). It is commonly believed that voice applications are less secure than data applications. This is due to the limited capabilities of existing technologies to protect information that is being transmitted. For example, in metropolitan areas, users are at risk that simple scanning devices can highjack cell phone numbers which can be maliciously used.

Some of the major security problems confronting a wireless network include (but not limited to) insertion attacks, interception and monitoring wireless traffic and jamming. Insertion attacks involve placing unauthorized devices on the wireless network without going through a security process and review. An attacker can also sniff and capture legitimate traffic. However, this type of attack can be minimised through encryption. It is important to understand that in WLANs, data is encrypted only between the wireless adapter and the access point. Data travels through a wired LAN unencrypted. Therefore, data

transmitted by wireless is not more secure than data transmitted through the wire. Application level encryption mechanisms, like secure web transactions Secure Socket Layer (SSL), SSH, etc. are responsible for further protection of data.

Jamming is similar to DoS (Denial of Service) attacks. In this case, a wireless network may be subjected to jamming, where legitimate traffic gets jammed because illegitimate traffic overwhelms the frequencies, making it impossible for timely flow of legitimate traffic. Wi-Fi runs on a radio frequency of 2.4 GHz which is also shared by microwave ovens, most cordless phones, and Bluetooth devices, creating the potential for serious interference problems. These problems are however avoided by the 802.11a standard which runs at 5.4 GHz. Both standards have in-built security protocol call WEP (Wireless Encryption Protocol) which can allow the encryption of the wireless transmissions. Of course, like all telecommunications devices, WEP, warn security experts, is not entirely impenetrable (Godwin-Jones, 2002). It is however recommended that the security systems should be enhanced with the use of VPN (virtual private network) software for secure network access with wireless clients.

2.9 A Comparative Analysis of Some Relevant Technologies

There is a number of communications and technological platforms and applications that can be used for the deployment and implementation of the proposed model. These include wireless and satellite networks as well as VSAT (very small aperture technology). There are also such relevant applications as DakNet and n-Logue networks. However, the choice of the appropriate technology and application depends heavily on the suitability and affordability of such technologies.

2.9.1 Wireless Technologies

The introduction of wireless telecommunications technology has taken Internet connectivity to a new height. The growth in the area of wireless

networks has been tremendous. This has come as a result of the multifarious advantages which these technologies bring. One of the most important of such advantages is the flexibility the technologies can offer to their users. There is also the issue of ease of installation, use and maintenance (Pentland et al., 2004). On top of all that though, at least from the perspective of the small business user, are the relative low costs of extending or reconfiguring already existing networks.

For the countries in the SSA region, the possibility of having unfettered access, irrespective of the difficult and often harsh topographical terrains, makes this kind of technology a *sine qua non* for businesses wishing to explore and exploit the E-Commerce potential.

IEEE 802.11 is divided primarily into three sub-standards, viz. 802.11a, 802.11b, and 802.11g among others. Table 2.1 distinguishes the differences and similarities between these standards and bluetooth. Bluetooth is an alternative wireless network technology that followed a different development path than the 802.11 family of standards.

Table 2.1: Comparing Wireless LAN Standards Technologies

802.11 Wireless LAN Standards Comparison				
Features	802.11a	802.11b	802.11g	Bluetooth
Data Rate (Mbps)	54	11	54	721Kbps 56Kbps
Operating Frequency (GHz)	5	2.4	2.4	2.4
Typical power output (mw)	40-800	100	100	100
Compatibility	Not compatible with 802.11b or 802.11g	Not compatible with 802.11a or 802.11g	Compatible with 802.11b	Not compatible with 802.11a/b.
Range	150feet	150feet	150feet	30feet
Interference risk	Low	High	High	High
Price	Expensive	Cheap	Moderate	Moderate
Hot-spot access	Poor	Good	Good	Poor

Though 802.11a and 802.11b standards have been developed around the same time, 802.11b has become more popular due to affordability of the hardware for small business and home networking. However, considering any future expansion, it is desirable to buy equipment that is capable of operating in dual modes (802.11 a/b). Bluetooth supports a very short range (approximately 10 meters) and relatively low bandwidth (1 Mbps). In practice, Bluetooth technology is more applicable to PDAs and cell phones than with PCs and general-purpose Wireless LAN networking.

There is also another emerging wireless standard which looks equally promising. It is known as HiperLAN2. This technology is developed by Nokia and Ericsson and is approved by the European Telecommunication Standardization Institute (ETSI). It shares a lot of similarities with the IEEE 802.11a standard like data rate (54 Mbps) and operating frequency (5.4 GHz). It however, has some remarkable differences with the existing technology. One being that it is not compatible with, 802.11a standard. Furthermore, while 802.11a is primarily a data-delivery protocol, HiperLAN2 offers built-in support for voice and video and also allows for QoS (quality of service) transmissions (Godwin-Jones, 2002). HiperLAN2 also provides for unicast, multicast, and broadcast transmissions. Most experts see it as the most advanced wireless standard currently available. There is still not enough information regarding its suitability in the extreme weather conditions in SSA and its affordability by small businesses in the region.

2.9.2 Satellite Networks

Satellite-based wireless networks have a lot of advantages. They are characterised by very wide-spread, often global, coverage. However, they are also characterised with limited voice and data quality to very wide ranging locations (Beaubrun and Pierre, 2001). This limitation has resulted in often poor coverage and reception to systems being used inside buildings or locations shadowed by buildings, trees and mountainous terrains. Consequently, in a densely populated area, the satellite-based networks do not favourably compete with terrestrial wireless systems. In low-density

populations however, the networks can complement terrestrial wireless systems.

2.10 Some Relevant Wireless Network Applications

2.10.1 DakNet Technology

In the course of the search for literature, this researcher got to know that one of the best technological platforms for businesses and indeed, communities in the developing countries is the wireless, broadband telecommunications (Best & Maclay, 2002; UNCTAD, 2002; Pentland et al., 2004). This form of communication also becomes more imperative given that the prohibitive costs associated with legacy Public Switched Telephony Networks (PSTNs) are often beyond the reach of some business operators (particularly, SMEs) in the developing countries (Liddell, 2003). Furthermore, there have been numerous recommendations for the adoption of the IEEE 802.11 standard, known as the Wireless Fidelity (WiFi) model (see for instance, Pentland et al., 2004). Experiments have also shown that the technology is practicable and applicable in mountainous terrains and in city centres. Indeed, several cities in America have begun to deploy free Internet connectivity using the IEEE 802.11 standard technology.

There is a myriad of wireless applications in use throughout the world today. One of the most contemporary efforts at making the wireless communications applicable is the DakNet project. According to Pentland et al. (2004), DakNet (Fig 2.5), which is an ad-hoc network that uses wireless technology to provide asynchronous digital connectivity (ADC), provides evidence that the marriage of wireless and asynchronous service may indeed be the elusive kernel that leads to universal broadband connectivity.

The DakNet network takes advantage of the existing communications and transportation infrastructure to distribute digital connectivity to remote, outlying villages lacking a digital communications infrastructure. The name 'DakNet' is derived from the Hindi word meaning "post" or "postal". It combines a physical means of transportation with wireless data transfer to extend the

Internet connectivity that a central uplink or hub, such as a cybercafe, VSAT system or post office provides.

It transmits data over short point-to-point links between kiosks and portable storage devices, called mobile access points (MAPs). A MAP is physically mounted on and powered by a bus, a motorcycle, or even a bicycle with a small generator or cattle. As this movable objects move into the interiors, the MAPs they carry physically transport data among public kiosks and private communications devices (like Intranets) and between kiosks and a hub (for non-real-time Internet access). Low-cost WiFi radio transceivers automatically transfer the data stored in the MAPs at high bandwidth for each point-to-point connection.

Some villages in both India and northern Cambodia are already enjoying the benefits of this technology with good results. The Cambodian project which took off in September 2003 using the DakNet technology provided wireless connectivity for 15 solar-powered village schools, telemedicine clinics, and a governor's office.
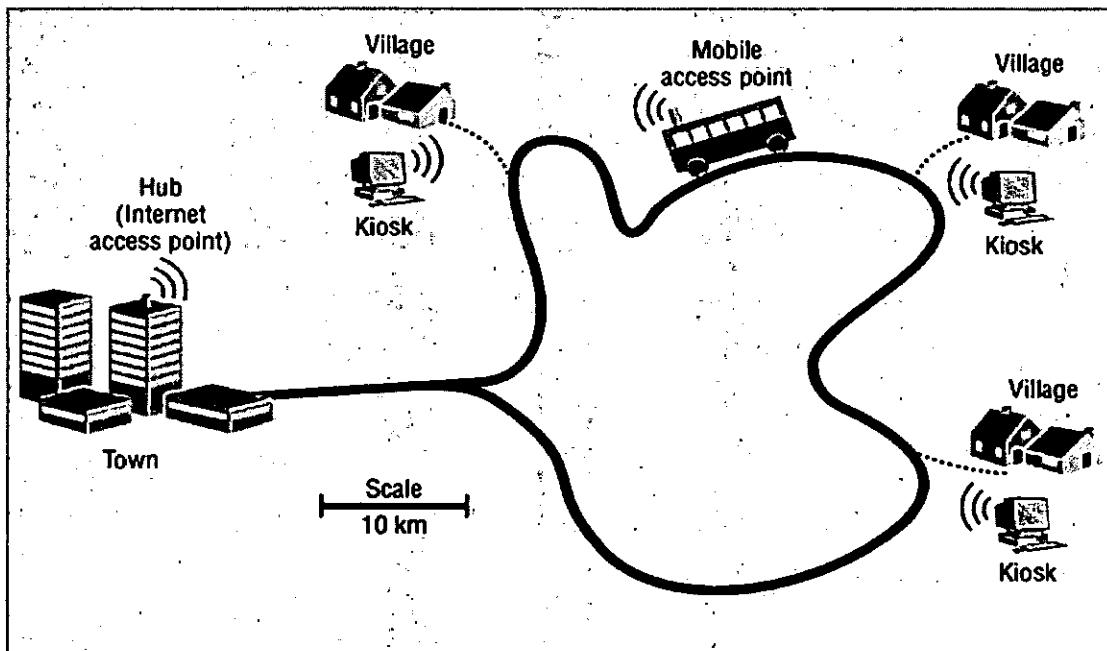
Fig 2.5: DakNet network concept (Pentland et al., 2004).

This technology was originally conceived, developed and patented at Massachusetts Institute of Technology (MIT) in collaboration with First Mile Solutions. It is an exportable solution for the 'first mile' with a low-cost wireless network that is easy to set up and maintain. Its deployment in some Asian and Latin American countries which share a high level of topographical similarities with the sub-Sahara African region shows that it is also workable in SSA.

In spite of the novelty of using even cattle mounted with MAPs to make connectivity possible in remote areas, the DakNet technology has a major drawback in that it is not a 24-hour connectivity system. As Pentland et al. (2004) observed, DakNet is an ad-hoc network that uses wireless technology to bring asynchronous digital connectivity. It is a store-and-forward system which makes all-round connectivity very difficult. Furthermore, the uncertainties surrounding the MAP-carrying movable objects are too heavy a price to pay. Suppose, for instance, the vehicle breaks down (through an accident or sabotage, etc), what happens to those who are already transacting businesses online? In the same vein, what would happen if the cattle carrying the MAPs hit the gadgets against a tree or if the cattle go into a pond? Besides, how should the MAPs being carried by the cattle be powered to guarantee continuity? The list goes on.

2.10.2 n-Logue Technology
There is also the n-Logue communications network which uses the CorDECT technology. CorDECT, like the DakNet, is an advanced Wireless Access system designed keeping the economic realities of a country like India in mind. It has been developed by Midas Communication Technologies and Indian Institute of Technology (IIT), Madras, in association with Analog Devices, USA.

The technology also provides a complete wireless access solution with seamless integration of both voice and Internet services, providing simultaneous toll-quality voice and 35 / 70 kbps Internet access to wireless subscribers. CorDECT is based on the DECT air interface standard

68

specification from the European Telecommunication Standards Institute (ETSI). Developed as an alternative to the telephone, it is faster, more reliable and provides simultaneous voice and Internet connectivity.

The primary effort of this researcher was to explore the possibility of using the DakNet model platform for this project. Unfortunately however, this effort failed due largely to some administrative hurdles put in place by the management of First Mile Solutions. The good news however is that, beyond the DakNet and corDect wireless applications, there are others which can still be used for the implementation and deployment of the proposed B2B model. The only conditions are that the selected technological platform must be such that can enhance connectivity (accessibility) while at the same time, being cost-effective, easy to use and maintain, with in-built security and stability, and, perhaps most importantly, being resistant to extreme weather conditions prevalent in the SSA regions.

2.11 B2B Architecture

Bhaskaran et al. (2001) looked into the architecture, design and implementation of an application platform for B2B E-Commerce that addresses the need for dynamic E-Business services which assimilate e-markets in the context of collaborative commerce driven by business processes.

Any non-trivial B2B E-Commerce solution, according to the researchers, should pose a large number of architecture, design, implementation and integration challenges. They propose five key requirements for such a solution as: a) Integrated User Experience; b) Common Security Mechanism; c) Business Process Integration (BPI); d)Common Messaging Infrastructure; and e) Solution Management and Monitoring.

According to Bhaskaran et al. (2001), five frameworks make up the E-Commerce architecture (see Fig 2.6). These frameworks also make up the constituents of the B2B E-Commerce platform.

- The Interaction Manager framework provides the integrated user experience.
- The Business Flow Manager framework delivers business process integration and brokering capabilities.
- The Trust and Access framework ensures common security mechanisms.
- The Application Integration framework presents a common messaging infrastructure; while
- The Solution Management framework supports solution management and monitoring.
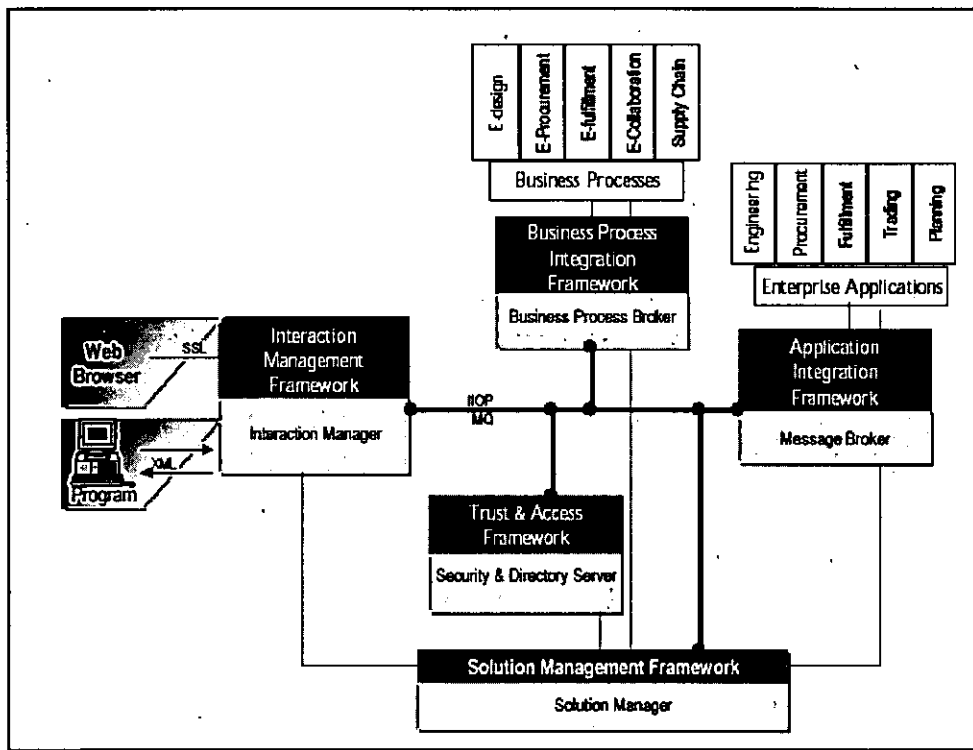
Fig 2.6: Architecture Overview (Bhaskaran et al., 2001)

As robust as this architecture appears however, the mere fact that it does not provide room for a multi-user integration makes it almost irrelevant to the SMEs in SSA. This is because the cost of implementing this framework is so

prohibitive that it becomes unaffordable to those businesses for which this project seeks to help. Furthermore, the framework is too complex for small businesses to implement. Besides, due largely to the issues of cost and bureaucracy, most SMEs in SSA (and indeed, in any other part of the developed world for that matter) can not easily implement this kind of technology. This means therefore that only big companies can boast the wherewithal to deploy the technology.

There is growing realisation in business circles that the aggregation and collaboration value from e-markets can only be achieved if the commerce relationship transcends simple exchange of messages and transactions between enterprises to include collaborative supply chain business processes.

2.12 Towards the Proposed Model

The Internet is replete with variations of classifications and taxonomies of business models derived from the kinds of business activities the technologies support. There is, for instance, the typology of business models, known as 'b-webs' propounded by Tapscott et al. (2000). Their models which identify five generic business-webs are classified according to their degree of value integration (ranging from self-organising to hierarchical) and their degree of control (low/high) of the value of creation. There is also the model described by Timmers (1998) that sees a business model as architecture for the product, service and information flows which describes the various business actors and their roles, as well as the potential benefits of these actors. The model also includes a description of the sources of revenue. Other researchers (see for instance Afuah and Tucci, 2001; Amit and Zott, 2001; Gordijn and Akkermans, 2001) have come up with various other models.

There are also the models proposed by Rappa (2004) and Weill et al. (2005). These models have been given a more detailed look in Chapter 5. For now however, suffice to say that Rappa proposed nine models while Weill et al.

proposed what they call 16 Business Model Archetypes (BMAs) which are specialised variations of their original four models (see Table 5.1).

It is important to point out that there are some portals targeted at the small business operatives. There are the 'Alibaba' online trading model (see www.alibaba.com) and the 'Novica' model (www.novica.com) both of which provide space for traders to advertise and sell their wares online. The difference between these portals and what we are proposing here lies in the fact that they are 'Intermediary-Oriented' as discussed under 'Identifiable Architectural Models' in 2.1.2. In our model, the SMEs are empowered to take control of the portal and all that goes into it (even though they hire the professionals to bring this about). It is therefore 'Supplier-Oriented' in nature.

There is also the other 'Supplier-Oriented' portal like the Naushad Trading Company (www.ntclimited.com) which, from all intents and purposes, is 'Intermediary-Oriented' since they do not produce the works they sell online. From the available architecture therefore, our proposed model is unique in the sense that it proposes the coming together of a group of small businesses who pool their meagre resources together in order to exploit the global E-Commerce market.

2.13 Summary

From the various issues discussed in this chapter, it is evident that given the special dispositions of the SSA region, and indeed, the developing countries in general, a new E-Commerce model is very important. For one, it will help the small business operatives in these regions to exploit the global benefits of E-Commerce in general and of B2B in particular.

72

CHAPTER THREE

Research Methodology

3.1 Introduction

In this chapter, the research methodology used in the study is described. The study aims to find ways of attracting more SME participation in B2B E-Commerce in the SSA region. It also aims to develop a model framework of B2B E-Commerce that can be more cheaply deployed and implemented by SMEs in developing countries. Such a model/framework would help these SMEs to leverage their E-Commerce potential. In this chapter, we explore some of the philosophical thoughts underpinning the research. We also examine some of the research methods and approaches that are relevant to this study before deciding, on the selection of the most suitable method (or combination of methods) to be used for the study providing justification for adopting or rejecting particular method or approach.

This research has two broad objectives: one is technological and the other is business. The business objective seeks to develop a business model framework which would show how the various business activities would be achieved, while the technological objective deals with the deployment and implementation of the designed business.

3.2 Philosophical and Historical Underpinnings of the Research

> *The choice of an appropriate research method should be determined by a combination of the philosophical position of the researcher vis-à-vis the research objectives, the nature of the problem to be explored, its novelty in research terms, and the time and resources available to carry out the work* (Wilson, 2002).

There are two methodological approaches in the social scientific research namely: quantitative and qualitative (Miller and Brewer, 2003). While they are

not totally seen as being opposing approaches, they do adopt a very different position on the fundamentals of the relationships between ideas and evidence. Every research effort (either quantitative or qualitative) is based upon some basic assumptions which relate to underlying epistemology guiding the research (Gittins, 2001; Myers and Avison, 2002). As has been observed by Bounman (1994), and as reported in Chapter 2 (section 2.2), the wide-spread nature and popularity of the 'Isusu' scheme in SSA demonstrates the willingness of the peoples of that region to share resources and trust one another. This culture of collaborative ventures provides the impetus and underlying assumption for this study.

Epistemology deals with the assumptions about knowledge and how it can be obtained (Hirschheim, 1992). Knowledge in this context is not conditional and relative to both time and place. It is a matter of societal or group acceptance (Siakas, 2001). There is however, no unanimity in respect of the number of these underlying paradigms or epistemologies. A paradigm, from the Greek word *paradigma,* meaning pattern, is a theoretical structure or a framework of thought that acts as a template or example to be followed. It was applied by Thomas Kuhn in his seminal work *The Structure of Scientific Revolutions* (1962) as a set of scientific and metaphysical beliefs that make up a theoretical framework (Miller and Brewer, 2003).

Some researchers like Guba and Lincoln (1985) postulate that there are four underlying paradigms namely: positivism, post-positivism, critical theory and constructivism. Others, including Orlikowski and Baroudi (1991) argue that there are only three (positivist, interpretive and critical). Even so, the issue of whether these paradigms or epistemologies can be accommodated within one study has also been the subject of considerable disagreement within the academic community.

For our discussion, the epistemological categories as enunciated by Orlikowski and Baroudi (1991) form the basis of further exploration. Myers

and Avison (2002) acknowledge that while the three research epistemologies have some philosophical distinctions, these distinctions in practice are not always clear-cut. This has resulted in a situation where there exists considerable disagreement as to whether these paradigms are necessarily opposed to each other. It is pertinent to look at these epistemological categories a little more detailed.

3.3 Research Methods/Approaches Relevant to the Study

As observed Myers and Avison (2002), research methods have various classifications; however one of the most common distinctions is between qualitative and quantitative methods. A lot of factors affect the selection of which particular research approach is appropriate in a given study. Some of these factors include the problem of interest, resources available, the skills and training of the researcher, and the audience for the research.

This research effort sets out to answer some very fundamental questions with respect to how E-Commerce technologies can be better deployed and implemented by SMEs in SSA. These questions include: How the cost of using the Internet for business can be made affordable for the SMEs; how collaboration between SMEs can help them in exploiting the benefits of these emerging technologies; how to engender trust between SMEs participating in this collaborative framework; how the issue of security of the technologies can be enhanced.

With these questions in mind, and in view of the observation made by Miller and Brewer (2003), let us take a look at quantitative and qualitative research methods with a view to selecting which of them (or a combination of both) is more appropriate. It is important to stress here that although some research efforts may incorporate both quantitative and qualitative methodologies, in their 'pure' form there are significant differences in the assumptions underlying these approaches, as well as in the data collection and analysis procedures used.

3.3.1 Quantitative Research Method

This method was originally developed in the natural sciences to study natural phenomena. Research in the quantitative tradition observes Burns (2000), follows a linear sequence (as shown in Fig. 3.1). Quantitative research method involves the numerical measurement of specific aspects of phenomena.
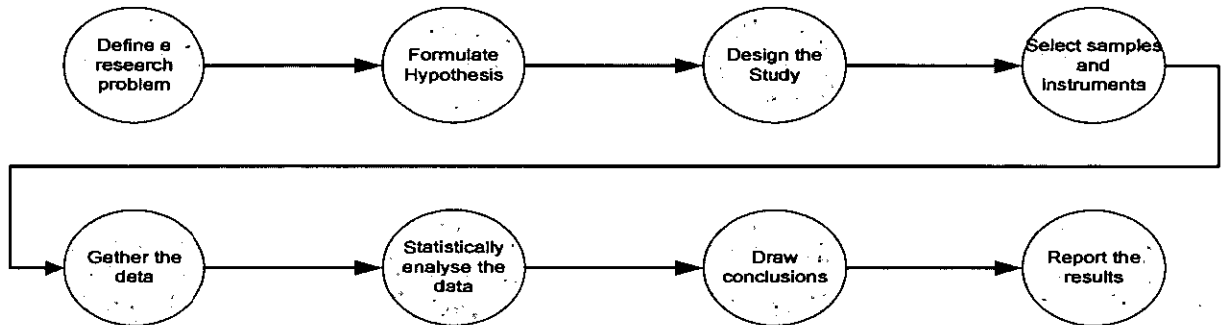
Fig 3.1: Linear Sequence in Quantitative Research (based on Burns, 2000)

It is an investigation into an identified problem. This investigation is based on testing a theory which is composed of variables. These variables can be measured with numbers and analyzed using statistical techniques the overall goal being to determine whether the predictive generalizations of a theory hold true.

Some of the examples of this type of research method which are very popular with social scientists include laboratory experiments, survey methods, formal methods (for example, econometrics) and numerical methods such as mathematical modelling (Myers and Avison, 2002).

As observed by Pinsonneault and Kraemer (1992), some important distinctions exist between surveys and survey research. A survey (like marketing surveys, political survey, vox populi, etc) is all about collecting information about characteristics, trends, actions, or opinions of a large group of people or population. A research survey, on the other hand, is conducted

76

to advance scientific knowledge. Surveys involve cross-sectional and longitudinal studies using questionnaires or interviews for data collection. The intention is usually to estimate the characteristics of a large population of interest using a smaller sample from that population. As Lund (2001) pointed out, the questionnaire is potentially one of the best ways of collecting data from a large portion of a group. We are therefore using the questionnaire for the collection of our data.

3.3.2 Qualitative Research Method

There is a very strong argument pointing to the fact that there is no single, accepted way of doing qualitative research (Ritchie and Lewis, 2003). In other words, how a particular research is conducted depends on a whole raft of factors which include but are not limited to the following questions: What are the researchers' beliefs about the nature of the social world and what can be known about it? What is the nature of knowledge and how can it be acquired? What are the purposes and goals of the research? What are the characteristics of the research participants? Who are the target audiences of the research? What do the sponsors of the research (if any) want? And, what is the position and environment of the researchers themselves? Qualitative research is one of the methods which some of these questions can be answered. Among the various qualitative research approaches relevant to this study are ethnography, case study, grounded theory and action research.

i) Ethnography

The word *ethnography,* observes Burns (2000), means 'writing about people'. This is a form of research focusing on the sociology of meaning through close field observation of socio-cultural phenomena. It is the research method of Social and Cultural Anthropology in which the ethnographer typically focuses on a community (not necessarily geographic, considering also work, leisure, and other·communities), selecting informants who are known to have an overview of the activities of the community (Myers and Avison, 2002; Lewis, 1985). Such informants are interviewed multiple times, using information from

previous informants to elicit clarification and deeper responses upon re-interview. This process is intended to reveal common cultural understandings related to the phenomena under study.

This will not be used for this study for many reasons. One of them is the fact that the problems of time and linguistic differences/barriers can introduce a lot of noise/distortion in the data generated from this method. There is also the problem created by the fact that no hypothesis is being tested in ethnographic investigation (Sharp et al., 1999). Furthermore, it will be logistically a huge mountain to climb given that, to make informed meaning out of the exercise, a lot of time, money and effort must be invested into the exercise. These are very scarce commodities to this researcher.

ii) Case Study

There is also the case for the Case Study method. Case Study is one of the most frequently used research methods in information systems research.

Critics of this method however believe that the study of a small number of cases can offer no grounds for establishing reliability or generality of findings. Another drawback of the case study method is that the intense exposure of the researcher sometimes introduces biases in the findings. Some dismiss case study research as useful only as an exploratory tool. It is on this basis that this method will not be used, notwithstanding the arguments as made by Hamel et al. (1993) and Yin (1984, 1989).

iii) Grounded Theory

Grounded Theory is developed inductively from a corpus of data acquired by a participant-observer. This is a specific research technique that enables the disciplined extraction of a theory-based description of behaviour, based on

78

empirical observations (Clarke, 2000; Glaser & Strauss, 1997; Strauss & Corbin, 1990; and Myers, 1997).

Critics of this method however point to the fact that it is not easy to apply and that most people invoke it as an approach without following its demanding strictures. Besides, it is regarded as a method for which there is as yet no detailed epistemology. This has resulted in a situation where this method tends to be used in many varied and applied fields with varying degrees of sophistication (Miller & Brewer, 2003). It is for these reasons that Grounded Theory will not be used in this study.

3.4 The Selected Research Method

Quantitative research method assumes positivism, while qualitative method makes non-positivistic assumptions. The importance of adopting qualitative research methods in social sciences in general and IS research in particular has been advocated by a number of researchers. Myers and Avison, (2002), for example, argue that in some respects, the qualitative research method may be regarded as more creative than the quantitative research method. Their argument is that research into complex issues covering 'why', 'how', and 'who', simple survey techniques are not appropriate and more sophisticated research strategies should be used. This research is in the domain of E-Commerce which, according to Clarke (2000) also falls within various disciplines, importantly including the discipline of information systems (IS).

This study is multi-faceted in nature and therefore requires a combination of research approaches. The primary research method to be used is qualitative and exploratory. This is because it is necessary to identify the various factors militating against the development of a robust B2B E-Commerce in Africa and fashion the best way to overcome these obstacles. To do this, the opinions of some of the key players in the African sub continent will have to be sought since they are the people directly involved in the business. One of the best ways to elicit this kind of information is through the use of questionnaire (Miles and Huberman, 1984; Cornford and Smithson, 1966).

Furthermore, as McNamara (1999) advocated, a combination of methods, for example, a questionnaire to quickly collect a great deal of information from a lot of people, and then structured interviews to get more in-depth information from certain respondents to the questionnaire, was used. This combination of research methods becomes even more imperative given the characteristics of the E-Commerce domain as identified by Clarke (2000). These are:

- its recent emergence (c. 1988-1993, depending on the definition adopted);

- the rapid change that has always characterised the domain;

- the very substantial variation in behaviour in apparently similar contexts; and

- the enormous amount of attention paid to it by the populist media and marketing interests, with the inevitable distortion of terminology and data that this engenders.

The survey method (with the "empirical materials" being generated mainly by administering the questionnaire to the respondents) will be used for capturing the data from the population. This is intended to throw more light on the people and the social and cultural contexts within which they work (Myers, 1997). There is also the need to acquire a deeper understanding of how the various issues affecting the adoption of this form of commerce impact on the organisations adopting it. To achieve this therefore, a qualitative investigation of the activities of some of the organisations used in this study would be conducted by way of follow-up structured interviews. These would help in throwing more light on some areas where some detailed information will be required and which might not have been properly dealt with by the questionnaire.

3.5 Research Design and Techniques

3.5.1 Research Questions

The format adopted and stages covered in any research endeavour are dependent upon the research objectives and questions. This research work sets out to answer the main question contained in Chapter 1 (Section 1.3) - *What effects will adopting a collaborative E-Business framework have on the level of SME participation in E-Commerce in SSA?*

The project will also find answers to the following four sub-questions:

a. What effects will a reduction in the cost of conducting Electronic Business have on the level of SME participation in Electronic Commerce in SSA?

b. What effects will an increase in the trust level of conducting Electronic Business have on the level of SME participation in Electronic Commerce in SSA?

c. What effects will an increase in the level of security of Electronic Business have on the level of SME participation in Electronic Commerce in SSA?

d. What effects does culture have on the level of SME participation in Electronic Commerce in SSA?

3.5.2 Hypothesis Formulation

To answer these questions and some other relevant questions, we have formulated five corresponding hypotheses. These are:

1. H_1: Reduction in the cost of conducting Electronic Business will have a significant increase on the level of SME participation in E-Commerce in SSA (at the significance level of $\alpha < .05$).

2. H_2: An increase in the level of trust in Electronic Business will result in an increase in the level of SME participation in E-Commerce in SSA.

3. H_3: An increase in the level of security on Electronic Business will result in an increase in the level of SME participation in E-Commerce in SSA.

4. H_4: Existing Culture will help in increasing the level of SME participation in E-Commerce in SSA.

5. H_5: Adopting a Collaborative Electronic Business framework will result in an increase in the level of SME participation in E-Commerce in SSA.

3.5.3 Data Generation

To answer these research questions, we would stagger our activities into four stages (or phases). The first stage involves conducting a pilot study in Nigeria following an extensive literature search and review. The Pilot Study would cover five selected sectors of the Nigerian economy. One of the aims of the study will be to validate and test the ability of the instrument of data collection (Questionnaire) in addressing the research questions and in generating appropriate data for the study. The analysis of the data generated from the Pilot Study would help in modifying and refining the questionnaire and in identifying some other areas of interest for further investigation. It will also help in identifying specific areas to form the focus of the overall research objectives.

In line with the advice of Barbour et al. (2000), the findings of the Pilot Study would be used in developing a few questions and probes that would stimulate discussion about the key research topics. Furthermore, as Okoli's (2003) observation indicated, it is our expectation that the feedback to be received from some of the respondents (particularly those in the academia) would be of high quality and would help in the validation of the instrument to be used for data capturing.

After the analysis of the data generated during the pilot study stage, the questionnaire would be redesigned. This will be preparatory to the second phase of the study which entails conducting a major field study among some of the respondents identified in the Pilot Study. The Field Study would be targeted to the specific SME groups relevant to the study (as discussed in 2.5.1 of Chapter 2). Furthermore, the Interview method would also be used in

82

throwing more light into the primary data generated through the Questionnaire whenever the need arises.

Table 3.1: Summary of Research Phases and their Outcomes (adapted from Siakas, 2001)

	Phase 1	Phase II	Phase III	Phase IV
Objectives	- Literature Review - PhD Registration - Design Questionnaire - Prepare for Pilot Study	- Pilot Study - Analysis - Modify Questionnaire - Conference - PhD Transfer - Prepare for Main Field Study	- Conduct Main Field Study - Analyse Data - Interpret Results - Design Model	- Validation of the designed model; - Writing of the Thesis - Submission of Thesis
Research Methods	-	- Field Study - Survey - Interview	- Field Study - Survey - Interview - Statistical Analysis	- Field Study - Statistical Analysis
Research Instrument	-	- Questionnaire - Structured/Semi Structured Interview	- Questionnaire - Structured/Semi Structured Interview	- Questionnaire - Structured Questions - Interviews
Participants	-	- SMEs - Academics - Government Officials	- SMEs - Academics - Government Officials	- Some SMEs - Government officials - Academics
Outcome	- Write up Literature Chapter - Questionnaire Modified/Updated	- Questionnaire Modified - More Concrete Ideas about the Model - Ready for Main Field Study	- Model Designed - Model Evaluated - Ready for Model Validation	- Model Validation - Thesis Submission

The third phase (as shown in Table 3.1) deals with using the data generated from the first and second phases, as well as other sources like the literature search, in designing both the new business and the technological models. It is pertinent to add here that the data generated from the Field Study would be used in answering the Research Questions. The data also would be used in determining how the issues of Cost, Trust, Security and Culture affect the level of E-Commerce participation by SMEs in SSA. This investigation and the subsequent analysis would help in finding out how each of the variables could be enhanced by the designed model.

It is important to point out that the original research strategy included, among other things, to conduct studies involving the developers and the users of the

DakNet technology and how this technology could help SMEs in SSA in embracing E-Commerce in their businesses. In fact, a lot of work had been put into the implementation of this research path. These included extensive literature search, identifying and making contact with the respondents, designing questionnaires for each of the three groups (DakNet developers, DakNet users and SMEs in SSA). Unfortunately, however, this research strategy had to be changed following the apparent lack of commitment and interest from the developers of the DakNet technology based in the United States of America (USA) which resulted in a deadlock in communication.

3.5.4 Questionnaire Design

The instrument to be used in data collection is the questionnaire. The questionnaire (Appendix 1.4) contained 25 questions spread across three sections (A, B, and C). Section A dealt with demographic data (ie data on personal details of the respondents). Section B dwelt on 'firmographic' data, like the profiles of the respondents' businesses or companies. The third section was designed to capture data dealing with the respondents' use of the Internet, and particularly B2B E-Commerce in conducting their businesses.

Due largely to the intricate nature of the issues involved in this investigation, a four-point Likert-style scale of questionnaire design would be used for most of the key issues being investigated. This is intended to give options to the respondents on the levels of 'acceptability' or 'rejection' of the ideas being explored using a four-point semantic differential scale. The responses ranged from 'Very Strong' to 'Very Weak' (or similar expressions). There was no room for such neutral options as 'Don't Know' or 'Unknown' as they tended to provide some kind of cheap 'escape routes' to some respondents who would prefer to sit on the fence.

The lowest response on the scale would be scored 'one' for 'Very Weak' which indicated negative response; while the highest response scored 'four' for 'Very Strong' indicating very positive response. The scores for each of the variables are summed up to give an indication of its measurement.

84

Furthermore, in order to avoid 'acquiescence response sets' (Ramirez, 2005; Ping, 2005), and to increase the reliability and validity of the data collection instrument, the response sets in some of the questions would be reversed starting with 'Very Strongly Disagree' and ending with 'Very Strongly Agree'. Some of the questions would also be negatively structured thereby eliciting different sets of answers from the respondents.

Two statistical methods of analysis would be used in answering the research questions from the Questionnaire. The Descriptive Statistical Method would be used in obtaining the means, response percentages and standard deviations in order to compare these values with each other. We also plan to use the Inferential Statistical Method which would add validity to the descriptive statistical findings. Through this method, we would conduct some statistical tests of the hypotheses using such nonparametric technique as Wilcoxon t-test in calculating the p value of the research questions to measure them against the significance level of 0.05.

3.5.5 Sample Selection Procedure

Since most of the SMEs to be used for the Field Sudy are local craftsmen and women, selecting the samples would be randomly done. This means that SMEs that meet the criteria for selection will be chosen from the three cities of Abuja, Lagos and Enugu. Among the criteria to be considered in selecting the respondents are:

a) level of literacy – (each of the entrepreneurs must have basic literacy);

b) ease of accessibility – (the participating SMEs must be reachable by electronic means);

c) availability of organised business structure – (their business operations must be organised and structured); and

d) documented administration processes – (their business processes and procedures must be documented).

85

3.5.6 **Administering the Questionnaires**

The Questionnaires for the Field Study would be administered to the respondents through the Internet; by email and conventional post; by hand delivery; and through the telephone and fax.

3.5.7 **Conducting Follow-up Interviews**

Both structured and semi-structured interview methods would be used in obtaining some in-depth information from some of the respondents. As argued by Denscombe (2003), interviews are very important in a study of this nature as they help to elicit in-depth and valuable information from the respondents. Questionnaires, as important as they are, can not always accommodate very detailed answers as much as Interviews. One major drawback of the Interview method, especially recorded interview, however is that transcription consumes a lot of time and, in most cases, it is costly. This means therefore that the Interview method would be used very sparingly.

3.6 **Testing the Hypotheses**

As has been stated in Chapter One (section 1.4), five Hypotheses were formulated for this research project. The first four of them would be tested using the data generated from the Field Study, while the fifth one would be tested using the data derived from the Validation exercise.

3.7 **Validating the Designed Model**

The fourth phase of the research deals with the Validation of the designed technological Model. Two stakeholder groups, the Experts and the SMEs, would be used in validating the Model. The Validation exercise would be conducted by designing and administering questionnaires to the selected groups. The Experts would be concerned with the workability of the Model, while the SMEs would assess the ability of the Model to attract more small business participation in E-Commerce. Since the two groups are playing different roles in the Validation exercise, two different questionnaires would be

86

administered through the electronic mail (email). The data to be generated from such exercise would be subjected to rigorous statistical analyses using the SPSS (version 15) software. These analyses would be done separately after which conclusions would be drawn.

The Chi-square (measuring the goodness of fit) statistical technique would be used in answering the fifth Research Question: "What effect will adopting a Collective Electronic Business Model have on the level of SME participation in E-Commerce in SSA?" The results would be used in determining what the groups think about the ability of the model in answering the question. The designed Model would be regarded as being validated if the P value of the statistical calculations measure up to or less than the significance level of 0.05 for each of the two groups

3.8 **Summary**

In this chapter, we have looked at the various research approaches which could have been used in conducting this research. Given that the investigation is multi-faceted, we opted for a combination of research approaches – Qualitative and Quantitative. The Survey method using the questionnaire in data generation would be adopted. The data obtained would however be subjected to quantitative analyses. Then the results obtained would be used in answering the Research Questions (1 to 4). The fifth Question would be answered through the Validation of the designed Model using two stake-holder groups – the Experts and the SMEs. All these steps are covered in Table 3.1.

CHAPTER FOUR

Data Presentation and Analysis

4.1 Preamble

The analyses contained in this chapter are based on the data collected from the Field Study conducted in 2006. As shown in the Field Study Report (Appendix 1.1), the data generated for this research were captured from three Nigerian cities of Abuja, Lagos and Enugu. A total of 122 respondents, comprising arts/crafts people, teachers and administrators, are used for these analyses.

4.2 Some Demographic Data used in the Study

Before delving into the core data generated for this study, it is pertinent to look at the distribution of the demographic information contained in the study. Table 4.0(a) shows that of the 122 respondents used, 113 are male. The predominant age group (c) is the 36-45 (36.9%) group followed by the 46–55 (29.5%) and the 26-35 (27%) groups.

Of the three cities used (b), more than half of the respondents (51.6%) are based in Lagos, with Abuja and Enugu accounting for 28.7% and 19.7% respectively. Some 'firmographic' information in the table (Table 4.0: 'e', 'f' and 'g') shows that an overwhelming majority (63%) of the firms used in the study are small organizations (those employing between 10 and 49 workers each), while micro business participation accounts for 30% of the firms used. Also noteworthy is the fact that 71% of the businesses are sole traders, while those in partnership account for 21% of the respondents.

Table 4.0: Some Demographic Data Distributions

(a) Respondent's Gender		
Gender	Frequency	Percent
Male	113	92.6
Female	9	7.4
Total	122	100.0

(b) Respondent's City of Location		
City	Frequency	Percent
Abuja	35	28.7
Lagos	63	51.6
Enugu	24	19.7
Total	122	100.0

(c) Respondent's Age		
Age	Frequency	Percent
18 – 25	5	4.1
26 – 35	33	27.0
36 – 45	45	36.9
46 - 55	36	29.5
56 & Over	3	2.5
Total	122	100.0

(d) Respondent's Educational Qualification		
Qualification	Frequency	Percent
GCSE	35	28.7
OND/NCE/HND	45	36.9
BA/BSc	25	20.5
MA/MSc	15	12.3
PhD	2	1.6
Total	122	100.0

(e) Company Category		
Company Category	Frequency	Percent
Limited Liability	9	7.4
Partnership	26	21.3
Sole Trader	87	71.3
Total	122	100.0

(f) Craft Type Engaged in		
Arts/Craft Type	Frequency	Percent
Sculpture	59	48.4
Furniture	9	7.4
Pottery	6	4.9
Textiles	11	9.0
Painting	37	30.3
Total	122	100.0

(g) Number of Employees		
Employees	Frequency	Percent
Micro (0-9)	37	30.3
Small (10-49)	77	63.1
Medium (50 & Over)	8	6.6
Total	122	100.0

4.3 Observations from the Data

The first observation to be made while looking at the data is that the level of Internet use by small businesses in the region is still very low. As can be seen in Table 4.1, most of the respondents (90%) use the Internet purely for Email purposes. This activity of course cannot be regarded as core B2B activity in the sense of conducting business as it entails mere communication between businesses or individuals (just like making telephone calls).

However, when 'more serious' uses of the Internet in conducting business transactions are explored, the result appears dramatically different. This is evidenced by further analysis of the table which shows that only a negligible few of the respondents use the Internet for Conducting Sales (6%); Processing Orders from Customers (3%); Delivering Services to Clients (3%); Buying from or Making Payments to Suppliers (7%); and After Sales Support (7%). Furthermore, a greater majority of the respondents do not find using the Internet for "Debt Management" functions very attractive as only 8% of them do so. There are strong indications however that a reasonable number of them interact with their Suppliers for Procuring raw materials (24%) and for Placing Adverts/Publicity and Promotion materials online (26%).

Spurred by the finding that fewer numbers of small businesses use the Internet to 'Conduct Sales' than those who use it to send and receive 'Emails', the researcher sought to explore some of the reasons that brought about this state of affairs.

Table 4.1: Frequency Distribution of Respondents' Internet Use (in Percentages)

Internet Activity	Response (%)
Use Email for Business	90
Procuring raw materials	24
Processing Orders from Customers	3
Buying or Making Payments to Suppliers	7
Placing Adverts/Publicity/Promotions	26
Conducting Sales	6
Delivering Services to Clients	3
Human Resources Management	-
After Sales Support	7
Debt Management	8
All Aspects of my Business	-

4.4 Questionnaire Administration

As contained in the Pilot Study Technical Report (Appendix 1.2), the questionnaires for the main field study were administered using the Internet

(Email and the Web), by Conventional Post, by Hand (face to face method) and Telephone.

4.4.1 Using the Internet

A copy of the questionnaire was posted on the Internet at http://www.cs.mdx.ac.uk/research/PhDArea/research_students/Dili/letter.html. The Web address was publicised and given to those respondents who preferred such medium. The questionnaire published online was designed in such a manner that it could be completed online, saved and sent back to the database created for this purpose. The respondents also had the additional option of saving the document (which was in Word format) and either attaching it to an e-mail or sending it back to the database.

4.4.2 Using Email and Conventional Post

The email facility was also used in sending and receiving questionnaires from respondents. This took the form of word document attached to the email sent to the respondents. On completion of the questionnaires, they either saved the documents and sent them back to the researcher as attachments or they printed and mailed them to the postal addresses that were provided throughout the duration of the Field Study. Some of the questionnaires were administered using the postal services. This method took a few of the questionnaires as our experience during the Pilot Study showed that, for example, only 12% of the 75 questionnaires administered in Abuja through this method were returned (see Appendix 1.2).

4.4.3 By Hand

Again, based on the experience and insights gained during the Pilot Study stage, we used the face-to-face approach as against the postal method in administering the bulk of the questionnaires. The change in approach also became necessary as a way to improve the level of validity of the received questionnaires because a lot of the questionnaires received by post during the

Pilot Study exercise had a high level of casualties. The Pilot Study conducted in Abuja for instance, showed that of the 9 questionnaires received by post, a total of 5 (or 56%) were invalid. Conversely, all the 8 received questionnaires administered by face-to-face method in the same city were valid. In order therefore to reduce the high level of casualty affecting questionnaires administered by post, more questionnaires needed to be administered using face-to-face approach. This, unfortunately, meant that fewer numbers of the questionnaire were administered.

Table 4.2: Questionnaire Distribution

Number Sent	Number Received	Number Valid	Number Invalid	Total Not Used
230	145	122	23	108

A greater number of the questionnaires used in the Field Study were administered by hand while the rest were administered using a combination of delivery methods (such as postal services, email and via the Internet). Of the 230 questionnaires administered, a total of 145 were received. As shown in Table 4.2, 122 out of the 145 received were eventually used for the analysis as the other 23 were found to be invalid due to one thing or the other. The data contained in the 122 questionnaires were used for the analysis.

4.4.4 By Telephone/Fax

Some of the questionnaires were administered using telephone or fax. This simply entails sending the questionnaires to the respondents using the fax system or, in very rare circumstances, reading out the questions and options to the respondents on the telephone and filling in the respondents' answers and choices.

4.5 Variable Constructs and Definitions

In the Pilot Study conducted in 2005 (see Appendix 1.1 for Pilot Study Report), small businesses in Nigeria identified various problems which

militated against their willingness to use the Internet for their business transactions. During the hypothesis formulation, four of these identified factors were selected for further investigation and analysis in the project. These factors are: **COST, TRUST, SECURITY** and **CULTURE**. They also formed parts of the overall factors identified as affecting Internet use by small businesses in the country. In the Field Study these four variables were also among the factors put before the respondents in order to ascertain how their (respondents') Internet habits were affected by the factors.

It is pertinent to define the selected variables used in this study. The idea is to give an operational understanding of the terms in order to avoid ambiguity. As shown in Fig 4.1, the issue of **Cost** (Cost of Using the Internet for Business or **CEB)** is looked at from three broad perspectives in this study: Cost of Online Transactions (or Cost of EB Transactions - **CEBX)**; Cost of Acquiring the Internet Technology **(CEBT)** and Cost of Hiring Experts/Consultants **(CEBE)**.
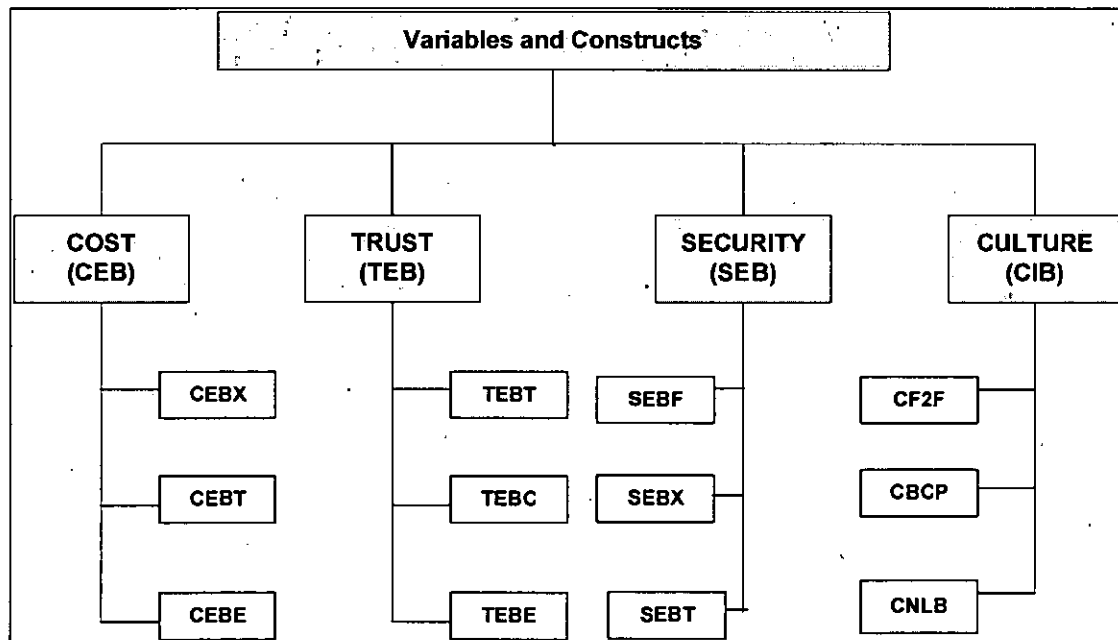
Fig 4.1: Variables and their Components

Similarly in this study, **Trust** in Electronic Business **(TEB)** also has three basic constructs. They are Trust in Internet Technology **(TEBT)**; Trust in Internet Customers **(TEBC)**; and Trust in Internet Experts/Consultants **(TEBE)**.

Security of Electronic Business **(SEB)** comprises Online Fraud **(SEBF)**; ·Security of Online Transactions **(SEBX)** and Security of Internet Technology **(SEBT)**; while **Culture (CIB)** is looked at from three angles: Culture of Face-2Face Trading **(CF2F)**; Business Culture of Control and Power **(CBCP)**; and National Culture (relating to Language Barriers/Differences) **(CNLB)**.

(See Appendix 4.1 for a more comprehensive operational definition of the variables and constructs).

4.6 Instrument Modification

Section 4.2.1 of the Field Study Report (Appendix 1.1) gives details of the changes made to the Questionnaire before it was used for the Field Study. These changes were informed by the findings and experiences gained from the Pilot Study.

One of the findings of the Pilot Study was that small businesses in sub-Saharan Africa (SSA) were reluctant to use the Internet for their business activities due largely to the factors being investigated in this study (see Section 5 of Appendix 1.2). The modifications made to the Questionnaire were meant to make it more appropriate in measuring the respondents' attitude if those inhibiting factors were rectified or if their (respondents') fears were addressed. For instance, if there is a reduction in the COST of acquiring and using the Internet in doing business, how would the respondents' willingness to use the Intemet for their businesses be affected? To answer this (and other related questions), we test the Hypotheses formulated for this study.

Before delving into how changes in each of the variables affected the respondents' willingness to participate in E-Commerce, a general question (Question 4 of Section C) sought to determine the strength or otherwise of the willingness of small businesses to engage in E-Commerce should their identified factors be rectified. The result as captured in Fig 4.2 shows that an overwhelming majority of small businesses are willing to conduct their businesses online if the conditions are acceptably good. In fact, more than

half of the respondents have 'very strong' willingness to conduct their businesses online; while very few of them expressed unwillingness to do so even if conditions improved.

Willingness to Participate in E-Commerce

Frequency

17   19   36   50

Very Unwilling   Unwilling   Willing   Very Willing

Willingness to Participate in E-Commerce
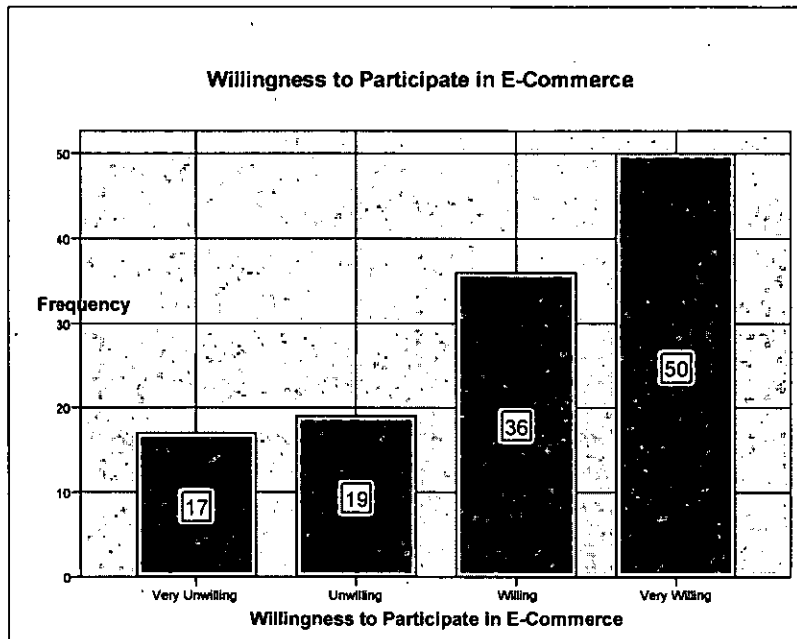
Fig 4.2: Respondents' Willingness to conduct their business Online

This result does not seem to paint the total picture as it does not give the respondents' reaction to each of the factors involved. In order therefore to gauge their responses to each of the factors, an analysis of their responses to the relevant questions in the questionnaire which specifically addressed the issues needs to be carried out.

4.7 Data Analysis

4.7.1 Descriptive Statistics

In this section, the data collected for this study are analysed, addressing one variable after another. Some measures of central tendency like means and medians as well as measures of variability (range, variance and standard deviations) are used in analysing the data. One of the conditions for deciding whether the analyses would adopt either parametric or non-parametric approach is to be determined by the normality test. The assumption of normality is a prerequisite for many inferential statistical techniques (Coakes et al., 2006). This normality test can be explored graphically using stem-and-

95

leaf plot, boxplot, normal probability plot or detrended normal plot approaches. However, we have opted for the histogram approach for its simplicity and ease of interpretation and understanding (Hair et al., 1998). As shown in Fig 4.3, the age of the respondents is fairly normally distributed. However, since most of the data were measured in ordinal and nominal scales, the non-parametric statistical mode would seem to be a more appropriate approach (Anderson et al., 1993).
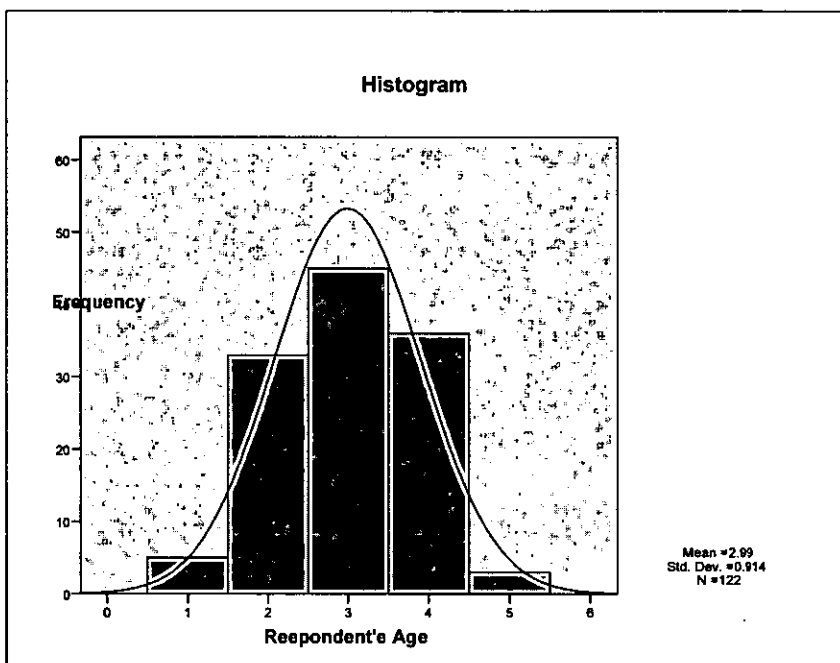
Figure 4.3: Respondents' Age Distribution

4.7.2   Testing the Hypotheses

Received Questionnaire copies containing missing or incomplete data were discarded and therefore not used in the data analysis. This helped in removing the spectre of missing values while using SPSS version 15 in conducting the analysis. Each of the Research Questions was used in formulating a corresponding Hypothesis.

a) The Effect of Cost

i) Research Question One:

What effect will a reduction in the cost of conducting Electronic Business have on the level of SME participation in Electronic Commerce in SSA? To answer this question, the following hypothesis was formulated:

ii) *Hypothesis One:*

H_0: Reduction in the cost of conducting Electronic Business will have no significant effect in the level of SME participation in E-Commerce in SSA (the mean difference is significant at the $\alpha = <.05$ level).

H_1: Reduction in the cost of conducting Electronic Business will have a significant increase on the level of SME participation in E-Commerce in SSA at the $\alpha = <.05$ level.

iii) Testing the Cost Hypothesis

As mentioned above (and as shown in Fig 4.1), Cost (CEB) as a variable is looked at from three perspectives: CEBX, CEBT and CEBE. The data being used in answering the question raised in respect of this variable were generated from the respondents' responses for Questions 3 and 5 of the questionnaire. Question 3 (a, b and c) sought to ascertain how the respondents would react to the proposition of using the Internet for their businesses based on the prevailing situations in the country.

Question 5 (a, b and c) on the other hand captured the respondents' positions regarding using the Internet for their businesses should the conditions in Question 3 change for the 'better'. For instance, if there is a reduction in CEBX, would their decision be affected? Their responses for these two sets of questions are captured in Table 4.3 and Table 4.4. They contain the scores for all the three aspects of CEB as well as those of the other variables under investigation.

Table 4.3: Scores for the Selected Variables from Question 3

Variable		N	Min	Max	Sum	Mean	Std. Deviation
COST (CEB)	CEBX	122	1	4	265	2.17	.977
	CEBT	122	1	4	250	2.05	1.051
	CEBE	122	1	4	272	2.23	1.082
TRUST (TEB)	TEBT	122	1	4	270	2.21	1.046
	TEBC	122	1	4	265	2.17	1.002
	TEBE	122	1	4	267	2.19	.982
SECURITY (SEB)	SEBF	122	1	4	252	2.07	1.042
	SEBX	122	1	4	264	2.16	1.031
	SEBT	122	1	4	262	2.15	1.034
CULTURE (CIB)	CF2F	122	1	4	-	-	-
	CBCP	122	1	4	-	-	-
	CNLB	122	1	4	-	-	-

As stated above (see section 4.1), the respondents' responses were scored (ranging from 1 to 4) on the basis of '1' for 'Very Strongly Disagree' and '4' for 'Very Strongly Agree'. In order therefore to obtain the value for CEBX for example, we simply added all the scores obtained from the respondents' responses in respect of the questions measuring this construct (see also Appendix 4.2).

The data collected were put through a Wilcoxon Signed Ranks Test statistical analysis using the Statistical Product and Service Solutions (SPSS, v.15) software as suggested by Coakes et al. (2006). This method became more appropriate for two basic reasons: one is the fact that (as stated in 4.7.1) the data were measured on an ordinal scale; the non-parametric technique therefore had to be adopted. Furthermore, this method (also known as Wilcoxon t-test) is more appropriate because it is comparing repeated (or paired) measures when the same participants perform under each level of the independent variable (Field, 2005; Coakes et al., 2006; Anderson et al., 1993).

Table 4.4: Scores for the Selected Variables from Question 5

Variable		N	Min	Max	Sum	Mean	Std. Deviation
COST (CEB)	CEBX	122	1	4	340	2.79	1.115
	CEBT	122	1	4	327	2.68	1.137
	CEBE	122	1	4	305	2.50	.998
TRUST (TEB)	TEBT	122	1	4	353	2.89	1.059
	TEBC	122	1	4	328	2.69	1.129
	TEBE	122	1	4	338	2.77	1.097
SECURITY (SEB)	SEBF	122	1	4	365	2.99	1.048
	SEBX	122	1	4	346	2.84	1.086
	SEBT	122	1	4	332	2.72	1.085
CULTURE (CIB)	CF2F	122	1	4	352	2.89	1.030
	CBCP	122	1	4	318	2.61	1.041
	CNLB	122	1	4	342	2.80	.993

However, there is a strong case for using the parametric technique equivalent (a two-sample T-test statistical analysis) especially given that the large sample size criterion is not violated (as $n_1 \geq 30$, $n_2 \geq 30$). The result as contained in Table 4.5 shows that, for the first Cost variable construct (CEBX), the probability level (p) as specified under 'Asymp. Sig. (2-tailed)' is less than the specified alpha value of .05 indicating that the observed t-value is significant. The output therefore indicates that there is a significant difference in the level of willingness for SME participation in the second condition than is the case in the first condition ($Z = -3.874$, $p < .05$).

Table 4.5: Results of Wilcoxon Signed Ranks Test on CEBX

Test Statistics (b)	
	Low Cost of Online Business - Cost of Using Internet
Z Asymp. Sig. (2-tailed)	-3.874(a) <.001

a Based on negative ranks.
b Wilcoxon Signed Ranks Test

The same Wilcoxon T-test analysis was also conducted for each of the other COST constructs of CEBT and CEBE giving Z = -4.354 and Z = -2.195 respectively.

iv) The Implications of the Cost Analysis on SME Participation in E-Business

A look at the results of the Wilcoxon T-test analyses on the three Constructs of the Cost variable (as shown in Table 4.6) indicate that there are significant differences in what the levels of SME participation would be should the Cost of using the Internet for business become cheaper.

Table 4.6: Results of Hypotheses Testing and their Significance Levels

Hypothesis	Variable Constructs	N	Min	Max	Sum		Mean		Std. Deviation		Sig.
					1	2	1	2	1	2	
H_1: Reduction in the Cost of conducting E-Business will affect the level of SME participation in E-C in SSA	CEBX	122	1	4	265	340	2.17	2.79	.977	1.115	-3.874
	CEBT	122	1	4	250	327	2.05	2.68	1.051	1.137	-4.354
	CEBE	122	1	4	272	305	2.23	2.50	1.082	.998	-2.195
H_2: An increase in the level of Trust in E-Business will result to an increase in the level of SME participation in E-C in SSA.	TEBT	122	1	4	270	353	2.31	2.89	1.046	1.059	-4.932
	TEBC	122	1	4	265	328	2.17	2.69	1.002	1.129	-3.588
	TEBE	122	1	4	267	338	2.19	2.77	.982	1.097	-4.375
H_3: An increase in the level of Security on E-Business will result to an increase in the level of SME participation in E-C in SSA.	SEBF	122	1	4	252	365	2.07	2.99	1.042	1.048	-5.637
	SEBX	122	1	4	264	346	2.16	2.84	1.031	1.086	-4.750
	SEBT	122	1	4	262	332	2.15	2.72	1.034	1.085	-3.817

The three Constructs used in measuring this variable have shown that Cost is a very important consideration for the small businesses in their decision to participate in E-Commerce. A look at the Significance level values for the three Constructs shows that with a Significance value of -4.354 (α = <.05), the Cost of Acquiring Internet Technology (CEBT) received more support from the SMEs than the other two Constructs. The other two Constructs that make up

the Cost variable (CEBX and CEBE) also returned significance values of -3.874 and -2.195 respectively. One of the main implications of these levels of significance values therefore is that the Null Hypothesis which states that 'Reduction in the Cost of conducting E-Business will have no significant effect in the level of SME participation in E-Commerce in SSA' has been rejected statistically. It is therefore safe to conclude that H_1 has received statistical support.

There is also the other implication regarding how important each of the Cost Constructs is to the SMEs in their decision-making exercise. A comparative analysis of the significance values shows that the SMEs which participated in this study place more importance to the issue of Cost of acquiring E-Business Technologies (0.63) than on the Cost of Hiring Internet Experts (0.27).

b) The Effect of Trust

i) Research Question Two:

The second research question is as follows: "What effect will an increase in the trust level of conducting Electronic Business have on the level of SME participation in Electronic Commerce in SSA?" To answer the question, the following hypothesis was formulated:

ii) *Hypothesis Two:*

H_0: Increasing the level of trust in Electronic Business will not have any effect on the level of SME participation in E-Commerce in SSA.

H_2: An increase in the level of trust in Electronic Business will result in an increase in the level of SME participation in E-Commerce in SSA.

iii) Testing the Trust Hypothesis

The Wilcoxon T-test analyses results for the three constructs that make up this variable are: TEBT (Z = -4.932); TEBC (Z = -3.588); and TEBE (Z = -4.375).

101

iv) The Implications of the Trust Analysis on SME Participation in E-Business

The issue of Trust is also very important in the decision of the SMEs in SSA to participate in E-Commerce. The result of the Wilcoxon t-test for the three Constructs of Trust (as shown in Table 4.6) shows that Trust is significant at -4.932 (TEBT); -3.588 (TEBC); and -4.375 (TEBE). This therefore implies that while the second Null Hypothesis (H_0) is rejected, H_2 is borne out statistically at the $a = <.05$ level for each of the three Constructs.

Another look at the mean Significance values (as contained in Table 4.6) for the Trust Constructs also shows that the SMEs used in this study very high importance to the issues regarding their Trust in Internet Technologies (TEBT) and their Trust in the Experts (TEBE) in their decision to participate in E-Business. This therefore means that the more the emphasis placed on the ability of both Internet technologies and Internet Consultants to convey trust to SMEs in SSA the more likely it is that more SMEs in the region would be attracted to E-Business.

c) The Effect of Security
i) Research Question Three:
To answer this question: "What effect will an increase in the level of security of Electronic Business have on the level of SME participation in Electronic Commerce in SSA?" The following hypothesis was formulated:
ii) Hypothesis Three:

H_0: Increasing the level of security of Electronic Business activities will not have any effect on the level of SME participation in E-Commerce in SSA.

H_3: An increase in the level of security on Electronic Business will result in an increase in the level of SME participation in E-Commerce in SSA.

iii) Testing the Security Hypothesis

The Wilcoxon T-test analyses results for the three constructs that make up this variable are: SEBF (Z = -5.637); SEBX (Z = -4.750); and SEBT (Z = -3.817).

iv) The Implications of the Security Analysis on SME Participation in E-Business

The third Null Hypothesis (H_0) states that a higher level of security on E-Business will not attract more SMEs in SSA to E-Commerce. After testing the data collected for this hypothesis, the Null Hypothesis was flatly rejected. As shown in Table 4.6, the statistical significance levels for the three Constructs that constitute the Security variable are -5.637 (SEBF); -4.750 (SEBX); and -3.817 (SEBT). At the level of $\alpha = <0.5$, each of the Constructs shows that increasing the Security level will attract more SME participation in E-Business.

A comparative analysis of the Significance values of the Security Constructs shows that the SMEs taking part in the study are more concerned about the Security issues pertaining to Online Fraud (SEBF) than they are with Security issues pertaining to Internet technologies. Their worries are understandable given that in Nigeria, the issue of Internet scams and other fraudulent activities have continued to receive a lot of attention (see for instance, Smith et al., 1999; IDA, 2000; Shemi & Magembe, 2003; Shelly, 2004). The high level of importance attached to Security issues in the decision-making process of the SMEs which took part in the study are reflected on the high levels of statistical significance of their responses.

d) The Effect of Culture

i) Research Question Four:

The fourth research question states: "What effect does culture have on the level of SME participation in Electronic Commerce in SSA?" To answer this question, we formulated the following Hypothesis:

ii) *Hypothesis Four:*

H_0: Culture does not help in increasing the level of SME participation in E-Commerce in SSA.

H_4: Culture will help in increasing the level of SME participation in E-Commerce in SSA.

iii) Testing the Culture Hypothesis

The data used in answering questions about Culture were generated from Question 6 (a, b and c) of Section C of the Questionnaire. The Culture hypothesis was tested differently from the other hypotheses (Cost, Trust, Security and Collaborative E-Commerce). The reason lies in the fact that the question that gave rise to the hypothesis did not conform to the other questions. Furthermore, there are noticeable variations in the culture of the three main geographical zones that make up Nigeria. These cultural differences have their origins in both the religious and traditional history of the regions. In the North where the city of Abuja is located, for instance, there is a predominance of the Islamic religion, while the South-East (where Enugu situates) is predominantly Christian. The city of Lagos (on the West coast of the country) has a mixture of both Christian and Islamic religions as well as some traditional influences.

In order therefore to adequately test the Culture hypothesis in the three regions of the country, we conducted Kruskal-Wallis tests which allowed for possible differences between two or more groups. The Kruskal-Wallis test is the non-parametric equivalent to the one-way between groups analysis of variance (ANOVA). Since the ANOVA test requires interval or ratio data, we decided to use the Kruskal-Wallis test given that our data were both nominal and ordinal.

Kruskal-Wallis test is thus an appropriate statistical procedure for testing whether the populations are identical as it not only gave us the effect of culture on participation in B2B E-Commerce by small businesses, but also the impact of the city (or region) of location of these businesses on culture

(Coakes et al., 2006; Field, 2005; Anderson et al., 1993). The term 'City' which represents the cities of Abuja (North), Lagos (West) and Enugu (South-East) is used as the independent variable.

As stated above (see for example, Table 4.4), Culture is looked at from three perspectives: Business - Face-to-Face Trading (CF2F); Organisational - Power and Control of Online Business (CBCP); and National - Language issues being an impediment to participating in B2B E-Commerce (CNLB).

Table 4.7: Results of Kruskal-Wallis Tests on CF2F across the Cities of Location

<table>
<tr><th colspan="4">(a) Ranks</th></tr>
<tr><td></td><td>City of Location</td><td>N</td><td>Mean Rank</td></tr>
<tr><td>Biz only on Face2Face basis</td><td>Abuja</td><td>35</td><td>67.71</td></tr>
<tr><td></td><td>Lagos</td><td>63</td><td>57.68</td></tr>
<tr><td></td><td>Enugu</td><td>24</td><td>62.46</td></tr>
<tr><td></td><td>Total</td><td>122</td><td></td></tr>
</table>

<table>
<tr><th colspan="2">(b) Test Statistics (a,b)</th></tr>
<tr><td></td><td>Biz only on Face2Face basis</td></tr>
<tr><td>Chi-Square</td><td>2.001</td></tr>
<tr><td>df</td><td>2</td></tr>
<tr><td>Asymp. Sig.</td><td>.368</td></tr>
</table>

a Kruskal Wallis Test
b Grouping Variable: City of Location

The culture of conducting business on a face-to-face basis is put through a Kruskal-Wallis test across the three cities used for the study. The result as contained in Table 4.7(b) shows that with the Pearson's Chi-square value of 2.001 and a degree of freedom value of 2, there is a significance (p) value of .368. This significance value is well above the alpha level of .05 indicating a rejection of the statement as contained in the questionnaire: 'I can not participate in online trading because I can not do business with a customer I do not see'.

The values in Table 4.7(b) indicate that there are significant differences across the three cities on the business culture of face-to-face trading, $X^2(2, \underline{N} = 122) = 2.001$, p > .05. These differences are also reflected on the mean ranks as contained in Table 4.7(a).

A more critical look at the individual cities (see Appendix 4.2) however shows that while there is a significant relationship between them on the issue of 'Face-to-face' trading, an overwhelming majority of the respondents did not see this culture as being an inhibition on them in taking part in B2B E-Commerce (with values of 65.7%, 63.4% and 70.9% recorded for Abuja, Lagos and Enugu respectively).

Similar tests were also conducted in respect of CBCP and CNLB constructs. The results show that the former recorded $X^2(2, \underline{N} = 122) = .268$, p > .05 while the latter recorded $X^2(2, \underline{N} = 122) = 5.804$, p > .05. These results show varying levels of rejection of their respective questions.

Looking at the hypothesis as a whole therefore, it is obvious that H_0 is flatly rejected meaning that Culture has significant effect on the level of B2B E-Commerce participation by small businesses in SSA.

iv) **The Implications of Culture Analysis on SME Participation on E-Business**

The Culture hypothesis was tested using the Kruskal-Wallis test which is the non-parametric equivalent of the one-way between groups analysis of variance (ANOVA). This Kruskal-Wallis test became appropriate as the ANOVA test requires interval or ratio data which is not the type of data being analysed.

The result of the test shows that the fourth Hypothesis (H_4), which states that the Culture of the people of SSA will help in increasing the level of SME participation in E-Business in the region, is upheld. The significance levels of the three Constructs contained in the Culture variable (see Table 4.8) are: 2.001 (CF2F); .268 (CBCP); and 5.804 (CNLB).

Table 4.8: Results of the Culture Hypothesis Testing and their Significance Levels

Variable		N	Min	Max	Sum	Mean	Std. Deviation	Sig.
H₄: Culture will help in increasing the level of SME participation in E-C in SSA.	CF2F	122	1	4	352	2.89	1.030	2.001
	CBCP	122	1	4	318	2.61	1.041	.268
	CNLB	122	1	4	342	2.80	.993	5.804

To fully understand the results of the test, it is important to look at the framing of the questions with which the data were generated. Question 6 (a, b and c) of Section C was negatively framed. This therefore means that for the resultant data to support the hypothesis, the result of the test must be more than the significance level of .05 (ie α = >0.5). One of the questions states: "I can not participate in Online trading because I can not do business with a customer I do not see". If therefore the data show that majority of the respondents agreed with the statement, then the test would show that it is against the people's culture to do business with unseen customers. From that perspective therefore, Culture does not support the level of SME participation in E-Business. If however, more SMEs reject this statement (as is the case from the data generated), it then means that contrary to the statement, more SMEs are willing to do business online with customers not physically being seen at the time of the transactions. The same analysis applies to the Business Culture of Control and Power (CBCP) Construct which states: "I can not participate in online trading because I do not engage in business deals in an environment I can not control".

This therefore means that at the significance level of α = >0.5, the notion of the SMEs not doing business with either unseen customers or in a virtual environment is flatly rejected which implies that more SMEs will participate in E-Business (even though their customers or the environment of the transactions may be virtual). Culture therefore has significant effect on the level of SME participation in E-Business in SSA.

e) **The Effect of Collaborative Electronic Business**

Research Question Five:

In order to test the fifth hypothesis, we subjected the Model (designed in Chapter Five) to a rigorous validation (and verification) exercise. The steps taken as well as the results obtained from the exercise are explained in Chapter Six.

4.8 Summary

The first four Hypotheses used in this study have been successfully tested and have been found to receive different levels of statistical significance. Two different statistical analytical methods have been used: the Wilcoxon T-test (for Hypotheses 1 to 3) and the Kruskal-Wallis test which is the non-parametric equivalent of one-way group analysis of variance (ANOVA). The reason for using two different types of analysis is due to the differences in the Research Questions.

Now that the first four of the Hypotheses have been tested, we will attempt to use the results of the tests in designing appropriate Business and Technological Models. The fifth Hypothesis which involves the validation of the proposed Model will be tested in Chapter Six following the design of the Model in Chapter 5.

CHAPTER FIVE

5.1 Proposed Business Model

A business model is not a description of a complex social system itself with all its actors, relations and processes. Instead, it describes the logic of a "business system" for creating values that lies behind the actual processes. Therefore we understand a business model as the conceptual and architectural implementation of a business strategy and as the foundation for the implementation of business processes (Petrovic et al., 2001).

5.1.1 Introduction

There are two basic ways a company can capture value from new technology: through incorporating the technology in their businesses or through launching new ventures that exploit the technology in new business arenas (Chesbrough & Rosenbloom, 2002). The business model being proposed here is intended to adopt the former approach.

Following the commercialisation of the Internet during the 1990s, various attempts have been made to create a schema for the classification of the various types of business models particularly those adapting to the Internet technology (see for instance, Vitale et al., 2002; Timmers, 1998; Bambury, 1998; and Osterwalder & Pigneur, 2002). The Internet provides the platform for new modes of commerce and new forms of business models as well as the reinvention or remodelling of old tried-and-tested modes of business models such as auction, barter, cataloguing and direct sales.

According to a Draft Proposal by the United Nations Economic Commission for Africa (UNECA, 2006), the digital economy is radically changing international trade affecting business practices and introducing new business intermediaries. This has given rise to a situation where conducting old businesses in new ways and embracing new business approaches and opportunities have become a part of the economic transformation necessary to participate in the digital economy.

Before discussing the specific business model suitable for SMEs in SSA, it is pertinent to reflect on what the current business environment in the region looks like. This is necessary because a good grasp of the complexity and magnitude of the problems is a requirement in designing appropriate solutions.

5.1.2   Prevailing Business Environment in SSA

As has already been stated in the Literature Review (Chapter 2), SSA with 49 countries is a region with an estimated population of 633 million people (about 10% of the world population). The region, though demographically one of the fastest expanding markets in the world (Nwankwo, 2000), is characterised by low income and low levels of human resource development as well as structural, social, political and economic weaknesses (Austin, 1990; Mbarika et al., 2005).

Many of the countries in the region have continuously suffered from poor economic development, high foreign debt, and declining resources and social infrastructures (Adam, 1996a). To compound the situation, the region is the least developed in the world in terms of telecommunications and technological infrastructures (Odedra et al., 1993; Mbarika, 2001; Mbarika et al., 2005). Furthermore, as observed by Oyejide and Wangwe (2003), a lot of SSA countries have not successfully developed either a technologically dynamic or internationally competitive industrial base. All this has given rise to the region being seen as highly unstable politically and economically, with a high risk of investment and an absence of reliable information sources (Nwankwo, 2000).

For the small trader, the harsh economic realities in the region make the survival and growth of their businesses a gargantuan task. Added to this is the prevalence of such fraudulent activities as advance fee fraud and other criminal activities. Nigeria and Uganda, for instance, are among the countries in SSA which have been associated with a high level of advance fee fraud (Smith et al., 1999; Shelly, 2004). As observed in the field study, though many

110

SMEs in Nigeria avoid engaging in E-Commerce activities due largely to their lack of trust in the Internet technology as well as their fear of fraud and security of online transactions, most of them are still willing to participate in the E-Commerce revolution (Ojukwu & Georgiadou, 2007).

There is also the issue of modes of paying for goods and services rendered. Traditionally, businesses in SSA are more conversant with face-to-face transactions where the providers and customers physically 'haggle' and bargain with each other over the prices of goods and services. Even when prices are agreed to, payment, usually through exchange of physical cash, is made instantly as the goods and services exchange hands. Biggs and Shah (2006) refer to this kind of business relationships as self-enforcing cash-on-delivery spot transactions. Incidentally, this mode of trading and making payment is gradually but steadily being consigned to history, especially amongst city businesses. The reasons for this change are many. Paramount among them is the high level of risks and inconvenience associated with carrying large sums of money from place to place. (It needs be stressed however that SSA is not alone in this age-long practice. In fact, according to the 18th Statistical Survey Report on the Internet Development in China published by China Internet Network Information Centre, most Chinese people still prefer face-to-face transactions to online ones (CNNIC, 2006). The report also shows that less than 5% of the Chinese population have credit cards.)

The Regional Programme for Enterprise Development (RPED) survey conducted by the World Bank in the 1990s paints a grim picture of the state of business relationships in SSA. According to this survey, the economies of SSA are prone to shocks such as periodic weather-related distress in agriculture, civil strife, terms-of-trade shocks, frequent policy changes and poor policy management, corruption, infrastructure breakdowns and so on. These result in: unanticipated changes in prices and transport costs; shortages in critical inputs; production setbacks; delays in payment from

customers; transportation problems and fluctuations in income often rendering firms unable to pay on time or deliver promised goods to customers (see www.worldbank.org/rped).

Another contributory factor to the harsh business environment in SSA is that the region has also experienced scarred history of exploitation. Adding to the endemic afflictions plaguing the region are incessant civil and tribal wars (affecting over 8 million people); HIV/AIDS pandemic (with 70% of the world's cases occurring in the region); seasonal droughts affecting some of the countries in the region as well as hunger, mismanagement and corruption. Many nations in the region continue to suffer from badly performing economies, high foreign debt, declining resources and social infrastructures, alarming population growth, increased dependency, degradation of the environment and other debilitating ailments (Adam, 1996a; Mbarika et al., 2005).

While most of the things featured in the RPED survey are still true of the SSA situation, a lot of changes and improvements have however taken place in the region. For one thing, it has been established that the volume and geographical spread of transactions being carried out by SMEs in the region is on the increase. These changes notwithstanding, a lot more still needs to be done to change the 'ugly' picture of the economic horizon of the region which, according to Biggs and Shah (2006) has attendant negative consequences for market participation of "outsiders". This therefore makes it imperative that modem ways of conducting transactions, making payment and delivering the traded items should be adopted.

5.1.3 Contributors to the Proposed Model

Having reviewed the problems facing SMEs in SSA, our focus of attention now shifts to mapping out a business model that would be suitable to the business environment of the region. The proposed business model seeks to

emphasise the modern while still accommodating some of the traditional modes of conducting business. This is what informs the term *Tradem*. It is coined to accommodate the mixture of both the TRADITIONAL and the MODERN ways of doing business. The idea is that a sharp, blind leap into modern digital business practices could be counterproductive. This model therefore provides a kind of smooth transition from the traditional to the modern. It also seeks to create a conducive or enabling environment which would ease the deployment and implementation of the technology thereby making it a lot easier for SMEs in the region to expand their market globally.

As has been seen in Chapter 2, the Internet contains many classifications and taxonomies of business models flowing from the kinds of business activities the technologies support (see for instance, Afuah and Tucci, 2001; Amit and Zott, 2001; Gordijn and Akkermans, 2001; Timmers, 1998; Tapscott et al., 2000). However, two propositions, one by Rappa (2004) and the other by Weill et al. (2005) deserve a closer look.

According to Rappa (2004), a business model is the method of doing business by which an organisation can sustain itself by generating revenue. It spells out how a company makes money by specifying where it is positioned in the value chain. Rappa's taxonomy regarded in some quarters as one of the most rigorous, is based on the ontology propounded by Osterwalder & Pigneur (2002) in which they argued for a comprehensive taxonomy using customer relationship as the primary dimension for defining categories. Rappa proposes nine model categories: Manufacturer (Direct), Merchant, Affiliate, Community, Brokerage, Advertising, Infomediary, Subscription and Utility. Weill et al. (2005) on the other hand propose four basic types of business models: Creators, Distributors, Landlords, and Brokers. They also identify four types of assets being involved in those models as Financial, Physical, Intangible, and Human, ending up with 16 Business Model Archetypes (BMAs) which are specialised variations of their original four models (see Table 5.1).

Basic Business Model Archetype			What type of asset is involved?	
	Financial	*Physical*	*Intangible*	*Human*
Creator	**Entrepreneur**	**Manufacturer**	**Inventor**	**Human Creator***
Distributor	**Financial Trader**	**Wholesaler/ Retailer**	**IP Trader**	**Human Distributor***
Landlord	**Financial Landlord**	**Physical Landlord**	**Intellectual Landlord**	**Contractor**
Broker	**Financial Broker**	**Physical Broker**	**IP Broker**	**HR Broker**

Let us now look a little more deeply into some of the categories of the propositions mentioned above. Rappa's *Direct (Manufacturer)* model urges for a direct relationship between the manufacturer of goods and their customers using the Internet technology. The customer here can be an end-user or a vendor.

This model is somewhat similar to the *Creator Model* proposed by Weill et al., 2005. Here the Creator, like the Manufacturer, uses raw materials or components from suppliers to assemble or transform products which are sold directly to the customers. One good example of companies using this model is Dell Computers. This will form part of the proposed model because the group being used for this study are producers of various forms of arts and crafts. They can therefore adopt this model in their business strategies and organisational policies.

There are four components in Rappa's *Manufacturer Model* – Purchase, Lease, Licence and Brand Integrated Content. They all define relationships between the Manufacturer and their customers. The *Purchase* variety involves

---

These forms are not allowed in some countries like the US because they involve selling human beings. They are included here for logical completeness.

114

wholly transferred to the customer. The *Lease* variety is the transference of the right to use the product to the customer under a 'terms of use' agreement with the producer retaining ownership right. At the expiry of the rental period, the product is returned to the producer. Blockbuster Video Club is a good example of a business adopting this variety. Sometimes, "a right of purchase" might be included in the agreement upon the expiration of the lease. There is also the *Licence* type of this model which involves the sale of a product that allows only the transfer of usage rights to the customer with ownership rights being retained by the manufacturer. This is very popular in software licensing. It differs from the *Lease* variety in the sense that the licensee can keep the product indefinitely.

Rappa's *Merchant* model has four identifiable components: Virtual (or e-Tailer), Catalogue, Click-and-Mortar and Bit Vendor. The *Virtual Merchant (e-Tailer)* uses the Internet as their sole medium of operations (eg. Amazon.com). The *Catalogue Merchant* uses mail order with an online catalogue. Orders are placed using a combination of mail, telephone, fax and online ordering methods. The *Click-and-Mortar Merchant* uses a combination of both the brick-and-mortar as well as the online storefront approaches. Goods and services in this model are delivered to the customers using both traditional and electronic means. The *Bit Vendor* is strictly involved in digital products and services and conducts sales and deliveries electronically (eg Apple *iTunes*). From the perspective of the art producers we are dealing with, the *Bit Vendor* and the complete *e-Tailer* varieties are totally inappropriate. This then means that both the *Click-and-Mortar* and the *Catalogue Merchant* would be considered in designing the proposed model.

Rappa's taxonomy also includes Advertising, Infomediary, and Brokerage models. Some aspects of these models would be integrated in our proposed model. The *Advertising* model according to Rappa is an extension of the traditional media broadcast. In this case, a web site provides content usually for free, but services carry mixed messages in the form of banner ads which may provide sources of revenue for the owner of the site. The *Portal* and

Classified varieties of the Advertising model would be adapted for our proposition. The former which is usually a search engine may include varied contents or services which carry paid adverts. The latter contains list of items for sale or wanted for purchase. Revenues are generated from listing fees or membership fees.

The *Brokerage* model (Rappa, 2004) is similar to the *Broker* model (Weill et al., 2005). They are forms of intermediary bringing buyers and sellers together to facilitate transactions. Four aspects of Rappa's model (*Auction, Transaction, Distributor,* and *Search Agent*) would be of interest to us. *Auction* brokers (eg. *eBay.com*) conduct auctions for sellers and manufacturers with revenues coming in forms of seller fees or commission scaled with the value of transaction. *Transaction* brokers are like Escrow (eg Paypal), providing third party payment mechanisms for buyers and sellers. This role in our proposed model would be played by the banks acting as parts of intermediating institutions (or facilitators) for both the artists and their customers. A *Distributor* in the view of Weill et al. (2005) can also buy and sell, but in Rappa's view, he is a catalogue operator who connects a large number of product manufacturers with volume and retail buyers thereby facilitating business transactions between them. In our case, a *Distributor* is the shipping agent who delivers the purchased goods to the customer.

Infomediary provides data about consumers and their profiles. Customer profile analyses can provide valuable data used in marketing campaigns, targeting niche markets. In the same way, data about producers and their products are useful to consumers. *Informediaries* (information intermediaries) assist buyers and sellers to have access to existing markets that meet their interests. In our case, this function can either be played by outsiders or we can achieve same using the *Cookies* and *Spam* technologies embedded in the system (this will be discussed in the Technological Model). Two aspects of the *Informediary* model (*Incentives Marketing* and *Advertising Networks*) would also be integrated in the proposed model. The former deals with

customer loyalty programmes and marketing strategies providing incentives to customers (like discounts, redeemable points and coupons). The latter collect data about web users which can be used for effective marketing.

Looking generally at Rappa's and Weill et al.'s taxonomies and given the nature of the business culture prevalent in the SSA region, a combination of some aspects of some of the components becomes imperative. This is even more so, given that a) No single component or model can successfully fit into the SSA business   environment; and b) The targeted group for the business model being proposed here are the crafts producers whose business orientations and methods do not fit into a single taxonomy.

5.1.4   The Place of Culture in the Proposed Model

Some of the functions contained in the taxonomies propounded by Rappa and Weill et al. would be performed internally using other actors and means. For instance, some of the Informediary functions would be undertaken by the technology. This therefore means that our proposed model, while emphasising direct relationships between the artists and their customers, would at the same time be using intermediating institutions or facilitators in achieving this goal. The model being proposed here also seeks to go beyond those already proposed by Rappa and Weill et al. by integrating infrastructure management; transaction and relationship facilitation; as well as distribution functions.

Incorporating these aspects in the proposed model is very important as the model seeks to serve two clear-cut purposes: providing a transitional platform for a gradual and pain-less migration from the traditional to the modern forms of conducting business; as well as providing a platform for those who wish to continue with a combination of the two forms of business practices in their business practice.

117

This therefore means that taking cognisance of the impact of culture in both the production and marketing of crafts in the region, some cultural practices would of necessity, be integrated into the proposed model. One such cultural practice is inspired by the *Isusu* scheme (or ROSCA which stands for "Rotating Savings and Credit Association", Bouman, 1994). As already discussed in 2.2 of Chapter 2, this scheme encourages the coming together of individuals, family groups, and/or small businesses to form strong bodies that pool their resources together to achieve objectives which individual members on their own may not be able to do.

As we have established in the results of the analysis of our Field Study data (see 4.6.2 of Chapter 4), the issue of the COST of using the Internet is a source of worry to many small businesses in SSA as a lot of them feel that the cost is too burdensome for each SME to shoulder alone. In addition to the advantages of "sharing the costs" through "pooling resources together", creating the platform for collaboration amongst some SMEs would also give more legitimacy and reliability to the participating group. This is very important in attracting the "outsiders" (Biggs & Shah, 2006), or more appropriately global participation in the region's business efforts. In our view, the more SMEs participate in this kind of group arrangement, the easier it would be for them to attract international patronage. Our argument here is that a single SME in SSA can easily disappear or go underground if it fails to honour its contractual obligations to a foreign business partner. If the same SME is involved in a group such as the one we propound in this project, shared responsibility and the fear of being exposed may deter it from defrauding its foreign (as well as local) trading partners.

Another very important cultural contribution to the proposed model is that, like the *Isusu* scheme, members participating in the group should agree on an initial (and, possibly subsequent periodic) level of contribution which would help in the running of the group machinery. These financial contributions would serve as tickets for participation. They would also serve as investments

which would give each participating member a stake in the collaborative enterprise.

Furthermore, a memorandum of understanding (MOU) or any similar document could be drafted and agreed upon by group members. Such a document should state how much each member should contribute in order to participate in the scheme. It should also stipulate how often such contributions should be made and how much each member is expected to contribute. The money realised from these exercises would help in the day-to-day running of the network like paying for the services of Internet service providers (ISPs) that would host the network. The document should also state how affairs would be managed in the event of one member defaulting or withdrawing from the group.

There should also be a kind of forum for the members to share their individual and collective concerns about how the network is working and how further improvements could be made. Such a forum can also involve the Consultants (or any other persons involved in the administration of the network) as the group deems necessary.

5.1.5 The Proposed Business Model

Ontology essentially gives a common understanding of a specific domain by defining its elements and the relationships between these elements (Osterwalder et al., 2002). The main elements or components of the proposed model are ARTISTS (or CREATORS), FACILITATORS (or INTERMEDIATING INSTITUTIONS), TECHNOLOGY (or PLATFORM), and CUSTOMERS. Our model would be a fusion of some aspects of both Rappa's nine models and those proposed by Weill et al., as well as some traditional elements that form parts of the *Isusu* scheme. We would also incorporate some other elements gleaned from the literature review as we deem necessary. Furthermore, we plan to reflect the results of our data analyses in designing the proposed model. As contained in Table 5.2, the relationships

existing between the components and their various types and functions in the overall model are clearly explained.

Table 5.2: Components and Functions of the Proposed Model

Component	Type in the Group	Functions/Roles	Other Relevant Contributions		
			Weill et al. (2005)	Rappa (2004)	Others
Artists	A group of Arts/Community of Crafts Makers	Produce works of arts/crafts from raw materials or components and offer them for sale. Collaboration & sharing of facilities. Collaborate and share some resources.	Creator	Manufacturer	Thesis contribution
Facilitators	1. Banker	Facilitates financial exchanges between Artists and Customers; Insurance	Financial Broker	Brokerage (Transaction)	Escrow.com; PayPal.com;
	2. Distributor	Delivers sold items from Creator to Customers	Distributor	Brokerage (Distributor)	Shippers or Shipping Agents
	3. Consultant	Designs and Maintains the Internet site; carries out other professional duties (like staff recruitment and training) for the group.	Broker (Human Resources)	Brokerage, Informediary	Thesis contribution
	4. Government	Creates conducive legal environment, conflict resolution and law enforcement functions.	–	–	Satola, 2002; NNPIT, 2001; Thesis.
Technology	a) Internet and b) Brick-&-Mortar	Platforms for transactions; contain works of arts/crafts, catalogue, etc.	–	–	Weill and Vitale, 2001;
Customer	a) Dealer (Reseller), or b) End-User	Visits Internet site (or shop front or exhibition hall) and sees Catalogue (or Brochure), then orders and pays for arts/crafts	Distributor (Wholesaler or Retailer)	Merchant	Face2Face (Traditional); Thesis contribution

According to available literature, an Internet-based business model can be looked at in one or a combination of some of the following functions: production; revenue- and product-specific; business actor-network-specific; supply chain management-specific; customer relationship; as well as marketing-specific; production innovation; infrastructure management; financial management and control; legal framework; etc (see for instance, Osterwalder et al., 2002; Petrovic et al., 2001; Gordijn et al., 2001; Dai and Kauffman, 2001; Timmers, 1998; Rappa, 2004). Stehling and Moormann

(2002) for example, identified seventeen business models based on 3 broad criteria: universality, degree of relevance, and applicability to the Internet.

The model being proposed here is a fusion of some aspects of the customer relationship variety with other aspects of infrastructure management and distribution-specific functionalities. It is pertinent to stress here that while some of these components may feature in some of the major activities of the model, others may not, even though all of them should feature at some point or the other within the framework of the model. Furthermore, although some of the components may share the same names with the ones in the existing models, they may not necessarily perform the same functions.

5.1.6 Major Functions of the Components

There are four major activities or functions that can take place in the proposed Model. These are: Awareness Creation; Sales/Payment; Management/Maintenance; and Delivery/Distribution. These functions and activities can be further decomposed.

(a) Awareness Creation

Some of the components which can feature in the life of this activity include: Search Agents, Incentive Marketing, Face to Face, Classified, Catalogue, and Advertising Networks. The Artists would use a range of media mix to attract the attention and interest of the Customers. As shown in Table 5.3 (and in Fig 5.1), an E-Catalogue containing photographs and information about the artworks would be published online (with a hard copy equivalent kept on the shop front and a brochure kept in an exhibition hall for Face2Face transactions). Also, some craft items can be advertised on the Internet classified pages while the web information would be advertised using Search Agents (like Google.com).
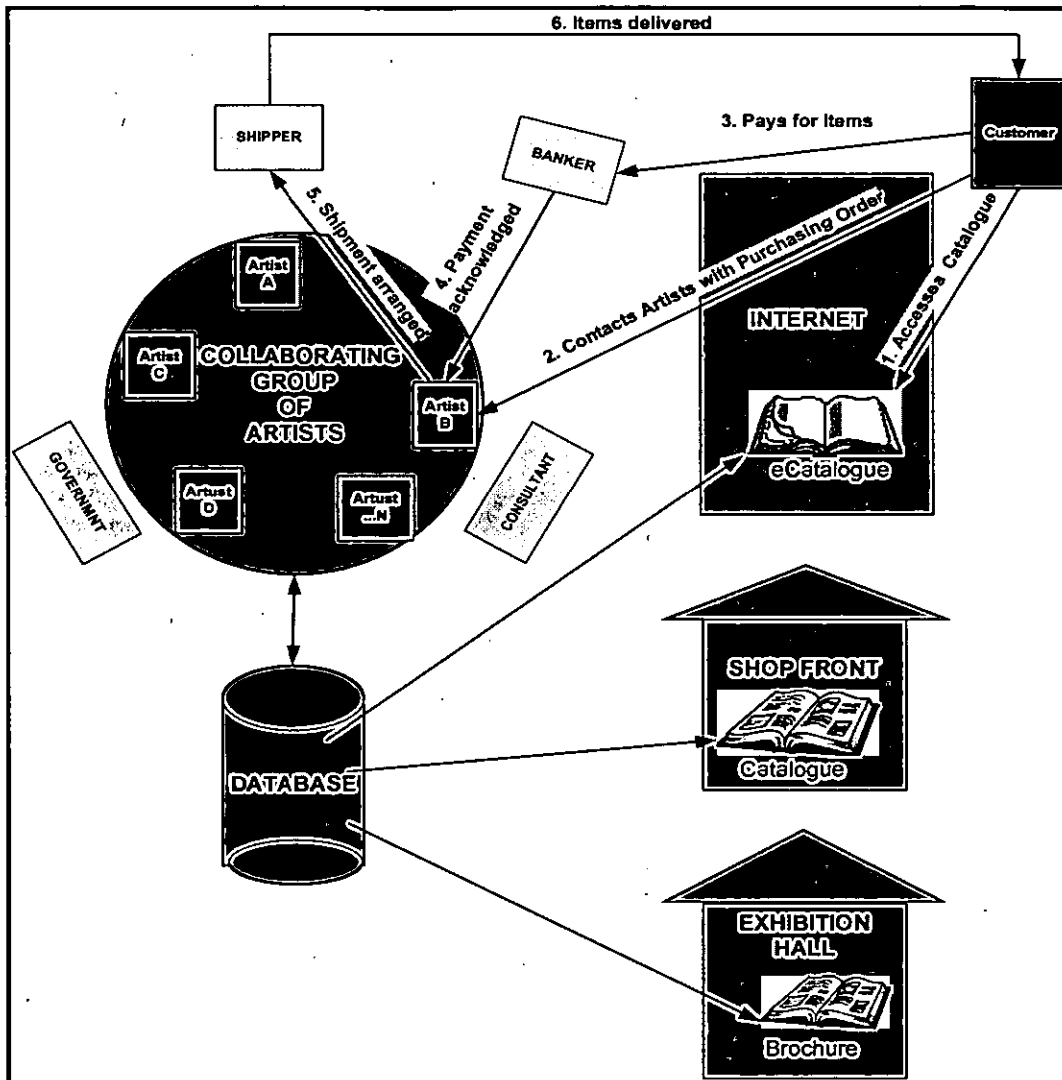
Figure 5.1: Actors and Some of the Transaction Processes in the "Tradern" Model

(b) Management/Maintenance Function

Some of the components involved in this function include Artists, Consultants, (and in certain cases Government), Internet Technology, Landlords (Contractors), and Catalogue (containing product information). Here, based on the briefings of the Artists, the consultants would

- Set up a website, manage and update the contents;
- Design E-Catalogue which displays produced art works;
- Advise the Group on the availability of new systems and upgrade where necessary;
- Advise the Group about new laws and policies of government;

122

- Hire and train staff who administer each of the participating artists' internal legacy systems (like Personnel Management Systems, ERP, etc);

- Maintain Customer DBMS and manage the Customer Relationship Management Systems (CRMS);

- And any other functions as required by the Artists.

(c) Sales/Payment Function

This would involve Catalogue (or Brochure), Click/Mortar, Face2Face, Search Agent, Purchase, Auction, Classified, Lease, and Intermediating Institutions (for example, Banks and Government). Sales are the outright purchase or lease of an item by a Customer. This can be done on a Face2Face basis (purchase and lease), Auction (purchase only), or through the Banks (both purchase and lease). When a purchase takes place, the Customer takes full custody of the sold item after paying for it.

Payment entails paying at the tills on the Shop floor (Face2Face) or paying online (through cheques, credit/debit cards, etc) to the accredited Bank in accordance with the prevailing exchange rates and in line with existing financial guidelines. If through credit/debit card, the Banks would check that the Customer has enough credit to cover the cost of the item.

Table 5.3: Actors and Components involved in the Four Major Functions

	FUNCTIONS			
	Awareness Creation	Sales/ Payments	Management/ Maintenance	Delivery/ Distribution
ACTORS	Artists, Consultants, Customers, Government	Artists, Banks, Customers, Government	Artists, Consultants	Artists, Shipping Agents, Customers, Government
COMPONENTS	Search Agents, Portal, Catalogues, Advertising Networks, Classified, Incentive Marketing	Transactions Broker, Auction, Lease, Purchase,	Shared Infrastructure, E-Catalogue (or Brochure), Click & Mortar,	Distribution, Artworks, (Government).

If the transaction is conducted online (as shown in Fig. 5.1), a Customer's **Purchase Order** (PO) can be processed by the Artist (or their agents). Customers' orders can be placed in any of the following ways:

123

i) By choosing an artwork that is unique;

ii) By choosing from a set of artworks in the catalogue;

iii) By choosing a particular size, colour or other variant from the displayed artworks; and

iv) By requesting custom-made artworks (based on their individual taste and specifications.

(d) Delivery/Distribution Function

This involves Artists, Face2Face, Shop front, and an Intermediating Institution (Shipping Agent) and a possible involvement of Government (see Table 5.3). The Face2Face aspect takes place when the Customer takes delivery of the purchased item directly from the Shop front even though the previous activities (like communicating with the Artist and making payment) may have been done electronically. The other aspect involves a distributor moving the paid item from the Artist to the Customer (Dealer) after the payment has been made.

5.1.7 AKA Group – The Journey towards E-Business Participation

As has already been stated (see Chapter 2, section 2.5.5; see also section 4.2.3 of Appendix 1.1), members of the AKA Group being used for this study satisfy the membership structure of the proposed *Tradem* model. The characteristics of the group show that they are individual small businesses, producing various types of arts and crafts, and are conducting joint exhibitions through which they showcase and market their products. They also engage in individual sales activities using their "Shopfronts" which in this case can be their galleries or small corner shops).

What this project seeks to achieve is to, in addition to many others, incorporate the *Tradem* model technology into the AKA Group's business strategy as enunciated by Chesbrough & Rosenbloom (2002). Furthermore, it will provide the group and those forming similar groups in future with the

technology and business models which would enable them exploit the benefits and geographical spread of the Internet. It is envisaged that other SMEs deploying the technology would experience the same kind of benefits which therefore underscores the universality, reusability and re-deployability of the model.

It is also envisaged that this model will satisfy the resource savings and workload capacity conditions as stipulated by Gilb (2005). The resource-savings attribute comes from the fact that the model has multi-user capacity which allows more SMEs to participate in its use. Its workload-capacity characteristic derives from the fact that the model is designed to multi-task: store information, allow information retrieval and data processing.

5.1.8 Strategies for Success in the Proposed Model

Saunders (1995) has identified four stages in the deployment of E-Business capabilities. These are Piloting, Migrating, Transforming and Focused E-Business. In order to succeed in the E-Commerce environment, a participating business must develop sound business strategies, a strategic position and execute their business operations well (Haag et al., 2007). The authors identified three critical success factors (CSFs) as being central to successfully executing business strategies in the new economy: a) understand your business and your customers; b) find and establish relationships with customers; and c) move money easily and securely. These three CSFs are further discussed below.

(a) Understanding the Business, Products, Services, and Customers

One of the prerequisites for gaining a competitive advantage and being successful in any business is the ability of the entrepreneur to clearly define the nature of their products and services as well as being able to identify who their target customers are (Haag et al., 2007). There is also the need to understand how their customers perceive the use of their products and services in their business activities. To create sound business strategies

125

therefore, the Artists must have an understanding of the value their customers place on their products and services. Porter (1990, 1998) also identifies interaction with informed customers as one of the four pillars of his strategic competitive advantage model.

Since the Artists would compete in a commodity-like business environment, they need to find competitive prices for their products, make ordering of their products easy for the customers, speed up delivery, and make their return policy customer-compliant.
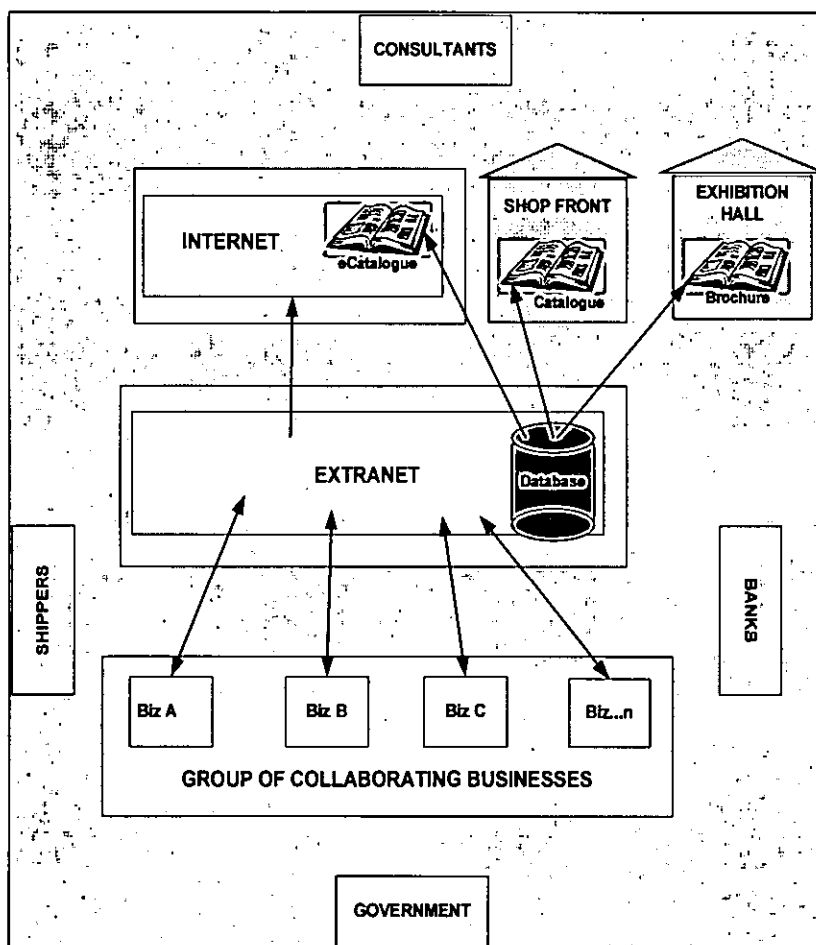
Fig. 5.2: Some Components of "Tradern" Model Highlighting the 3 Levels

126

(b) Finding and Establishing Relationships with Customers

Customers of the proposed model can be individual end-users (B2C), other businesses (B2B), or a combination of both. Knowledge of who their customers are is essential in designing an appropriate strategy to market to them. Reaching and attracting their customers can be achieved through appropriate marketing mix which might include using search engines, online advertising, incentive marketing and other marketing strategies.

(c) Moving Money Easily and Securely

According to Haag et al. (2007), every business participating in E-Commerce must create IT systems that enable their customers (both end consumers and other businesses) to pay electronically, easily, and securely for their purchases. In a B2C environment, the most commonly used forms of payment are credit and debit cards, financial cybermediaries (like PayPal; electronic cheques, electronic bill presentment and payment (EBPP) (eg www.checkfree.com or www.quicken.com), or smart cards.

In a B2B environment however, paying for goods and services can, in addition to some or all the aforementioned methods of payment, take a different form. The reason being that the customers in this form of E-Commerce transaction tend to make large purchases usually paid for through financial electronic data interchange (EDI) and often in large, aggregated amounts encompassing many purchases (Haag et al., 2007). One of the ways to implement EDI-facilitated transactions is a B2B e-marketplace that supports EDI through a value-added network. An example of such e-marketplace is Global eXchange Services (GXS at www.gsx.com). GXS, formerly known as General Electric (GE) Information Services, supports one of the largest B2B e-marketplaces in the world with more than 100,000 trading businesses processing over a billion transactions annually and accounting for over $1 trillion in products and services (Haag et al., 2007). The actual reconciliation of the payments usually occurs through a bank or an automated clearing house (ACH) support site (like National Cash Management System at www.ach-eft-ncms.com/index.asp).

5.1.9   Making Payment in the Proposed Model

For the proposed model, we recommend the use of a bank playing the role of an intermediating institution (or facilitator, ACH or Escrow) for each *Cluster*. This method according to Panurack (1966), entails using an intermediary to collect money electronically (or through other means) from the buyer. The reasons for using a bank for the role are multifarious: for one, a bank provides the needed security and underwrites the risks involved in the transactions. Besides, it can keep the paid money in trust pending the successful completion of each transaction before crediting the accounts of the seller.

In China, for instance, online payment is becoming easier, with a new Shanghai-based company, Chinapay, offering city-wide online payment system ("Linking Up", *Far Eastern Economic Review*, 24 August 2000) and a similar company (Cyber Beijing) operating in the capital (though without being able to process transactions in real time). Even most established E-Commerce enterprises use the escrow system for processing their payments. *EBay* for instance, uses Paypal for its payment processing activities.

This method also gives a seal of credibility and authenticity to transactions. According to OECD, e-shoppers may be reluctant to entrust confidential financial details to businesses operating in developing countries that have a weak reputation for rule of law and prosecution of business fraud. One government effort to address security concerns is Singapore's acting Certification Authority (CA), Netrust, which will verify merchant and consumer identities, examine merchants' transaction and security procedures and issue digital certificates to those who comply with standard criteria. Private solutions may also be possible: for instance, websites like Hypermart host (and help build) storefronts for thousands of small- and medium-sized businesses, providing a common secure payments system for all (ITC, 2000).

Since the users of the technology are based locally, they can still practise the traditional modes of conducting business, like the face-to-face 'haggling' approach and by paying by physical cash. What we propose here is giving the businesses a global reach through the Internet technology. As observed by Heeks (2000), some identifiable opportunities presented by the new model can be grouped under two broad categories: south-north and south-south.

Under the first category (South-North), there exist two sub-divisions: Southern Businesses to Northern Consumers (SB2NC) and Southern Businesses to Northern Businesses (SB2NB). Examples of the first sub-divisions (SB2NC) would include tourism and in social trading portals such as PEOPLink; while examples of the second sub-division include the multi-billion dollar trade in software from India that is increasingly ICT-mediated, and other intermediated trade like the UNCTAD Global Trade Point. Put simply, SB2NC is a form of B2C while SB2NB is B2B.

North

Consumer   Business

T
r
a
d
e
r
s

T
N
C
s

Portal/New
intermediary

Key disintermediation
opportunities

Key disintermediation
threats

South

Business   *   Focal Business   Rich Consumer

Unlikely unless
intermediated

NGOs   Government   Poor Consumer
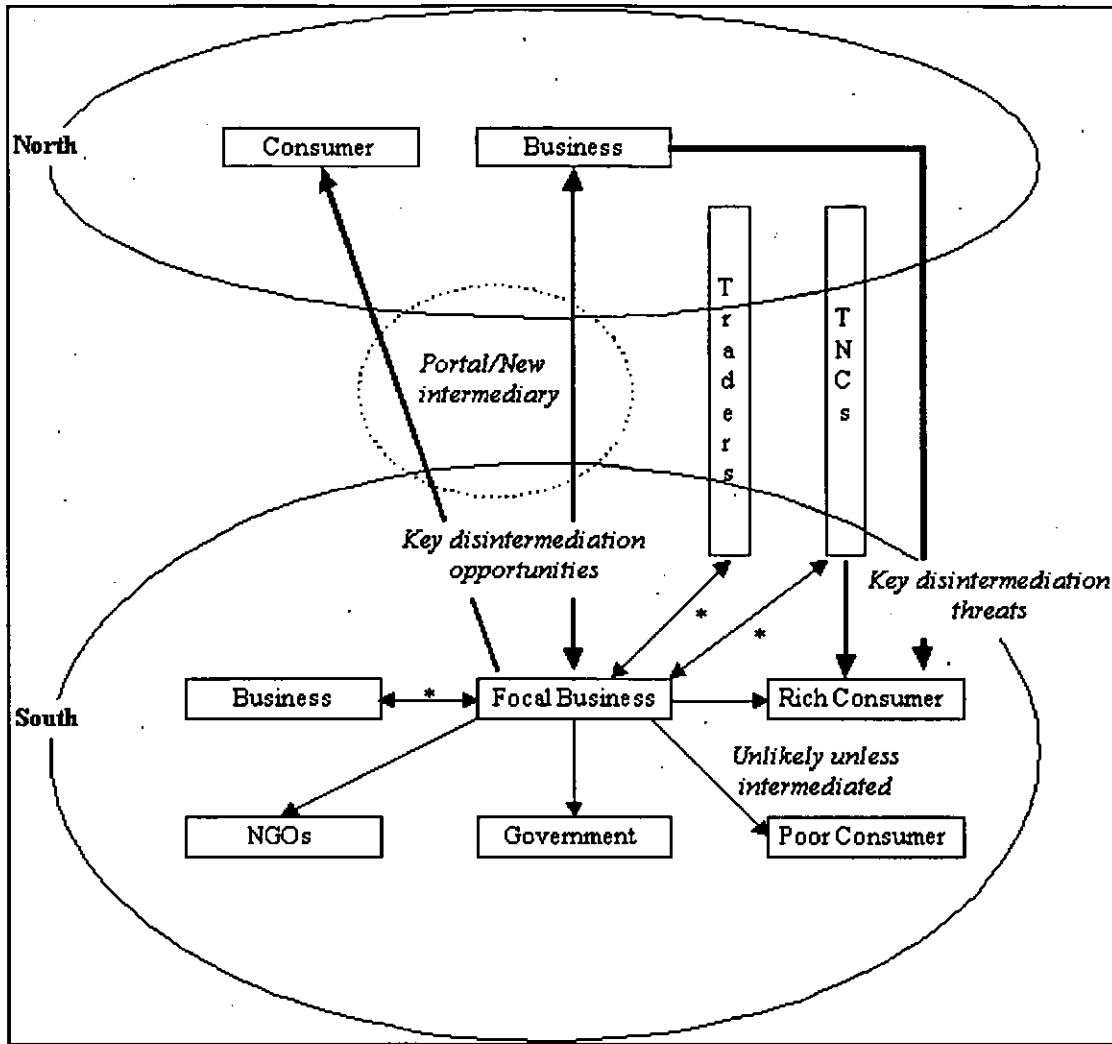
Fig. 5.3: A Conceptual Model of eCommerce and International Trade (Heeks, 2000)

For the South-South category, ecommerce exchanges can be local, national or international. Even so, there are also two sub-divisions for this category. One is the Southern Businesses to Southern Consumers (SB2SC). One very typical example of the intra-country E-Commerce business opportunities is www.refiff.com in India. Then, there is also the Southern Business to Southern Businesses (SB2SB) sub-category. For the SMEs in the south, opportunities exist particularly in the B2B models. Unfortunately, opportunities for the majority of poor women and men to directly use E-Commerce as consumers (B2C) are inhibited by a lot of factors (Networked Intelligence, 2000).

There are however some threats posed by E-Commerce generally manifested in two forms. First, barriers to E-Commerce entry which confront Southern

130

businesses can be found at the micro level (for individual enterprises) and macro level (for national infrastructure and policy). Both enterprise support activities and national/global policy making from the South must become better informed of the new capacities that are required (Singh, 1999).

Secondly, there is the fear that E-Commerce will reverse import substitution (example, replacing SB2SC with NB2SC) more than it will open export opportunities for Southern businesses (Heeks, 2000). While it is advisable that poor countries in these regions must be alive to this threat, they must however not lose sight of the opportunities it provides for their consumers and to the sales/distribution opportunities it provides to their businesses.

5.1.10 Summary

For any model, method or framework to be effective over a wide range of problems, argues Simmons (2005), "it must possess many qualities: flexibility, scalability, portability and learnability, to name a few." In this chapter, we have demonstrated that the *Tradem* business model can be flexible and scalable as it can be used by similar businesses and it does not have any upper limit to the number of small businesses that can participate in it at the a time. Besides, the model is adaptable which means, as Gilb (2005) explains, it has the ability to respond to and cope with feedback and also to keep pace with constant changes in business and organisational requirements.

5.2 Proposed Technological Model

5.2.1 Introduction

In this sub-chapter, we attempt to design the architectural framework of the technological model which is one of the primary aims of the overall project. This model is very important as it will be used in implementing the Business Model outlined in the first segment of this chapter. It also will help in providing a basis for government participation or role in the whole project.

5.2.2 Technological Model

The proposed technological model addresses both technological accessibility (connectivity) and multi-user interface. It has so far been called the *Tradem* model. This model proposes the collaboration of a number of SMEs to form strong working relationships in line with the philosophy of *Isusu* (or ROSCA as discussed in 2.2 of Chapter 2). This is with a view to pooling their meagre resources together in order to exploit the global B2B E-Commerce opportunities. This is also in line with the "Strategic Alliance and Collaboration" initiative suggested by Shemi and Magembe (2003). Furthermore, it follows on the result of our field study which showed that the cost of acquiring and using the Internet formed part of the inhibiting factors affecting small businesses in SSA when attempting to single-handedly adopt new technologies and in particular the Internet in their business transactions.

This *Tradem* model operates on three main levels: Internal, Collaborative (Semi-External) and External as shown in Fig. 5.2.1. It proposes that each participating SME controls some of its core operational and legacy systems at the Internal level while sharing its marketing and other business processes with other participants at the Collaborative level within a virtual private network (VPN). The third level (External) is where the whole group share their products and services with the world through the Internet.

Each of these levels consists of a number of components. The Internal level for instance has 4 components, while the Collaborative and External levels have 5 and 2 components respectively. As shown in Fig. 5.4, the main components of the Internal level are Legacy Systems, Enterprise Resource Planning (ERP), Supply Chain Management (SCM) and Customer Relationship Management (CRM).
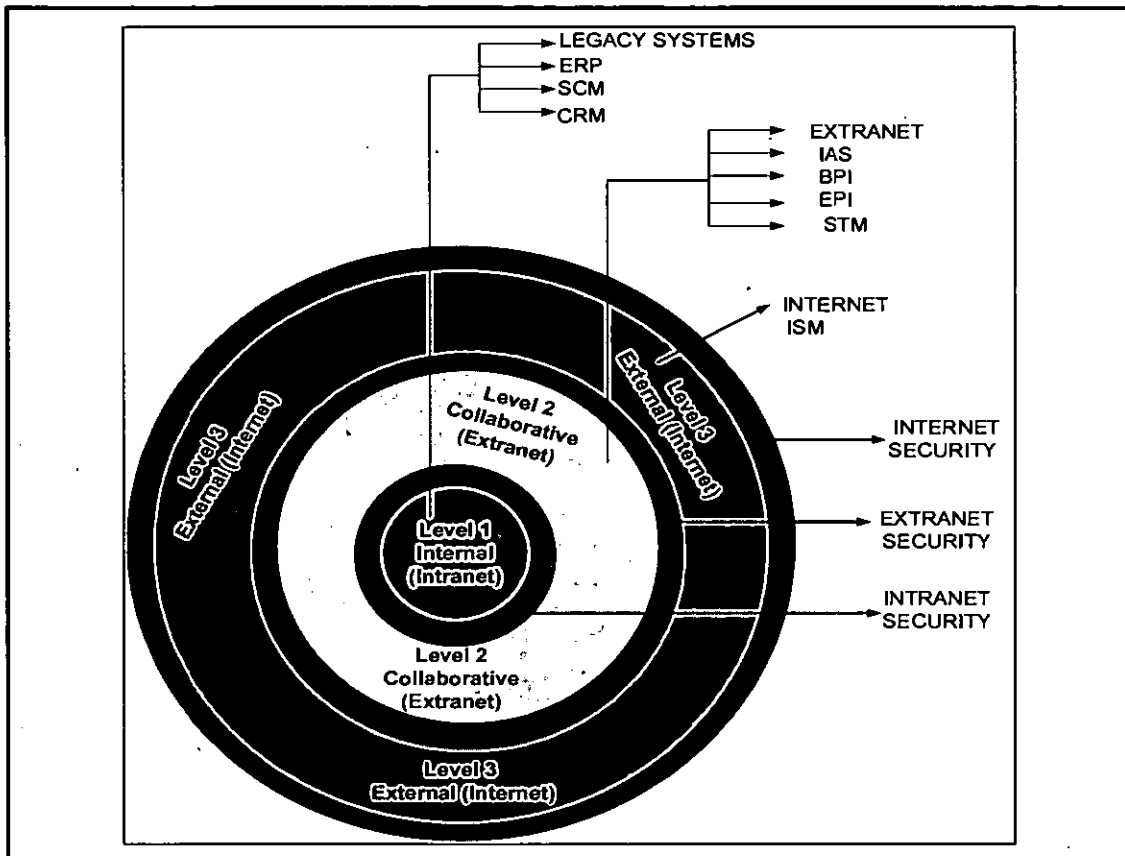
Fig. 5.4: Three Levels and Applications of the *Tradern* Model

At the Collaborative level, there are the Integrated Applications Solutions (IAS) (e.g. Databases and Catalogues); Business Process Integration (BPI), (e.g. Product Development Management Systems (PDMS), Business Model Development (BMD), Business Strategies Development (BSD), etc); and Enterprise Process Integration (EPI), (e.g. Quality Assurance Management (QAM), Human Resources Management (HRM), Customer Relationships Management (CRM), Supply Chain Management (SCM), Risk Management (RM), and Security and Trust Management (STM)). And finally, at the Internet (External) level are the Internet, and Internet Security Management (ISM).

133

The major architectural components of the *Tradem* model are represented in Fig. 5.5. The AKA Group of Artists are being used for the designing of this model. It is envisaged however, that when fully developed, the technology can be used by SMEs offering different products and services. The businesses can operate collectively at both the Collaborative (semi-external) and External levels, while maintaining their individual operations at the Internal level. *Tradem* members will have shared databases and catalogues (and additionally in the case of AKA, Brochures, during joint arts/crafts exhibitions) from where details of their products and services are published on the Internet (using E-Catalogue) and on the Shop front (using hard copy Catalogue). This model will help the participating SMEs to streamline their business activities and to process their business dealings and communications with their customers.
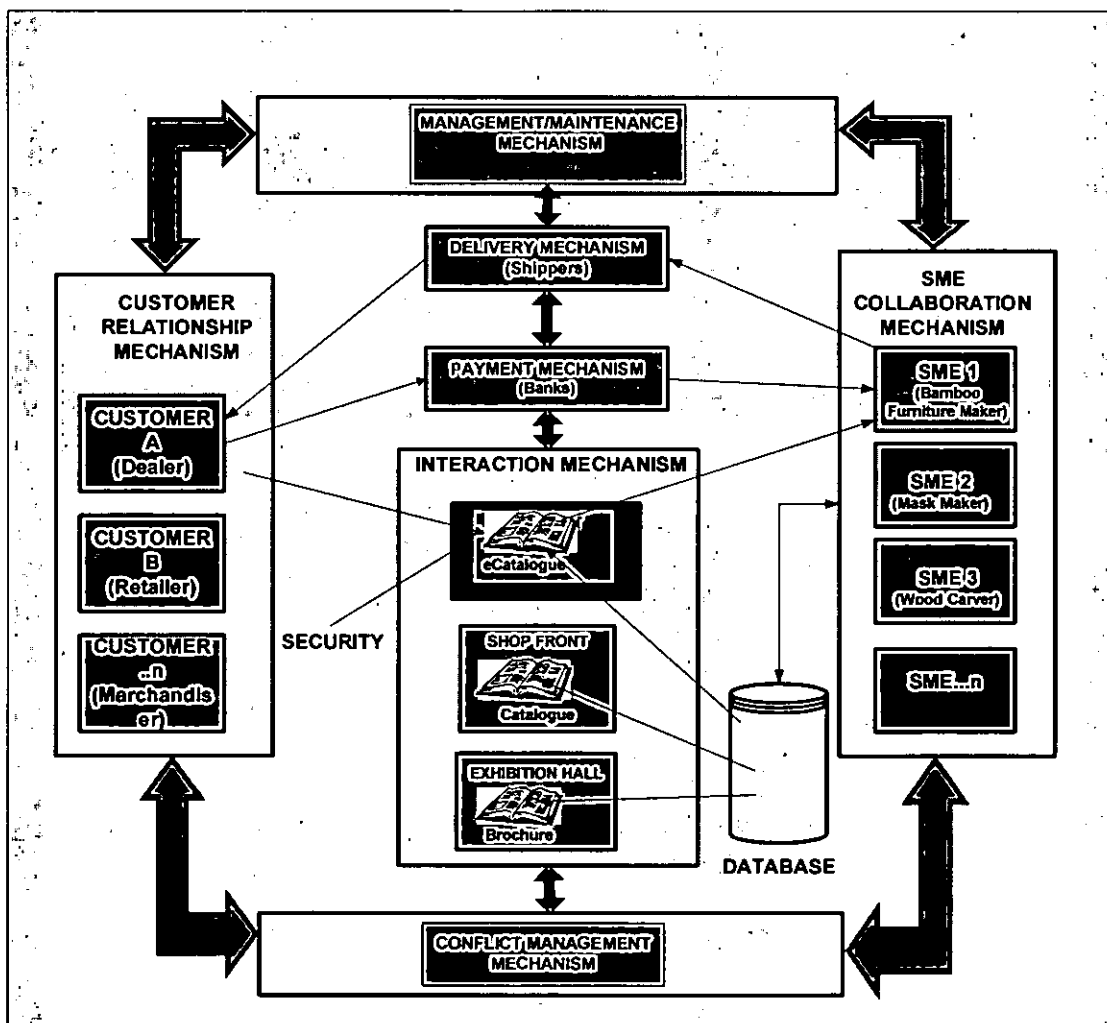
Fig. 5.5: Architectural Overview of the *Tradem* Model

Some of the facilities to be shared include the Integrated Applications Solutions (IAS) and Enterprise Process Integration (EPI) which requires the *Tradern* members to have platforms that are both compatible and interoperable. (Advancement in technology like Cloud Computing has taken care of the compatibility inhibitions). This will be followed by the Business Process Integration (BPI) which will enable the members of the group to know what each other does, what products and services they offer and what their niche markets are. This is very important as it would enable group members to pass on potential customers to others who offer the kinds of products the customers want. It is at this level that common Brochures, Catalogues and Price Indices are defined, described, codified, and price-tagged and produced. All these will take place in the Extranet level and should be characterised by mutual trust and security.

The next level is the External level which provides the point of contact with other businesses as Customers (dealers, buyers or even intermediaries). This is the point at which the Internet platform becomes relevant to the group.

5.2.3 Security and Trust Issues Affecting the Proposed Model

Security has been cited as the number one impediment to the growth of E-Commerce (Greenstein & Vasarhelyi, 2002). From a technological perspective, Laudon & Traver (2005) have identified three key points of vulnerability when dealing with E-Commerce. These are: the client, the server, and the communications pipeline. As shown in Fig 5.4, some of the areas that can be attacked at each major vulnerability point in any E-Commerce transaction include communication channels between one level and the next. It is to forestall this that three levels of Security are built into the system: one between the Internal and the Collaborative levels; another between the Collaborative and the Internet levels; and the third one bothering the Internet and the outside world. The main security issues affecting the proposed model

are not entirely different from those affecting electronic networks generally. Four major security concerns identified by Judge and Ammar (2003) for those involved in E-Commerce transactions are:

      a) Identification and Authentication;
      b) Validation and Authorised Access in Transmission;
      c) Non-Repudiation and Traceability; and
      d) Storage Security and Retention.

According to Laudon & Taver (2005), these security threats can be carried out through a variety of means including malicious codes, hacking and cyber-vandalism, credit card fraud/theft, spoofing, denial of service attacks, sniffing, and insider jobs.

Malicious code (also known as *malware*) includes such threats as viruses, worms, Trojan horses, and "bad applets." Viruses are computer programmes that have the ability to replicate and spread to other files and end up destroying the files or causing programmes to run improperly.

Hacking, which is a form of unauthorised access to a computer system or network, can be done either internally or externally. It can also take place through an individual or a highly organised gang either of whom may attempt to gain access into a computer system or network in order to carry out criminal activities (Jolly, 2003). There are 'varied and complex' motives behind hacking (Duquenoy et al., 2005) including to gain intellectual challenge often seen as being similar to 'solving of elaborate crosswords'. Other motives range from stealing of information or funds, exposing loopholes and vulnerabilities in the system, distributing viruses, modifying data and just for whiling away idle time by making fun.

There is also the denial of service attack which, as reported by the Department of Trade and Industry (DTI, 2002), was used in disrupting a conference of world political and economic leaders in 2002. The hackers had

broken into the conference site the previous year and stole the details of 26,000 delegates attending the conference.

Other security problems include e-theft, netspionage, domain name renewal scams, telecom fraud and identity/credit fraud.

5.2.4 Protecting *Tradern* Model from Security Threats

There are three main levels of security designed to protect the information in the model. These protective mechanisms are designed to protect the internal workings of the individual participating businesses like their legacy systems and their interactions with other small businesses both within and outside of the group. There are also security systems in place to protect the exchanges within and outside the group at the Extranet level. The third tier of security systems are those designed to protect the group website from outside threats.

5.2.5 Systems Compatibility

To achieve compatibility between two or more systems, two mechanisms, standardisation and adaptation can be used (Farrell and Saloner, 1992; Katz and Shapiro, 1994). Standardisation mechanism stipulates that all technologies follow the same specification so that components of various implementations of the adopted solutions are interchangeable. This means that when standards for one system are adopted, the users of that system can communicate directly with the users of other systems. This way, the costs of keeping two systems up to date are saved while at the same time the benefits of network effects are enjoyed.

Adaptation on the other hand occurs when 'adapters' and 'converters' are attached to the components of a system enabling the system to interface with other systems employing other technologies. This results in at least partial compatibility.

5.2.6 Some Anticipated Problems of the Model

One of the envisaged problems with the model is how to get the participating firms to trust each other. For instance, since they share common databases, how would the firms use the systems without mutual suspicion of leaks to external competitors? This problem would be taken care of in two ways: firstly, the Consultants who maintain the technology must protect the trade secrets of the participating firms. Secondly, the technology does not allow for the individual firm's activities at the Internal level to be shared by other participating firms. It is at this level that all the production and branding activities are carried out by the firms. Besides, as one of the AKA group members explained during the Field Study, "we just mind our own businesses when creating our works. And as soon as we submit the created works for joint exhibitions, there is nothing more to hide" (see Obiora Anidi, Transcript D on the attached CD).

There is also the problem of how to avoid the whole set up from being overly bureaucratic. It would be necessary to create a smooth process that would foster smooth participation of the members of the group. There could be a kind of forum (moderated by the consultants) where all members could share their individual and collective concerns and the group can police the activities of the individual members. This model can work without undue bureaucracy provided that the membership is kept to a modest level.

5.2.7 Designing the Web Site

According to Shopfitter (www.shopfitter.com) setting up an E-Commerce website is not too difficult: all one needs is to make a choice from the vast array of software or developers on offer and take the decision about which route to take after comparing and weighing the options. However, marketing the website and processing payments from credit and debit cards causes more confusion and misunderstanding than almost any other part of setting up the site. Making payments for goods and services before or after delivery forms an important part of the business transaction process. In a conventional

business scenario, performing this important function provides a lot of challenges to the person making the payment: does the good or service worth it? Is the money available? What method of paying is more acceptable?

In an online environment these challenges take the added problem of whether what you are paying for is going to be delivered, and if so, will it be according to what you thought it was before making the payment? Furthermore, will a third party intercept your details and use them for something unconnected with deal?

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│        ┌───────────────────────────────────────────┐             │
│        │     E-Commerce Web Site Design Approaches  │             │
│        └───────────────────────────────────────────┘             │
│                          │                                        │
│        ┌─────────────────┴──────────────────┐                    │
│   ┌──────────────┐                  ┌───────────────────┐         │
│   │ Informational/│                  │Online/Transactional│        │
│   │Communicational│                  │    Strategy        │        │
│   │   Strategy    │                  └───────────────────┘         │
│   └──────────────┘                                                 │
│   ┌──────────────────┐            ┌──────────────────────┐         │
│   │ ➤ Brand Awareness│            │ ➤ Brokerage Model     │         │
│   │   and Image      │            │ ➤ Retail Model        │         │
│   │   Building Model │            │ ➤ Mall Model          │         │
│   │ ➤ Cost-Saving    │            │ ➤ Advertising Model   │         │
│   │   Model          │            │ ➤ Subscription Model  │         │
│   │ ➤ Promotion Model│            │ ➤ Community Model      │         │
│   │ ➤ Info-mediary   │            │ ➤ Manufacturer Model  │         │
│   │   Model          │            │ ➤ Customisation Model │         │
│   └──────────────────┘            └──────────────────────┘         │
└───────────────────────────────────────────────────────────────────┘
```
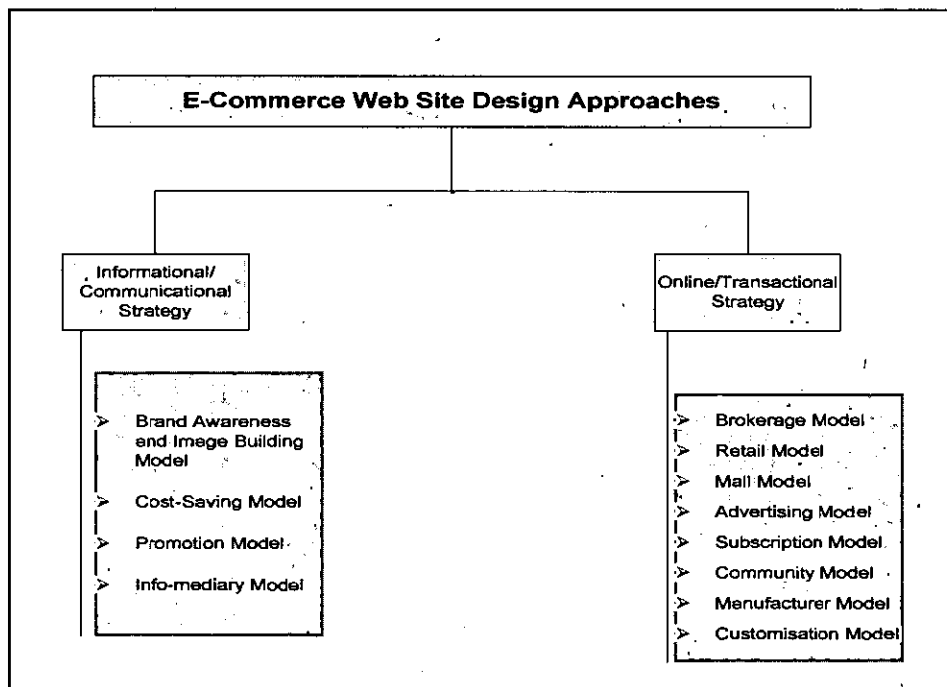
Fig. 5.6: E-Commerce Web Site Design Approaches (Based on *Wen et al., 2001*)

Websites being used for B2B ecommerce implementation should have a number of features that would enhance the trustworthiness of users. Since most traditional trust-enhancing cues in the physical world such as warmth of a shop assistant in offering to help you and the size and layout of the shop floor are not easily recreated in online trading environment (Patton & Josang, 2004) some more affective cues should therefore be adopted. These include (but not limited to) Professionalism of Design, Longevity, Service, Selection, Testimonial (positive anecdotal comments from previous users), Personal

experience, Trust-Assurance indicators (eg presence of known security vendors like VeriSign, etc). There is also the need to avoid Human Computer Interaction (HCI) pitfalls such as Difficult Interface, Poor Navigation and Poor user-friendly designs (Fogg et al., 2001).

Wen et al. (2001) identified two generic Web site design strategies: a) Informational/Communicational strategy; and b) On-line/Transactional strategy (see Fig.5.6). According to them, while the Informational/Communicational strategy uses the Web to support but not to replace a company's main business activities, On-line/Transactional strategy invariably provides an electronic catalogue of the products and services being offered by the company for sale. Some examples of businesses using this model include Amazon.com and Laredoute.com. Visitors browse through the catalogues and order products and services online. It is important to stress however that though the Informational/Communicational design often provides an electronic catalogue as well as ordering information (e.g. by phone, fax, or e-mail), it does not support on-line transaction. Without on-line ordering Web database capability, it hardly exploits the potential of the Web as an interactive medium.

5.2.8 Summary

The technological model of *Tradem* designed in this chapter is a follow-up on the business model designed in Chapter 5.1. It takes into account the findings of our data analyses which showed that SMEs in SSA are willing to participate in E-Commerce if they are satisfied that the technology is secure, trustworthy and cost-effective. We have integrated all these elements, as well as some of the other components as enunciated by Rappa (2004), Weill et al. (2005) and others.

Furthermore, we have incorporated both the traditional and the modern (hence the name: *Tradem*) in the designed model. The idea is to serve two purposes: one is to help those SMEs who have not yet embraced the E-Commerce technologies to do so; the other is to provide the platform for those who wish to conduct their business using both the traditional and the modern ways to continue to do so.

5.3 The Role of Government in the Proposed Model

5.3.1 Introduction

Governments in Africa and other parts of the world play a very crucial role in creating an enabling environment which can support and foster the growth of E-Business. This role can be carried out in various ways; chiefly among them is by establishing good policies in the areas of conflict resolution and legal protection. Establishing a favourable policy environment will greatly facilitate E-Business activities by enhancing business efficiency and facilitating the integration of African countries into the global economy (UNECA, 2006).

Nigerian government using its Nigerian National Policy for Information Technology (NNPIT, 2001) acknowledges that IT is the bedrock for national survival and development which "challenges us to devise bold and courageous initiatives to address a host of vital socio-economic issues such as reliable infrastructure, skilled human resources, open government and other essential issues of capacity building."

5.3.2 Creating the Right Environment

Although the private sector has been widely seen as being the most innovative player and the major driving force behind E-Commerce and ICT deployment (UNCTAD, 2003), the government still has a lot to offer in initiating and implementing national E-Commerce and ICT strategies. One of the major objectives of the Nigerian IT policy is to create an enabling environment that "empowers stakeholders in trade and commerce with the underlying infrastructure to improve productivity and positively position the nation for global competition" (NNPIT, 2001). A conducive and enabling environment for the growth of E-Business cannot be created by governments alone. There has to be a very active participation in the realisation of this objective by other sectors of the economy, particularly those involved in digital economy. An enabling environment for B2B encompasses a lot of issues and prerequisites.

The pre-requisites for an enabling environment, according to (UNCTAD, 2003) include:

- Access to inexpensive, reliable Internet services;

- A legal framework which develops trust in E-Business transactions;

- A financial environment that facilitates technological development at both national and enterprise levels;

- A national education system that provides e-competency;

- E-Government; and

- E-facilitation.

They believe that it is the absence of these prerequisites that has created the digital divide.

5.3.3 Access to Affordable Internet Services

The issue of having access to inexpensive and reliable Internet services is very important as it touches at the very fundamental prerequisites for E-Business activities. The ability to participate in E-Business from the rudimentary level of searching the Web for information to the highly technical level of conducting electronically seamless transactions starts with connectivity. Both the governments and other private-sector operators have a stake in making sure that the accessibility issue is taken care of. This is one of the main objectives of the Nigerian government as enunciated in their National policy (NNPIT, 2001). It states that one way of achieving this is to enact laws which reduce the tariffs and duties imposed by governments on the importation of Internet-related equipment. The government can also engage in partnership arrangements with producers of these technologies in order to set up wireless networks which can guarantee cheap and regular connectivity to the users.

5.3.4 Legal and Regulatory Framework

An 'e-friendly', 'e-ready' enabling legal and regulatory framework is indispensable if a country is to reap the economic and social benefits of E-Commerce and the Internet (Satola, 2002). It is the sole responsibility of governments to make laws. For the E-Commerce practice to win the mass appeal it deserves, enabling laws should be enacted. Areas to be covered by these enabling laws include but are not limited to the removal of paper-based obstacles and others that deal with authentication of electronic records and signatures. There is also the need to streamline and resolve the intellectual property rights (especially the protection of copyrights and trademarks, the detection and punishment of fraud, identity theft, and other digital crimes.

Furthermore, the issues of consumer protection and privacy as well as conflict resolution should be taken care of by the law. In Australia, for instance, the government enacted the *Electronic Transaction Act 1999* which enables online transactions to be regarded as legally valid transactions. Although the act does not specify the kind of authentication technology that will be used, the use of digital certificates is increasingly being seen as a valid form of authentication for enabling and sealing E-Commerce transactions (http://archive.dcita.gov.au/2001/b2b_e-commerce/role).

The law also outlaws such activities as unauthorised accessing of commercial or confidential information, spreading of computer viruses and trading in technologies that are designed to hack into, or damage, another person's computer. In Nigeria, the establishment of the National Information Technology Development Agency (NITDA) in 2001 marked an important milestone in the provision of enabling environment for the growth and development of E-Commerce in the country. Like its Australian counterpart the National Office for the Information Economy (NOIE), NITDA is empowered to nurture Nigeria's ICT activities, including online economy by over-seeing and co-ordinating government policies on E-Commerce, online services and the Internet.

Since E-Commerce transactions are in most cases global and borderless, there is the need for the harmonisation of the various legislations in order to facilitate and foster the global E-Commerce relationships. Developing countries have a pool of existing legislations from the developed countries to draw from and adapt to suit both their local and international jurisprudence. In the UK for instance, one of the laws they can borrow a leaf from is the *Computer Misuse Act* 1990 which attempts to cover international computer crime. Under the act, UK courts can adjudicate over any computer crime as long as the crime has a 'significant link' with the country. As Duquenoy et al. (2005) explain it, "hacking into a computer in Milan from a computer terminal in London is illegal, as is hacking into London from Milan". This therefore means that a person who hacks into a computer in Milan from London can be prosecuted in the UK under this law just in the same way as a person hacking into a London computer from Milan.

Model laws, conventions and regional laws from a variety of sources contribute to the emerging body of international best practices that developing countries can look to for examples in framing their E-Commerce legislative environments (Satola, 2002). This formed part of the thinking which in 1995 resulted in the drafting of the *Model Law on Electronic Commerce* by the United Nations Commission on International Trade Law (UNCITRAL) (www.uncitral.org). This initiative, coupled with the subsequent Draft Rules for electronic signatures was intended to establish a *media-neutral environment* which would ensure equal treatment to users of paper-based documentation (offline contracts) and to users of electronic documentation (online contracts). What governments in developing economies need to do therefore is to adapt these model laws (and indeed, any other international precedent, directive or other precedent law) to suit their legislative environments.

The International Chamber of Commerce (ICC) recognised as *the voice of world business* in its statement at the Okinawa G8 Summit 2000, stated that regulatory standards and solutions should be flexible and be primarily developed by the private sector (ICC, 2000). Also, according to the US

government (http://www.usdoj.gov/criminal/cybercrime/unlawful.htm), governments should establish a predictable and simple legal environment based on a decentralised, contractual model of law rather than one based on top-down regulation. All these submissions imply that the role of governments should be limited to removing obstacles to the expansion of E-Commerce; protecting intellectual property rights in digital environments; and allowing businesses to develop solutions that enhance consumer confidence.

Other areas to be covered by or adapted for B2B E-Commerce laws in developing countries include:

- Intellectual property rights, and particularly the protection of copyrights and trademarks;

- Jurisdiction and dispute resolution;

- Taxation law on Internet-based transactions to prevent tax evasion and to avoid double taxation;

- The obligations of information society service providers;

- Fraud and other e-based commercial crimes;

- Consumer protection; and

- Consumer privacy.

5.3.5 Financial and Technological Development Framework

E-Commerce involves a lot of financial exchanges for goods and services. However, for financial exchanges to take place, security and trust issues have to be addressed. In Nigeria, one of the more progressive fiscal policies has been the consolidation of the banking sector in the country. Introduced in June 2004, the exercise supervised by the Central Bank of Nigeria (CBN) witnessed the reduction of the operating banks in the country from 89 to 25 strong banks that were able to meet the stringent N25 billion (about £100 million) capital base condition imposed by CBN. This consolidation exercise has brought a lot of stability, sanity and trust in the banking sector as well as confidence in the populace. It has also removed the incessant and constant

banking crash and liquidation which had besmeared the reputation of the industry for too long.

Financial institutions like banks and insurance firms play a major role in bringing about secure, safe, accurate and efficient payment systems. Currently in Nigeria, all the 25 banks are developing banking applications, products and services to bring the country in line with the rest of the world. Equally important is the fact that the country's banking systems are now moving to meet the macro-economic convergence target set by the West African Monetary Zone (WAMZ) for December 2009.

More banks in the country are embracing modern banking systems, introducing automated teller machines (ATMs), credit and debit cards, as well as other bespoke products. The First Bank of Nigeria for instance, has introduced such products as *FirstCard, ValuCard* and *Quickland*. Of these products however, the most significant in the implementation of B2B E-Commerce is the *ValuCard* which is also being issued by Union Bank of Nigeria.

Fig. 5.7: ValuCard Issued by some Nigerian Banks

ValuCard represents money on deposit with the issuer, and is similar to a debit card. One major difference between stored value cards and debit cards is that debit cards are usually issued in the name of individual account holders, while stored value cards are usually anonymous. Value card is rechargeable (it can be likened to a recharge gas card in the UK), but is not

147

linked to the account, and cannot be used to make payment online. It can also be used to make payments at Points of Sale (PoS) terminals that carry the ValuCard acceptance sign. The key rule is as an e-purse it must be pre-loaded before it can be used to make payment at merchant locations. It can hold up to a minimum of N16 million (approximately, £64,000.00) and it is a commonly acceptable method of payment for goods and services throughout the country. The card has some benefits which included convenience, security, access to funds, and reduction in cash handling costs (and risks), speed of delivery and so on.

The appropriate use of authentication technologies can prevent fraud and help create the trust level that would make online transactions a lot more popular in SSA. One of the best technologies available for securing online transactions is the public key infrastructure (PKI). It provides authentication, confidentiality, integrity and non-repudiation in online interactions between government, business and the community in a manner that aims to achieve inter-operability and consistency of standards. Governments in SSA should borrow a leaf from the Australian government by setting up the machinery to award and maintain digital certificates which would enable businesses to engage in online transactions with both government agencies and international trading partners.

5.3.6 **Summary**

Government's role is very important to the operation of the proposed model. The government has the full responsibility to make, interpret and enforce laws that guide the implementation of the E-Commerce activities in any society. In SSA, government's roles include also the regulation of the activities of the business people as well as conflict resolution functions in the region. This therefore means that for the proposed model to work in SSA, the governments in the region should contribute their quota in not only creating the enabling environment but also in making sure that those participating in the implementation make good their promises to their customers.

CHAPTER SIX

Model Validation

6.1 Introduction

"Model Verification and Validation (V&V) are very important parts of the model development process if models (are) to be accepted and used to support decision making" (Macal, 2005). Validating a designed model or framework can be performed in many ways. One such approach is the qualitative survey method which usually involves both verification and validation (V&V) of the designed software or model (Andersson and Runeson, 2002). V&V activities are performed during a software (or in our case, model) development project. They are aimed at ensuring that the developed system/model meets the expectations of its customers (Validation) and conforms to its specifications (Verification) (Boehm, 1979). Verification is usually performed by the experts while the end-users (or potential users, in this case the SMEs operating in SSA) are used for Validation. Sometimes, it can be a combination of both the experts and the potential users. This combined approach has been used in this project because we believe it would give more credibility to the project.

The validation exercise in this project sought to find out whether the designed model, if adopted and deployed, would have the capacity to attract more SMEs operating in SSA to participate in E-Commerce. In other words, it was intended to find out if the model can do what it was designed to do.

6.2 Technique

As was the case with the data analyses in Chapter Five, two statistical methods of analysis were used in answering the fifth research question. In all, a total of 12 experts and 10 practising artists (used as potential end-users) were used in the validation exercise. The artists were members of the AKA group of exhibiting artists already discussed in some parts of this project (see for instance sections 5.1.7 of Chapter 5, and 4.2.3 of Appendix 1.1). The

group consists of 13 members. But we had to use only 10 of them as the other three are currently based outside Nigeria.

The experts on the other hand were selected purely on the basis of their expertise in E-Commerce as well as their insight into the project as most of them had given their feedback at the various international conferences during which the researcher discussed some aspects of this project. Some of them were also selected on the basis of their familiarity with the SSA sub continent, especially in the area of IT development in the area.

We designed and administered two different questionnaires for the two groups used in this Validation exercise. The reason for this is twofold. One is the fact that, though the two groups are stakeholders in the designed model, they are playing different roles or have different interests in the model. For the experts, for instance, their interest is to make sure that the model has all it takes to be workable. In other words, they were to verify the model. While the practising artists, as the implementers of the model, needed to find out if the research questions that the model was set out to answer could be properly addressed. The other reason for designing and administering two different questionnaires is because the experts have the theoretical knowledge of the requirements of a model and therefore are more qualified to assess whether the specifications were met. The artists on the other hand, as possible end-users of the model were there to ensure that the implementation of the model would achieve the set objectives.

The questionnaires (see Appendices 5.1 and 5.2) were administered through a combination of the electronic mail (email) and telephone methods. Since all respondents had email access, copies of the questionnaires were sent to them by email. Of the 17 questionnaires sent to the experts via email, 13 were returned. Since one of the returned questionnaires was invalid, the remaining 12 were used for analyses.

For the artists however, less than half of the 10 administered questionnaires were returned via the email system. The rest had to be contacted on the telephone and their responses recorded during the telephone conversations. Some of them could not send their responses via the email system due largely to their 'busy schedules' which meant they did not have the time to return the completed questionnaires. Some others complained about the 'snail speed' and the length of time it took them to send the completed questionnaires due to the small bandwidth of their servers.

6.3 Data Analysis

The data generated from the two sets of questionnaires administered for this section of the project were analysed separately. We used the Descriptive Statistical Method in obtaining the means and other measures with a view to comparing their values with each other, while the Inferential Statistical Method was used which added validity to the descriptive statistical findings. With the obtained values (as contained in Table 6.1), some statistical tests of the hypothesis were carried out using such nonparametric technique as Chi-Square (goodness of fit) test in calculating the p value of the research question measuring them against the significance level of <.05.

Table 6.1: Measures taken from the Respondents' Answers to Questions 5, 6 & 7

Questions for SMEs	N	Min	Max	Sum	Mean	Std. Deviation
Your Willingness to participate in Collaborative B2B	10	1	4	33	3.30	.949
Nigerian SMEs' willingness to participate	10	1	4	31	3.10	1.101
Nigerian SMEs' willingness to share E-Commerce resources	10	1	4	33	3.30	1.059

Three questions (5, 6 and 7) in the questionnaire directly address the issues surrounding the willingness or otherwise of SMEs participating in the collaborative E-Commerce model. There are other questions which focussed on other issues, like the attractiveness of the model to foreign entrepreneurs to trust Nigerian SMEs (Question 4); whether or not the activities in the model

make business sense to the SMEs (Question 2); and whether or not the model is workable (Question 3).

a) Validating the Model using Data from SMEs

Research Question Five:

The fifth research question is: "What effect will adopting a collaborative Electronic Business model have on the level of SME participation in Electronic Commerce in SSA?" The following hypothesis was created based on the question:

Hypothesis Five:

H_0: Adopting a collaborative Electronic Business model will not have any effect on the level of SME participation in E-Commerce in SSA (the mean difference is significant at the $\alpha = .05$ level).

H_5: Adopting a collaborative Electronic Business model will result to an increase in the level of SME participation in E-Commerce in SSA at the $\alpha = <.05$ level.

Table 6.2: Frequency Counts of the 3 Variables from SMEs

Respondent Id	Frequency of Responses after Recoding		
	Willingness to Participate	SMEs' Willingness to Participate	SMEs' Willingness to Share EC Resources
1	1	1	1
2	1	1	2
3	2	1	1
4	1	1	2
5	2	1	1
6	1	2	2
7	1	1	1
8	1	1	1
9	2	2	2
10	1	1	1

In order to test H_5 and to answer the research question, we used the non-parametric technique of Chi-square (specifically measuring the goodness of fit). This technique is appropriate since we were not necessarily interested in measuring or testing for "independence" or "relatedness" of the variables. In order to adequately conduct this test, we had to first of all convert the collected data from Ordinal to Nominal form. This therefore meant that we had

to recode or "weight" the data in which the "Agree" and "Strongly Agree" (and similar) responses would form one group (known as "Yes" and coded "1"), while the "Disagree" and "Strongly Disagree" ones would form another group (called "No" and coded "2").

This meant that the frequencies (scores) registered by each of the two groups were the sum total of the individual components of the group. Table 6.2 contains the "weighted" data generated from the three variables which specifically addressed the issues raised by the Research Question.

After subjecting the data to a Chi Square statistical test for goodness of fit analysis, the results (as contained in Table 6.3) show that the Chi-square values for the three variables are statistically significant as the p value for A = .002; for B = .014; and for C = .002 each of which is less than .05 (p< .05).

Table 6.3: Results of Chi-square Tests

Test Statistics

	Your Willingness to Participate in Collaborative B2B	Nigerian SMEs Willingness to Participate	Nigerian SMEs Willingness to Share E-C Resources
Chi-Square(a)	9.800	6.050	9.800
df	1	1	1
Asymp. Sig.	.002	.014	.002

a 1 cells (50.0%) have expected frequencies less than 5.
The minimum expected cell frequency is 3.3.

The results of the test analysis as contained in Table 6.3 show that with the p values of .002, .014 and .002 respectively for the three tested variables, H_5 is borne out [A = $X^2(1, \underline{N}=10) = 9.800$; B = $X^2(1, \underline{N}=10) = 6.050$]; and C = $X^2(1, \underline{N}=10) = 9.800$].

b) Validating the Model using Data from Experts

The same procedures used in testing the Hypothesis with the data generated from SMEs' responses were also applied for testing the Hypothesis with the data from the Experts. The Verification exercise was designed to answer three key questions: a) Is the model workable? b) Does it make business sense? And c) Does it have the ability to accommodate collaborative use by a collection of small businesses?

The data were recoded as was the case in the SMEs data before being subjected to a Chi-square test analysis. Table 6.4 contains the results of the three variables used in testing this hypothesis. It shows that the hypothesis was borne out as the p values for each of the variables is lower than .05. As was the case with the data generated from the selected SMEs, the Experts' data were analysed using the non-parametric technique of Chi-square (measuring goodness of fit) and was used in determining the level of significance of the mean values.

Table 6.4: Data Collected from the Experts

Test Statistics

	Is the Model Workable?	Do the Processes Make Business Sense?	Does the Model Accommodate Collaborative Use?
Chi-Square(a)	9.375	9.375	6.000
df	1	1	1
Asymp. Sig.	.002	.002	.014

a 1 cells (50.0%) have expected frequencies less than 5. The minimum expected cell frequency is 4.0.

6.4 The Implications of the *Tradern* Model on SME Participation

The fifth Hypothesis (H$_5$) seeks to validate the Model designed in Chapter 5.2. The Model was validated in Chapter 6 using data from two sets of

154

stakeholders: SMEs and Experts. This therefore entails that two different approaches were used in the Validation exercise.

The Experts looked at three important questions regarding the ability of the Model to achieve its set objectives (that is: its ability to be workable; make sense; and provide the basis for multi-user systems). The responses of the Experts were tested using the Chi-square analysis (measuring goodness of fit). The results show that the Model is workable (at the statistical significance of .002); the processes contained the Model make business sense (also significance level of .002); and that the Model can accommodate collaborative use (.014).

The other kind of test involved the SMEs themselves. They were to find out if the Model would be good enough to attract more small business operatives. Like the Experts, the SMEs were also confronted with three main questions (see Table 6.1). The results of the test show that the Chi-square values for the variables used are statistically significant. This therefore means that H_5 has been accepted while the Null Hypothesis which states that adopting a collaborative E-Business Model will not have any effect on the level of SME participation in E-Commerce in SSA was rejected. This also implies that the designed Model has been successfully validated.

6.5 Summary

In this chapter, we have successfully tested Hypothesis H_5 using the data collected from the questionnaires administered to both the Experts and the SMEs (Artists). Altogether, six variables (three each for the two stakeholder groups) were used in testing the hypothesis. Since the significance levels of all the variables used in testing this hypothesis fell below the .05 alpha level, we can conclude that H_0 was totally rejected while upholding H_5 which states that: "Adopting a collaborative Electronic Business model will result to an increase in the level of SME participation in E-Commerce in SSA" (at the $\alpha =$ .05 level).

CHAPTER SEVEN

Conclusion and Recommendations

7.1 Introduction

In this chapter, we summarise and conclude on the procedures, processes and findings of this research project. In all, four surveys were carried out in this project. Starting with the Pilot Study, we went ahead to conduct a fully-fledged Field Study. This was then followed by two different surveys used in the Verification and Validation (V&V) of the designed Model amongst SMEs and Experts.

Table 7.1: Summary of Research Questions and Findings

1. What effect will a reduction in the Cost of conducting Electronic Business have on the level of SME participation in E-Commerce in SSA? Cost is very important in considering whether or not to use Electronic Commerce by SMEs. There is a statistical relationship between the Cost of adopting EC and the level of SME participation in E-Commerce. The result of the test shows that more SMEs would like to participate in online business if the Cost of doing so is reduced.
2. What effect will an increase in the Trust level of conducting Electronic Business have on the level of SME participation in E-Commerce in SSA? Trust is directly proportional to the level of SME participation. The statistical test result shows that more SMEs would be willing to participate in E-Commerce if the Trust level increases.
3. What effect will an increase in the level of Security of Electronic Business have on the level of SME participation in E-Commerce in SSA? The issue of Security, from the data collected, seems to be the most important consideration for SMEs in their decision to participate in E-Commerce. The difference of the total scores on the variables measuring Security is 265; while for those of Trust and Cost are 217 and 185 respectively. The high score registered for Security is indicative of the level of importance SMEs attach to the issue.
4. What effect does Culture have on the level of SME participation in E-Commerce in SSA? It is interesting that in spite of the national Culture of 'Face-to-Face' trading in SSA, SMEs are still willing to participate in E-Business which is mainly conducted in the virtual realm with little or nothing known about their customers. This is one of the main findings of this research. Also, the research result has shown that SMEs are also willing to participate in a Collaborative E-Business Model in line with the Culture of *Isusu* (Bouman, 1994).
5. What effect will adopting a Collaborative Electronic Business Model have on the level of SME participation in E-Commerce in SSA? The result of the Validation has shown that more SMEs are willing to participate in the *TRADERN* Collaborative E-Business Model if such technology is available. Furthermore, they are willing to share some of the facilities supporting the Model, like a joint Database.

We used non-parametric statistical methods in testing the hypotheses. The summary of Research Questions and their corresponding findings are contained in Table 7.1.

7.2 Contributions to Knowledge

The result of this research will help in filling a void in the academic literature. The research extends previous theoretical work and empirical results on collaborative B2B, such as those provided by Rappa (2004) and Osterwalder et al. (2002).

We have clearly identified and designed a more inclusive and elaborate E-Business Taxonomy showing the various components of E-Business. In our Taxonomy, we clearly defined the distinctions between E-Commerce, E-Government, Tele-Medicine and E-Learning.

The issues of Cost, Trust, Security, and Culture as they influence participation in E-Commerce have been very extensively investigated. We now know conclusively how each of them affects the decision of SMEs in SSA to deploy and implement E-Business technologies.

In more concrete terms, we have developed, designed and validated the *Tradem* Models (both business and technological). These are new contributions as they have not been developed before. The Business Model will help small businesses not just in SSA but in the other developing economies in transforming their business culture and in taking advantage of the opportunities offered by E-Commerce. Implementing the technological Model will help small businesses in SSA to attract more global businesses as more foreign businesses will be more willing to enter into business relationships with those participating in the Model than individual SMEs operating on their own.

This study has also gone a step further by fully identifying and describing the roles the intermediating institutions like governments, banks, consultants and shippers can play in the overall implementation of the *Tradem* Model. In doing so, we have been able to define the relationships between these intermediaries and the SMEs participating in the Model. The thesis has also contributed to the growing body of knowledge in the area of stakeholder responsibilities and benefits by assigning functions to each of the intermediating institutions.

Furthermore, we have successfully demonstrated that Culture (especially as it is being practised in SSA region) is not antithetical to E-Commerce practices. *Tradem* has shown that the business Culture of 'Face-to-Face' trading can have a harmonious co-existence with modern forms of conducting business without the business progress and growth being hampered. This is very important as SMEs in SSA and other cultures can now combine and apply both methods simultaneously in their businesses.

The *Tradem* Model will also provide the needed transition for the SMEs in SSA to migrate their businesses to modern E-Commerce formats without putting their business growth and survival in jeopardy. In fact, small businesses in developing countries can now make this very important transition without destroying their business cultural legacy and heritage.

The Model can also be deployed by other businesses in the other branches of E-Business. The Governments for instance can use *Tradem* in establishing such E-Government practices as government to business (G2B), government to consumers (G2C) and even government to government (G2G) as well as other government-oriented business relationships.

One other very important contribution of the *Tradem* Model is the empowerment of SMEs. For the first time, SMEs can be in control of their

business relationships with others businesses (local or international) without huge financial implications as the cost of maintaining these relationships are shared by those participating in the Model. Besides, there is no role for middlemen who make their living by positioning their businesses between the SMEs and their customers.

Still on the issue of empowerment, with the *Tradem* Model, SMEs in SSA and other developing countries have been equipped with the appropriate E-Commerce technology that will lead them ultimately to real and sustainable growth and development. We believe that if these small businesses can leverage their E-Commerce potential using *Tradem* Model, they will contribute enormously to poverty alleviation and economic development of their communities. These will contribute to the achievement of the UN MDG goals.

7.3 Significance of the Study

The *Tradem* Model will be beneficial to the stakeholders. The stakeholders in this model include the government, SMEs, consultants, banks, academics, shipping agents, citizens of these developing countries as well as the world in general. For the SMEs, it is envisaged that adopting and implementing this model will drastically reduce their transaction costs, while at the same time increase their efficiency and profit margins. This will be achieved through having greater freedom to streamline their business activities and to process the communications with their customers. The model also will bring about enhanced quality and competitive goods and services to the SMEs which adopt it.

Furthermore, since the human resource management (HRM) functions of the group would be handled by a member of the group (see Consultants in Fig. 5.2.2), we believe that there will be a marked improvement on the quality of new recruits as the consultants will only hire people who are suitably qualified for the jobs. This is very important because, as Mason et al. (1996) and Prais

159

(1995) observed, the supply of appropriately skilled labour is key to the success of a firm's quality strategies and the effectiveness of its management system.

It is also envisaged that there would be a more efficient, cost-effective and result-oriented way of conducting in-house training to enhance both the human resource development of the staff and help group members meet their challenges and competences. The net effect would be increased employee job satisfaction and improved morale, as well as efficiency and productivity which in turn would result to growth of the businesses in the group (Bartel, 1994; d'Arcimoles, 1997).

To the governments in the regions, there will be the need for policy formulation to reflect the realities of conducting business online for SMEs. The issues of taxation and legislative process will be streamlined with the modern online business practices. There will be increased revenue through taxes, tariffs, etc, as well as stronger economies. There will also be more employment opportunities; more profits for vendors of communication, software and hardware technologies; more social amenities, more quality lifestyles, health, learning, cheaper and more quality goods and services, etc.

In a buyer-oriented marketplace, buyers will be able to buy quality goods and services from around the world. Suppliers also benefit from the extended geographical market reach and the lower sales and marketing costs. Also, by improving the productivity of bidding and sales activities, and by reducing the selling cycle time, sales are boosted (Malenski, 2000; Liebman, 2001; Miles et al., 1994). The customers will enjoy assured security and trust since they know that they are dealing with genuine, trusted and reliable group of operators. This will help in developing trust which will grow, over time, into the creation of credit facilities, etc.

The issue of trust is fundamental to the success of the whole set up. It is the foundation of E-Commerce (Keen et al., 2000). Trust involves having confidence in the other parties, and hence having an expectation that the risks will not result in loss (Clarke, 2002).

Yee (2001) gives some of the features that lead to trust as: competence, credibility, integrity, benevolence and communication. Trust also creates a smooth process that would in turn foster smooth participation, policing the activities of the individual member of the group, avoiding bureaucracy in the systems and reducing the over-reliance on technology.

The higher the trust, the more the customer loyalty, as experience is a factor to increase trust in new products and services. It is our expectation that the E-Commerce market would more readily trust this model over time than they would trust an individual SME operator.

Over and above all others however, there is the benefit of a level-playing field which the SMEs in developing economies, like Africa, can capitalise on to leapfrog, improve and sustain their economic development and global E-Business participation.

7.4 Limitations of the Study

One major limitation is the fact that we could not carry out a real-life demonstration of the Model during the Validation exercise. This therefore meant that the respondents relied on both illustrations and descriptions of the components and workings of the Model before validating it.

There is also the limitation of the sample size in terms of the number of respondents as well as the geographical spread of the Field Study. In total

122 respondents selected from 3 Nigerian cities of Abuja, Lagos and Enugu were used. Had the resources been available, more samples from more cities from the SSA region would have be been selected in order to make the study more representative.

7.5 Recommendations for Further Research

It is recommended that more research should be conducted on the Model with a view to finding out how more SMEs can benefit from the Model. There is also the need for further studies on how other small businesses in the Asian Pacific nations (and indeed, other developed nations) can exploit the benefits of the Model in expanding their businesses.

Furthermore, further studies should explore the possibility of integrating Supply Chain Management mechanism (SCM) in the model. This would need a functioning collaboration in order to exploit the advantages of bulk purchasing, etc.

As has been shown in our study, we have established that a change in the levels of the factors affected the levels of participation. Another study can go further to determine the exact impact of each of the factors on the decision-making process of the SMEs.

References

Adam, L. (1996) "Electronic Communications Technology and Development of Internet in Africa", *Information Technology for Development*, Vol. 7, pp. 133-144.

Adam, L.(1996a). "African Connectivity, Problems, Solutions and Actions: Some Recommendations from Inet'96", URL: http://www.africa.upenn.edu/Global_Comm/afr_inet96.html. (Accessed on 10/04/06).

Afuah, A.., and Tucci, C., (2001). *Internet Business Models and Strategies,* Bolton, McGraw Hill.

Alampay, G., (2007). "The Role of Governments in Promoting ICT Access and Use by SMes", published at: http://www.apdip.net/apdipenote/12.pdf (Accessed on10/12/08).

Ali-Dinar, A.B. (1995). "Expert Group Debates Strategy for the African Information Society", *PADIS Newsletter,* Vol. 10, No. 2, 1995.

Amit, R., and Zott, C., (2001). "Value Creation in eBusiness", *Strategic Management Journal,* Vol. 22, 2001, pp. 493-520.

Anderson, D.R., Sweeney, D.J., & Williams, T.A. (1993). *Statistics for Business and Economics,* West Publishing Co, 5th Edition.

Aniebonam, M. C. (2003), "The Future Generation of Global Information and Communication Technology (ICT): Can Africa Meet the Challenge?", *Chimera,* Vol. 1, Issue 2/Summer 2003.

Ariyo, D., (2000). "Small Firms are the Backbone of the Nigerian Economy", *African Economic Analysis,* 2000, URL:http://www.afbis.com/analysis/small.htm. (Accessed on 24/07/05).

Austin, J. E. (1990) *Managing in Developing Countries: Strategic Analysis and Operating Techniques.* New York: Free Press.

Avgerou, C. (2002), "Information Systems and Global Diversity", Oxford University Press.

Avgerou, C., Ciborra, C., Cordella, A., Kallinikos, J., and Smith, M. (2005). "The Role of Information and Communication Technology in Building Trust in Govern ace: Toward Effectiveness and Results", Inter-American Bank, Washington, D.C.

Baba, M. (1995). "The Cultural Dimensions of Technology-enabled Corporate Transformation". *Technological Innovation and Cultural Processes: New Theoretical Perspectives.* M.J. Santos and R.D. Crus, eds: Mexico City: National University of Mexico.

Bambury, P. (1998). "ATaxonomy of Internet Commerce," *First Monday,* Issue 3.10 (1998).

Barbour, R.S., Featherstone, V.A. and members of WoReN (2000) "Acquiring Qualitative Skills for Primary Care Research: Review and Reflections on a Three-stage Workshop. Part 1: Using Interviews to Generate Data", *Family Practice,* 17(1): 76-82.

Barlett, M. (2001) "B2B Increases as Traditional Companies Embrace Technology (Industry Trend or Event)", Newsbytes, Jan 31/2001.

Bartel, A.P. (1994), "Productivity Gains from the Implementation of Employee Training Programs", *Industrial Relations,* Vol.33 No.4, pp.411-425.

Beaubrun, R., and Pierre, S., (2001) "Technological Developments and Socio-Economical Issues of Wireless Mobile Communications", *Telematics & Informatics,* 18(2001), pp. 143-158.

Bertolotti, D.S. (1984). *Culture and Technology.* Bowling Green, Ohio: Bowling Green State University Popular Press.

Best, M.L., and Maclay, Colin M., (2002) "Community Internet Access in Rural Areas: Solving the Economic Sustainability Puzzle", http://www.cid.harvard.edu/cr/pdf/gitrr2002_ch08.pdf (Accessed on10/03/04).

Bhaskaran, K.; Chung, J.; Heath, T.; Kumaran, S.; Das, R.; and Prabir N., (2001) IEEE Third Int'l Workshop Advanced Issues of E-Commerce and Web-Based Information Systems (WECWIS'01) 2001.

Bhatnagar, S. (2003), "Development and Telecommunications Access: Cases from South Asia", pp.33-52. in Avgerou, C. and La Rovere, L.R. (eds.) *Information Systems and the Economics of Innovation.* Edward Elgar Publishing.

Biggs, T., and Shah, M.K., (2006). "African SMEs, Networks, and Manufacturing Performance", *Journal of Banking & Finance,* Vol. 30, Issue 11, November 2006, pp. 3043-3066.

Bouman, F.J.A. (1994) "ROSCA and ASCRA: Beyond the Financial Landscape", in: Bouman, F.J.A. and O. Hospes (eds.), *Financial landscapes reconstructed. The fine art of mapping development,* Boulder: Westview Press, 1994, pp. 375-394.

Bowman, B., (2002) "Wireless Choices: Networking Technologies and Windows XP", url: http://www.microsoft.com/windowsxp/using/networking/expert/bowman_02september03.mspx. (Accessed on 03/02/06).

Bowman, B., (2005) "How to Secure Your Wireless Home Network with Windows XP", http://www.microsoft.com/windowsxp/using/networking/learnmore/bowman_05february10.mspx (Accessed on 03/02/06).

Bryant, A., & Colledge, B., (2002) "Trust in Electronic Commerce Business Relationships", *Journal of Electronic Commerce Research,* Vol.3, No. 2, 2002.

Burkert, H. (1994) "Electronic Trust and the Role of Law: A European Perspective", in K. Brunnestein and E. Raubold (eds.), *Applications and Impacts – Information Processing '94* (Proceedings of the 13th *World Computer Congress,* Hamburg, Germany, 28 August – 2 September), Vol II, North Holland: Elsevier.

Burns, R.B. (2000), "Introduction to Research Methods", SAGE Publications.

Chen, S.C, & Dhillon, G.S., (2003) "Interpreting Dimensions of Consumer Trust in E-Commerce". *Information Technology and Management*, Volume 4 , Issue 2-3 (April-July 2003) , Pages: 303 – 318.

Chesbrough, H., & Rosenbloom, R.S., (2002). "The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spinoff Companies", *Industrial and Corporate Change* Voll.11, No.3, pp. 529-555).

Clarke, R. (2000), "Appropriate Research Methods for Electronic Commerce", Xamax Consultancy Pty Ltd, url: http://www.anu.edu.au/people/Roger.Clarke/EC/ResMeth.html. (Accessed on 12/01/05).

Clarke, R. (2002) "e-Consent: A Critical Element of Trust in E-Business", in 15th Bled Electronic Conference, Slovenia, June 17 -19, 2002.

CNNIC, (2006). "18th Statistical Survey Report on the Internet Development in China", published at: http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN0245 76.pdf. (Accessed: 07/03/07).

Coakes, S., Steed, L., & Dzidic, P. (2006). *SPSS 13 for Windows: Analysis without Anguish*. Wiley.

Collin, S. (2000) "Work the Web: E-Marketing", John Wiley & Sons Ltd, 2000.

Cornford and Smithson (1966) "Project Research in Information Systems: A Student's Guide", Palgrave, 1966.

Corritore, C.L., Kracher, B., & Wiedenbeck, S. (2001). "Trust in the Online Environment", in Smth et al (Eds.), *Usability Evaluation and Interface Design: Cognitive Engineering, Intelligent Agents and Virtual Riality*, Mathway, NJ: Erlbaum.

Cunningham, Michael J. (2001) "B2B: How to Build a Profitable E-Commerce Strategy", Pearson Education Limited, 2001.

CURDS (2000), The E-Commerce Revolution and its Impact on Firms, Premises and Business Location in the West Midlands, Centre for Urban and Regional Studies, University of Birmingham, Birmingham.

Czerniawska F., and Potter G. (1998) *Business in a Virtual World: Exploring Information for Competitive Advantage,* Macmillan Press, Basingstoke, 1st ed, 1998.

Dai, Q., and Kauffman, R.J., (2001). "Business Models for Internet-Based E-Procurement Systems and B2B Electronic Markets: An Exploratory Assessment", *Proceedings of the 13th Hawaii International Conference on Systems Sciences,* 2001.

Dasgupta, S., Lall, S., and Wheeler, D., (2005). "Policy Reform, Economic Growth and the Digital Divide", *Oxford Development Studies,* Vol. 33, No. 2, June 2005.

Davies, M., Babar, K., Asutosh, P., and Deepak, G., (2001). "Developing a Sustainable Business Model for SARI." McKinsey & Company (Delhi) Report to the SARI Project, 15 May 2001.

Deelmann, T., and Loos, P., (2002) "Trust Economy: Aspects of Reputation and Trust Building for SMEs in E-Business", Eight American Conference on Information Systems, 2002, pp.2213-2221.

Denscombe, M. (2003). The good research guide for small-scale social research projects. (2nd ed). Glasgow: Open University Press.

Doeringer, P.B., and Terkla, D.G. (1995) "Business Strategy and Cross-Industry Clusters." Economic Development Quarterly, 9:225-37.

DTI (2001) available at: http://www.dti.gov.uk/SME4/define.htm (Accessed on 08/07/05).

DTI, (2002). "Information Security Breaches Survey 2002", in: Jolly, A. (ed) The Secure Online Business: E-commerce, IT Functionality & Business Connectivity. Kogan Page, 2003.

Duncombe, R., Heeks, R., Kintu, R., Nakangu, B., and Abraham, S. (2005) "eCommerce for Small Enterprise Development: A Handbook for Entrepreurs in Developing Countries", Institute for Development Policy and Management (IDPM), 2005.

Duquenoy, P., Jones, S., Rahanu, H. & Diapar, D. (2005). Social, Legal and Professional Issues of Computing, Middlesex University Press.

Dutta, A. (1997) "The Physical Infrastructure for Electronic Commerce in Developing Nations: Historical Trends and the Impact of Privatization," International Journal of Electronic Commerce (2) 1, pp. 61-83.

Esselaar, P., and Miller, J. (2001) "Towards Electronic Commerce in Africa: A Perspective from Three Country Studies", Southern African Journal of Information and Communication, Vol.2 No.1, 2001.

Farrell, J., and Saloner, G., (1992). "Converters, Compatibility, and the Control of Interfaces", Journal of Industrial Economics, 40:1, March 1992, pp. 9-35.

Feldman, S., (2000), "The Changing Face of E-Commerce: Extending the Boundaries of the Possible", IEEE Internet Computing Online, May-June, pp82-83.

Field, A. (2005). Discovering Statistics Using SPSS. Sage Publications Ltd, 2nd Edition.

Fleenor, C.P., and Raven, P., (2003) "Barriers to Effective E-Business in Developing Countries", Institute for Global E-Business (IGBI), Seattle University, USA, 2003.

Fogg, B.J., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., Jvoti, P., Ragnekar, A., Shon, J., Swani, P., & Treinen, M. (2001), "What makes Web sites credible? A report on a large quantitative study", Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, p.61-68, March 2001, Seattle, Washington, United States.

Foley, P., and Ram, M., (2004), The Use of Online Technology by Ethnic Minority Businesses: a Comparative Study of the West Midlands and UK, Monograph, De Montfort University, Leicester, available at www.sbs.gov.uk/content/research/EMB_IT.pdf, quoted in Taylor M and

Murphy A (2004), SME's and E-Business, *Journal of Small Business and Enterprise Development*, Vol 11, No 3, pp 280-289.

Fraumeni, B.M., Manser, M.E., and Mesenbourg, T.L., (2000), "Government Statistics: E-Commerce and the Electronic Economy", available at: www.census.gov/econ/www/ecomm2.htm, (Accessed on 15/08/05).

Gefen, D. (2000). "E-Commerce : The Role of Familiarity and Trust". *Omega* 28: 725-737.

Gereffi, G., and R. Kaplinsky (eds) (2001). 'The Value of Value Chains: Spreading the Gains from Globalization'. *IDS Bulletin*, 32 (3).

Gholami, R., Moshiri, S., and Lee, S.T. (2004) "ICT and Productivity of the Manufacturing Industries in Iran", *Electronic Journal on Information Systems in Developing Countries,* Vol. 19, No. 4, pp.1-19.

Gilb, T., (2005). *Competitve Engineering: A Handbook for Systems Engineering, Requirements Engineering, and Software Engineering using Planguage,* ISBN 0750665076, 2005, Publisher: Elsevier Butterworth-Heinemann.

Gittins, Robert, (2001), "Qualitative Research: An Investigation into Methods and Concepts in Qualitative Research", url:

Glaser, B.G. & Strauss A.L. (1997) "The Discovery of Grounded Theory: Strategies for Qualitative Research", Aldine, 1997.

Godwin-Jones, Bob (2002), "Emerging Technologies: Wireless Networks", *Language Learning & Technology,* Vol.6, No.1, pp. 6-10.

Goldstein, A., & O'Connor, D. (2000) "E-Commerce for Development: Prospects and Policy Issues, in OECD Development Centre Technical Paper No. 164. url: http://ipc-lis.mit.edu/globalization/E-commerce.pdf. (Accessed on23/03/04).

Goodman, S.E., & Green, J.D., (1992). "Computing in the Middle East", *Communications of the ACM,* Vol.35, Issue 8, August 1992.

Gordijn, J., Akkermans, J., and Van Vliet, J., (2001). "Designing and Evaluating E-Business Models", *IEEE Intelligent Systems,* July/August 2001. Vol. 16, No. 4, pp. 11-17.].

Grabner-Krauter, S. (2002) "The Role of Consumers' Trust in Online-Shopping", *Journal of Business Ethics,* Vol. 39, Nos. 1-2, August 2002.

Grameen Communications (1998) Grameen Village Internet Programme. Grameen Bank, Bangladesh.

Greenstein, M. & Vasarhelyi, M. (2002). "Electronic Commerce: Security, Risk Management, and Control". McGraw-Hill.

Groeschl, S. and Doherty, L. (2000). "Conceptualising Culture", *Cross Cultural Management,* Vol. 7, No. 4.

Guba and Lincoln (1985), In Denzin and Lincoln (1994), *Handbook of Qualitative Research,* SAGE Publications Ltd.

Haag, S., Cummings, M., and Phillips, A., (2007). *Management Information Systems For the Information Age.* McGraw-Hill/Irwin.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). "Multivariate Data Analysis", Prentice-Hall International.

Hamel, J., Dufour, S., & Fortin, D. (1993). *Case Study Methods*. Newbury Park, CA: Sage Publications.)

Hanson, Ward (2000) "Internet Marketing", South-Western College Publishing, a division of Thomson Learning: Cincinnati, OH, 2000.

Hasan, H., and Ditsa, G. (1999). "The Impact of Culture on the Adoption of IT: An Interpretive Study". *Journal of Global Information Management*, Vol.7 No. 1, pp. 5-15.

Heeks, Richard, "Analysing eCommerce for Development", 2000, url: http://www.e-devexchange.org/eComm/diecomm.htm.   (Accessed   on 21/07/05)

Hirschheim, R. (1992) "Information Systems Epistemology: An Historical Perspective", in Galliers, R. (Ed), *Information Systems Research: Issues, Methods and Practical Guidelines*, Blackwell Scientific, Oxford, 28-60.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-related Values*. Beverly Hills: Sage.

Hofstede, G. (1983). "The Cultural Relativity of Organisational Practices and Theories", *Journal of International Business Studies*, Fall, pp; 75-92.

Hofstede, G. (1994) "Cultures and Organisations, Intercultural Co-operation and its Importance for Survival, Software of the Mind", McGraw-Hill International, UK.

Hsiao, R. (2001). "The Adoption Difficulty of B2B E-Commerce in Asia", *Journal of Strategic Information Systems*, 2001.

IDA (2000). "A Proposed Framework on Building Trust and Confidence in Electronic Commerce", A Consultation Paper, September 2000, available at: http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN0048 53.pdf, (Accessed on 09/09/05).

IDA (2001). "A Framework on Building Trust and Confidence in Electronic Commerce: Summary of Findings and Follow-Up to Industry Consultation", February   2001,   available   at: http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN0020 17.pdf. (Accessed on 20/11/05).

Ike, Obiora F. (2004) "Micro Credit Financing: Positioning Micro, Small and Medium Scale Enterprises (MSMEs) for the Challenges of Globalisation", in: Onah, J.S., Nwosu, I., & Ocheoha, O., (eds.), *Empowering Small and Medium Scale Enterprises in Nigeria*, ECCIMA/Manmark Associates Ltd, 2004.

ITU (2002) URL: http://www.itu.int/ITU-D/ict/publications/world/world.html (Accessed on 17/06/05).

ITU (2003) "ITU Digital Access Index: World's First Global ICT Ranking", International   Telecommunication   Union,   posted   at: www.itu.int/newsarchive/press_releseases/2003/30.html   (Accessed   on 16/04/05).

ITU (2004) "World Telecommunication Indicators Database," International Telecommunication Union posted at: URL: http://www.itu.int/ITU-D/ict/publications/world/world.html (Accessed on 17/06/05).

ITU (2007) "Telecommunication/ICT Markets and Trends in Africa", posted at: URL: http://www.itu.int/ITU-D/ict/statistics/material/af_report07.pdf (Accessed on 08/12/08).

Jacobs, Dany and DeMan, Ard-Pieter, (1996) "Clusters, Industrial Policy and Firm Strategy: A Menu Approach", Technology Analysis and Strategic Management, 8(4), 1996'.

Jayaram, A., Shekar, M., and Rana, A. (1997), "Is India ready for the Net?", Business World, August 22.

Jensen, M. (1999) Continental Connectivity Indicators. Association for Progressive Communications.

Jensen, M. (2002) "Information & Communication Technologies (ICTs) Telecommunications, Internet and Computer Infrastructure in Africa", url: http://www3.sn.apc.org/africa. (Accessed on 07/10/06).

Jolly, A. (2003), "The Secure Online Business: e-Commerce, IT Functionality & Business Continuity". Kogan Page.

Judge, P., & Ammar, M, (2003). "Security issues and solutions in multicast content distribution: a survey", Network, IEEE, Vol. 17, Issue 1.

Katz, M.L., and Shapiro, C., (1994). "System Competition and Network Effects", Journal of Economic Perspectives, 8:2, Spring 1994, pp. 93-115.

Kettinger W and Hackbarth G, (2004, Integration of Electronic Commerce Networks into the Sales Processes of Small Firms, Journal of Electronic Commerce Research, Vol 5, No 3, pp 153-171.

Khalil , Moshen, (2003) "The Wireless Internet Opportunity for Developing Countries", Edited by The Wireless Internet Institute, World Times Inc., 2003, pp/1-4.

Korpela, M., (1996). "Traditional Culture or Political Economy? On the Root Causes of Organisational Obstacles of IT in Developing Countries", Information Technology for Development, Vol7:1. pp. 29-42.

Kransberg, M. and Davenport, W. (1972). Technology and Culture: An Anthropology. New York: Schocken Books.

Kuttainen, C. (2005) "The Role of Trust In B2B Electronic Commerce – Evidence from Two e-Marketplaces", Doctoral Thesis, Lulea University of Technology: ISSN:1402-1544|ISRN: LTU-DT.

La Rovere, R.L. (2003), "ICT Adoption in SMEs: Lessons from Case Studies", pp.89-100. in Avgerou, C. and La Rovere, R.L. (eds.) Information Systems and the Economics of Innovation. Edward Elgar Publishing.

Laudon, K., & Traver, C. (2005). E-Commerce: Business, Technology, Society. Boston: Addison-Wesley.

Leblois, A., (2004) "The Impact of Information Technology on Business Education in Emerging Markets", paper presented at Business Education Systems and Emerging

Lee, F. (1999). "Trust and E-Commerce" url: http://socserv2.mcmaster.ca (Accessed on 12/10/06).

LeVeen (1998) "Industry Cluster Review: Urban and Regional Development", url: http://www.planning.unc.edu.html (Accessed on 03/01/06).

Lewis, I.M. (1985) *Social Anthropology in Perspective,* Cambridge University Press, Cambridge.

Liddell, C., (2003), "Wi-Fi Delivers for Developing Countries", published at: http://www.wi-fiplanet.com/columns/article.php/2199831, (Accessed on 14/08/06).

Liebman, L. (2001) "Eyes Wide Shut: A Look at B2B Marketplaces – B2B Marketplace Might Offer a wide Range of Benefits – if You Have a Stomach for Uncertainty and Risk", *Network Magazine,* Vol. 16, No.2, 2001.

Lu, M.T. and Farerell, C. (1990) "Information Systems Development in Developing Countries: An Evaluation and Recommendation", *International Journal of Information Management,* 10, 288-296.

Lu, M.T., (2001). "Digital Divide in Developing Countries", *Journal of Global Information Technology Management.* Vol.4:3.

Lucking-Reiley, D., and Spulber, D.F. (2001), "Business-to-Business Electronic Commerce", *Journal of Economic Perspectives,* 15: 55-68.

Lumsden & MacKay (2006) *"How Does Personality Affect Trust in B2C e-Commerce?",* Proceedings of the 8th ACM International Conference on Electronic Commerce (ICEC'2006). Fredericton, New Brunswick, Canada. August 14-16, 2006. NRC 48554.

Lunati, M., (2000). "Enhancing the Competitiveness of SMEs in the Global Economy: Strategies and Policies", OECD Workshop for Ministers of SMEs and Industry, Italy, 2000.

Lund, A.M., (2001). "Measuring Usability with the USE Questionnaire", *Usability Interface,* Vol.8, No.2, 2001.

Lundvall, B.-Å. (ed.) (1992). *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning..* London: Pinter (1992), ISBN 1-85567-063-1.

Madon, Shirin, (2000), "The Internet and Socio-economic Development: Exploring the Interaction", *Information Technology and People,* 13 (2). Pp.85-101. ISSN 0959-3845.

Maleski, D., "Why B2B E-Commerce is Revolutionary for a Few and Ordinary for Most (Industry Trend or Event)", Nov 2000.

Mansell, R. (1998), "Net Gains or Net Dreams?", *Development Research Insights,* No. 25, Institute of Development Studies, University of Sussex.

Mbarika, V.W.A, Okoli, C., Byrd, T.A., and Data, P. (2005) "The Neglected Continent of IS Research: A Research Agenda for Sub-Saharan Africa",

Journal of the Association for Information Systems, Vol.6, No. 5, pp. 130-170, May 2005.

McCready, A., Duncan, J.W., and Kaine, S. (2005) "Online Developments in Very Small Businesses: An Insight into Research Needs", UKAIS Conference, April 2005.

McKnight, D.H., & Chervany, N.L. (2001), "What Trust Means in E-Commerce Customer Relationships: An Interdisciplinary Conceptual Typology", *International Journal of Electronic Commerce,* Vol. 6, No. 2, p. 33–57.

Meents, S., Tan, Yao-Hua, & Verhagen, T. (2003). "Distinguishing Different Types of Trust in Online B2B Marketplaces". Proceedings of the Tenth Research Symposium on Emerging Electronic Markets 2003, pp. 53-65, Bremen: University of Bremen, Germany.

Meso, P. N. and Duncan, N., (2000). "Can National Information Infrastructures Enhance Social Development in the Least Developed Countries? An Empirical Investigation," *Journal of Global Information Management* (8) 4, pp. 30-42.

Michaelis C, Smith K and Richards S (2001), *Regular survey of small business' opinions,* Databuild Ltd.

Miles, M.B., & Huberman, A.M., (1984), *Qualitative Data Analysis: A Sourcebook of New Methods,* 2nd edition. Thousand Oaks, CA: Sage Publications, Inc., 1984.

Miller, R.L., and Brewer, J.D. (2003), "The A-Z of Social Research: A Dictionary of Key Social Science Research Concepts", SAGE Publications Ltd.

Minocha, S., French, T. & Dawson, L. (2003). 'Cultural Attractors of Usability and Customer Relationship Management in (B2C) E-Commerce Environments'. Culture and HCI: Bridging the Cultural and Digital Divides. Conference (6th: 2003). Proceedings of the 2nd British Computer Society Human Computer Interaction Workshop. Edited by K. Gunter et al. London: University of Greenwich. p37-47.

Mitra, S., (2002). "Minimally Invasive Education for Mass Computer Literacy", *CSI Communications,* 2002.

Moment, R., (2003) "Cultivating the Trust Factor in Your Business", url: http://www.chiff.com/a/business-trust.htm (visited: 20/04/05).

Moodley, S. (2002). "The Dynamics and Impacts of B2B E-commerce on the South African Manufacturing Sector", World Institute for Development Economics Research (WIDER), Discussion Paper No. 2002/79.

Moodley, S., (2003), "The Promise of Electronic Business for Less Developed Countries (LDCs)", *International Journal of Electronic Business,* Vol.1, No. 1, pp. 53-68.

Moor, J., (1985). "What is Computer Ethics?", *Metaphilosophy,* 16(4).)

Mougaya, W., (1997). *Opening Digital Markets: Battle Plans and Business Strategies for Internet Commerce,* Publisher McGraw Hill, Second Edition, (1997), ISBN 0-07-043542-1.

Myers, M.D. (1997) "Qualitative Research in Information Systems," *MIS Quarterly* (21:2), June 1997.

Myers, M.D., and Avison, D. (2002), *Qualitative Research in Information Systems: A Reader*, SAGE Publications Ltd, ISBN 0761966323.

Ndukwe, E., (2008). "A Critical Appraisal of Telecommunications and ICT Infrastructure Penetration among the Nigerian Population", published at: http://www.itnewsafrica.com/?p=1527 (Accessed on 10/12/08).

NEPAD (2001) Report, "Africa in Today's World: Between Poverty and Prosperity", url: www. (Visited: 11/11/05).

NNPIT (2001), "Use IT", Nigerian National Policy for Information Technology document published by the Federal Ministry of Science and Technology, Abuja.

Nwankwo, S. (2000). "Assessing the Marketing Environment in Sub-Saharan Africa: Opportunities and Threats Analysis". *Marketing Intelligence and Planning*, Vol.18, No. 3, 2000, pp. 144-153.

O'connor, R., (2002)."Synopsis of 'Hole in the Wall'" published at: http://www.pbs.org/frontlineworld/stories/india/thestory.html . (Accessed on 06/05/05).

Odedra, M., Lawrie, M., Bennet, M., and Goodman, S. E., (1993) "Sub-Saharan Africa: A Technological Desert," *Communications of the ACM* (36) 2, pp. 25-29.

OECD - Organisation for Economic Co-operation and Development, (2000), "Providing effective information and guidance", Issues paper, In Final conference on the transition from initial education to working life; Budapest, 21-23 May 2000. URL: http://www.oecd.org/ (Accessed on 02/03/05).

OHRLLS. (2003) List of LDCs, LLDCs and SIDS. United Nations Office of the High Representative for the Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS).

Ojukwu, D. (2005). "A new Model of B2B E-Commerce for SMEs in Developing Countries: The Nigerian Rural Perspective". e-Nigeria Conference on ICT for Sustainable Development in Nigerian Rural Areas. Abuja, Nigeria, June 2005.

Ojukwu, D. (2006). "Achieving Sustainable Growth through the Adoption of Integrated Business and Information Solutions (IBIS): A Case Study of Nigerian Small and Medium Sized Enterprises (SMEs)", *Journal of Information Technology Impact*, Vol. 6, No.1, pp. 47-60, 2006.

Ojukwu, D., & Georgiadou, E., (2007)."Towards Improving Inter-Organisational Trust amongst SMEs: A Case Study from Developing Countries", accepted for publication at the IFIP 9th International Conference on *Social Implications of Computers in Developing Countries*, Sao Paulo, Brazil, May, 2007.

Ojukwu, D., and Georgiadou, E., (2004); "Quality Improvement through the Adoption of Integrated Business and Information Solutions (IBIS): A Case Study of Nigerian Small and Medium Sized Enterprises (SMEs)". 12th

International Conference on Software Quality Management (SQM), Canterbury, UK. Proc. British Computer Society, ISBN 1-902505-56-5, pp179-191.

Okoli, C. and V. W. A. Mbarika (2003) "A Framework for Assessing E-Commerce in Sub-Saharan Africa," *Journal of Global Information Technology Management* (6) 3.

Okoli, J. Chituanya (2003), "Expert Assessments of E-Commerce in Sub-Saharan Africa: A Theoretical Model of Infrastructure and Culture for Doing Business Using the Internet", doctoral thesis, http://etd02.lnx390.lsu.edu/docs/available/etd. (Accessed on 05/03/04).

Okunoye, A. and Karsten, H. (2003), "Global Access to Knowledge in Research: Findings from Organisations in sub-Saharan Africa," *Information, Technology and People*, (16:3).

Olubamise, B., and Awe, J., (2008). Nigeria: ICT4D Annual Review 2007 published at: http://www.jidaw.com/itsolutions/ict4dreview2007.html#_ftnref12 (Accessed on 07/12/08).

Onah, Julius O., (2004). "Introduction to Small and Medium Scale Enterprises Management", in: Onah, J.S., Nwosu, I., & Ocheoha, O., (eds.), *Empowering Small and Medium Scale Enterprises in Nigeria,* ECCIMA/Manmark Associates Ltd, 2004.

Orlikowski and Baroudi (1991), "Studying Information Technology in Organisation: Research Approaches and Assumptions", *Information Systems Research* 2.1(1991), 1 – 28.

Osterwalder, A. & Pigneur, Y. (2002) "An E-Business Model Ontology for Modelling E-Business", proceedings of the 15th Bled Electronic Commerce Conference, 1-12, Bled, Slovenia, June 2002.

Osterwalder,A., Lagha, S.B. and Pigneur, Y. (2002). "An Ontology for Developing E-Business Models", *DSIage,* (2002).

Ota, T., Tamura, A., Nohara, S., and Watanabe, T., (2002). "Towards eQuality: Global EC Presents Digital Opportunity to Close the Divide between Developed and Developing Countries", MITI's Proposal for WTO EC Initiative, http://www.meti.go.jp/english/information/data/cw001019e.html. (Accessed on 26/01/04).

Oyejide, A., & Wangwe, S.M., (2003). "Trade, Industry and Technology Development in Sub-Saharan Africa: Policies, Response and Effects", (with eds. M Nissanke, E Aryeetey), *Comparative Development Experiences of Sub-Saharan Africa and East Asia: An Institutional Approach.* Ashgate (UK). ISBN 075463647X.

Paltalidis, N., and Georgiadou, E., (2002). "A Brief Survey of B2B EC Models: Guidelines for Successful Adoption", 2002.

Panos (1998), "The Internet and Poverty", Panos Media Briefing No. 28, The Panos Institute London.

Panurach, P. (1996). "Money in Electronic Commerce: Digital Cash, Electronic Fund Transfer, and E-cash", *Communication of the ACM*, June 1996, Vol. 39, No. 6.

Patton, M.A. & Josang, A. (2004) "Technologies for Trust in Electronic Commerce", *Electronic Commerce Research Journal*, Vol. 4 (2004).

Pavlou, P.A. (2002). "Institution-Based Trust in Interorganisational Exchange Relationships: The Role of Online B2B Marketplaces on Trust Formation." *The Journal of Strategic Information Systems* 11(3-4): 215-243.

Pentland, A., Fletcher, R., and Hasson, A. (2004), "DakNet: Rethinking Connectivity in Developing Nations", *Computer Journal*, Jan 2004, pp.78-83.

Petrazzini, Ben and Kibati, Mugo (1999), "The Internet in Developing Countries", *Communications of the ACM* (42:6), pp.31-36.

Petrova, R. (2002). "Impact of Electronic Commerce on the Global Economy", International Association for Official Statistics (IAOS) Conference London, 2002.

Petrovic, O., Kittl, C., and Tesksten, R.D., (2001). "Developing Business Models for eBusiness", *International Conference on Electronic Commerce*, Vienna, Oct 31- Nov 4, 2001.

Pichler, R. (2000), "Trust and Reliance – Enforcement and Compliance: Enhancing Consumer Confidence in the Electronic Marketplace". Stanford Law School

Ping, T.L. (2005), "Does the Survey Response Scale Format Matter?", paper presented at the International Military Testing Association (IMTA) conference, Singapore, November, 2005.

Pinsonneault, A., and Kraemer, K.L. (1992), "Survey Research Methodology in Management Information Systems: An Assessment", Queen's-HEC Workshop, Working Paper #URB-022.

Porter, M.E. (1990) "The Competitive Advantage of Nations", New York: Basic Books.

Porter, Michael E., (1985). "Competitive Advantage: Creating and Sustaining Superior Performance", The Free Press, 1985, p.42.

Preece, J., Rogers, Y., Sharp, H., Benyon, D., Holland, S. & Carey, T. (1994) *Human-Computer Interaction*. Wokingham, UK: Addison-Wesley.

Pressey, A.D. & Mathews B.P. (2004) "Patterns of Trust in Buyer-Seller Relationships: Motives for Formation, Drivers, Outcomes and Temporal Relationships", *Journal of Customer Behaviour*, Vol. 3, Number 1, 2004, pp. 81-100(20).

Putnam, R. D. (2001) *Bowling Alone: The Collapse and Revival of American Community*, Simon & Schuster.

Quelch J.A., and Klein L.R., "The Internet and International Marketing", *Sloan Management Review*, Spring, Vol 37, Issue3, pp. 60-76, 1996.

Raab, C. (1998) 'Electronic Confidence: Trust, Information and Public Administration, in I. Snellen & W. van de Donk (eds.), *Handbook of Public Administration in an Information Age*, Amsterdam: IOS Press.

Rabe, Jens (2001), "The Digital Divide – focus on Asia," *Deutsche Bank Research*, No. 17, August 15.

Raisch, Warren D., (2001). "The eMarketplace Strategies for Success in B2B eCommerce", McGraw-Hill, 2001.

Raman, K. S. and Yap, C. S., (1996). "From a Resource Rich Country to an Information Rich Society: An Evaluation on Information Technology Policies in Malaysia," *Information Technology for Development* (7) 3, pp. 109-31.

Ramirez, S.Z., (2005). "Evaluating Acquiescence to Yes–No Questions in Fear Assessment of Children with and without Mental Retardation", *Journal of Developmental and Physical Disabilities*, Vol. 17, No. 4, Dec 2005.

Rao, M. (2003), "Checklist for National E-readiness", *International Trade Forum*, Issue 3, p.10.

Rappa, M.A., (2004). "The Utility Business Model and the Future of Computing Services", *IBM Systems Journal*, Vol. 43, No 1, 2004.

Riegelsberger, J. (2003). "Interpersonal Cues and Consumer Trust in E-commerce", ACM International Conference on Human Factors in Computing Systems, *CHI: NEW HORIZON*, April 2003, ISBN:1-58113-637-4.

Riegelsberger, J., & Sasse, M.A., (2001). "Trustbuilders and Trustbusters: The Role of Trust Cues in Interfaces to e-Commerce Applications", presented at the 1st IFIP Conference on e-Commerce, E-Business, E-Government (i3e), Zurich, Switzerland. October 2001.

Ritchie, Jane and Lewis, J., (2003). "*Qualitative Research Practice: A Guide for Social Science Students and Researchers*", 2003, SAGE Publications.

Romulo, B., and Stofber, C., (2001). "Building Digital Bridges: The Global Business Dialogue on Electronic Commerce", *The OECD Observer*, No. 224 (January), 27-28, 2001.

Rosenfeld, S.A., (1997), "Bringing Business Clusters into the Mainstream of Economic Development," European Planning Studies, 5(1).

Satola, D., (2002), "Legal and Regulatory Aspects of Enabling Environment Strategy", presented at the United Nations Conference on Trade and Development Commission on Enterprise, Business Facilitation and Development, Geneva, 2002.

Saunders, J., (1995). "Preparing for the E-Commerce Revolution: The Technology Outlook and Opportunities".

Sharp, Woodman, Robinson (1999) "The Role of Culture in Successful Software Process Improvement", 25th EUROMICRO 99 (Vol2 p.17) IEE Computer Society.

Shelly, S., (2004). *Doing Business in Africa: a Practical Guide for Investors, Entrepreneurs and Expatriate Managers,* New Holland Publishers.

Shemi, A.P., & Magembe, B.A.S. (2003), "Challenges and Prospects of e-Commerce in Africa: The Need for Strategic Alliance and Collaboration", *Chimera*, Vol 1, Issue 3/Fall.

Sherif, K., (2002), "*e*-Commerce and the Digital Economy", The American University in Cairo.

Shilgba, L.K., (2004). "The Black Race: Myths, Complexes, and Compassion", *NigeriaWorld*, URL: http://nigeriaworld.com/feature/publication/shilgba/121004.html Dec, 2004, (Accessed on 12/01/06).

Siakas, K.V. (2001), "Cultural and Organisational Dimensions for the Engineering of Software: an Assessment Model for Software Quality Management", PhD Thesis, University of North London.

Simmie, J. (2004) "Innovation and Clustering in the Globalised International Economy" *Urban Studies*, Vol.41, Nos. 5-6, May 2004.

Simmons, E., (2005). In Gilb, T., (ed), *Competitve Engineering: A Handbook for Systems Engineering, Requirements Engineering, and Software Engineering using Planguage,* Elsevier Butterworth-Heinemann.

Singh, D. (1999) "Electronic Commerce: Issues for the South", 1999, South Centre, Switzerland.

Singh, T., Jay, V.J., and Jasvinder, S., (2001). "E-Commerce in the U.S. and Europe – Is Europe Ready to Compete?" *Business Horizons*, 44, 22 (March-April) 6 – 16.

Sisson, D. (2002). "E-Commerce: Trust & Trustworthiness – a thoughtful approach to web site quality", url: http://www.philosophe.com/commerce/trust.html (Accessed on 12/10/06).

Small Business Administration (SBA) Report (2001) found at: www.sba.gov/opc/pubs/fs40.html - 17k (visited: 27/04/2005).

Small Business Service (2000), "Small and Medium-sized Enterprises Statistics for the UK", 2000, URL:http://www.sbs.gov.uk/content/research/bb_chap1.pdf. (Accessed on 01/03/04).

Smith, R.G., Holmes, M.N., & Kaufmann, P. (1999), *Nigerian Advance Fee Fraud,* in Australian Institute of Criminology *Trends and Issues in Crime and Criminal Justice*, No 121.

Sriganesh, P. (1997). *Internet cost structures and interconnection agreements.* In L. W. McKnight and J. P. Bailey, editors, Internet Economics. MIT Press, 1997.

Stansfield M and Grant K, (2003), "An Investigation into Issues influencing the use of the Internet and Electronic Commerce among small-medium sized Enterprises", *Journal of Electronic Commerce Research,* Vol 4, No 1, pp 15-33.

Stehling, F., and Moormann, J., (2002). "Strategic Positioning of E-Commerce Business Models in the Portfolio of Corporate Banking", Proceedings of the 35th Hawaii International Conference on System Sciences.

Straub, D. W., K. D. Loch, and C. E. Hill (2001) "Transfer of Information Technology to Developing Countries: A Test of Cultural Influence Modeling in the Arab World," *Journal of Global Information Management* (9) 4, pp. 6-28.

Strauss, A. & Corbin, J. (1999) "Basics of Qualitative Research: Grounded Theory Procedures and Techniques", SAGE, 1st Ed. 1990, 2nd Ed. 1999.

Sun, H. (2002). 'Exploring cultural usability'. *IEEE Transactions on Professional Communication.* 44, (2), p.319-330.

Tan, F. B., & Sutherland, P. (2004), "Online Consumer Trust: A Multi-Dimensional Model", *Journal of Electronic Commerce in Organizations.* Vol. 2. No. 3, pp.40–58.

Tapscott, D., Lowi, A., & Ticoll, D., (2000). *Digital Capital – Harnessing the Power of Business Webs,* Boston, Harvard Business School Press.

TIA (1995). "Falling through the net: A Survey of the 'Have-nots' in Rural and Urban Ameriaca", *Telecommunications and Information Administration,* U.S. Department of Commerce, Washington, D.C.

Timmers, P. (1998). "Business Models for Electronic Markets," *Electronic Markets*, 8, No. 2, pp.3–9 (1998).

Travica, B. (2002) "Diffusion of Electronic Commerce in Developing Countries: The Case of Costa Rica," *Journal of Global Information Technology Management* (5) 1, pp. 4-24.

Turban, E., Jae Lee, David King, and Chung, H. Michael (2000) "Electronic Commerce: A Managerial Perspective", Prentice Hall, 2000.

Twist, K. (2001), "Small Business Slowly Adjusts to an Expensive and Complex New Economy", *The Digital Divide Network*, October 9.

UNCTAD (2003), "E-Business and ICT Strategies". *E-commerce and Development Report, 2003.* http://www.unctad.org/en/docs/ecdr2003_en.pdf. (Accessed: 05/03/04).

UNCTAD REPORT, (2001) "E-Commerce and Development Report, 2001", URL: http://r0.unctad.org/ecommerce/ecommerce_en/edr01 (Accessed: 05/03/04).

UNCTAD REPORT, (2002) "E-Commerce and Development Report, 2002", URL: http://r0.unctad.org/ecommerce/ecommerce_en/edr02 (Accessed: 05/03/04).

UNECA, 2006. "Enhancing the Enabling Environment in Africa: Using Information and Communications Technologies as a Catalyst for Increased Trade and Economic Growth", posted at: www.uneca.org/disd/events/2006/e-trade_fu/info.pdf. Visited on 09/12/06. (Accessed on 24/02/07).

Varian, H., Litan, R. E., Elder, A., and Shutter, J., (2002). "The Net Impact Study: The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany", 2002, URL: http://cebi.ca/410/net_impact.pdf. (Accessed on 13/06/03).

Vitale, M., Weill, P., and Ross, J. (2002). "From Place to Space: Migrating to Profitable Electronic Commerce Business Models," Center for Information

Systems Research Working Paper No. 324, Massachusetts Institute of Technology (June 2002).

Warschauer, M., (2002). "Reconceptualising the Digital Divide", MIT Press, 2002, URL:http://www.firstmonday.org (Accessed: 24/02/04).

WEF Report (2008). "Global Information Technology Report: The Networked Readiness Index Rankings 2008", http://www.weforum.org/pdf/gitr /2008/ Rankings.pdf (Accessed 02/12/08).

Wehn, U. (1998),"Internet Access for All: The Obstacles and the Signposts, Development Research Insights, No. 25, Institute of Development Studies, University of Sussex.

Weill, P.,Malone, T.W., D'Urso, V.T., Herman, G., and Woener, S., (2005). "Do Some Business Models Perform Better than Others? A Study of the 1000 Largest US Firms" , MIT Center for Coordination Science Working Paper No. 226.

Wen, J.H., Chen, Houn-Gee, and Hwang, Hsin-Ginn (2001). "E-commerce Web site design: strategies and models", Information Management & Computer Security, 9/1.

White, Wendy D. (1998) "International Assistance for Internet Growth for Sub-Saharan Africa", ASIS Bulletin, June- July, 1998.

Wilson, T.D. (2002), "Philosophical foundations and research relevance: issues for information research", Keynote address delivered to CoLIS4 - Fourth International Conference on Conceptions of Library and Information Science: Emerging Frameworks and Method, University of Washington, Seattle, USA, 2002.

Wymer, S., and Regan, E., (2004, May), "Incentives and Barriers to the Use of E-Business and E-Commerce Information Technologies in Small Businesses in Rural America", Proceedings of 15th IRMA International Conference, New Orleans, pp 1160-1162.

Yeo, A.W. (2001). 'Global-software development lifecycle: An exploratory study'. Human Factors and Computer Systems. Conference (4th. 2001). Proceedings of the SIGCHI conference on Human factors in computing systems. New York: ACM Press. p104-111.

Yin, R. (1984, 1989). Case Study Research: Design and Methods (Rev. ed.). Beverly Hills, CA: Sage Publishing.

Ying, Fang and Anjana, Susarla (2001), "Measuring the Internet Economy", The Internet Economy Indicators Report, Wave IV, University of Texas, Jan 2001, available online at: http://www.internetindicators.com/jan 2001.pdf. (Accessed on 11/06/04).

Zhang, Y., (2008). "Connect African Summit Commits to Bridging the Digital Divide", UN Chronicle, Vol.XLV, No. 1 (2008).

Zwass, Vladimir (1966), "Electronic Commerce: Structures and Issues", International Journal of Electronic Commerce, Vol 1, No.1, Fall, 1996, pp. 3 - 23.

APPENDIX 1.0

List of Publications

1.   Ojukwu, D. and Georgiadou, E., (2007). **Towards Improving Inter-Organisational Trust (IOT) amongst SMEs: A Case Study from Developing Countries**. The International Federation for Information Processing (IFIP) 9th International Conference on "Social Implications of Computers in Developing Countries", Sao Paulo, Brazil, May 28 - 30, 2007

2.   Gibbs, P. and **Ojukwu, D.,** (2007). *Learning Agreements and/or Contracts: What do they Promise?* Work Based Learning Network Conference organised by Universities for Lifelong Learning (UK), London, UK, July 5 - 6, 2007.

3.   **Ojukwu, D.** (2006). **Achieving Sustainable Growth through the Adoption of Integrated Business and Information Solutions: A Case Study of Nigerian Small & Medium Sized Enterprises**. *Journal of Information Technology Impact*, Vol. 6, No. 1, pp. 47-60, 2006.

4.   **Ojukwu, D.** (2005). **A new Model of B2B E-Commerce for SMEs in Developing Countries: The Nigerian Rural Perspective.** *E-Nigeria* Conference on "ICT Development for Sustainable Development in Nigerian Rural Areas", Abuja, Nigeria, June 2005.

5.   **Ojukwu, D.,** and Georgiadou, E., (2005); **Maximising the Benefits of B2B E-Commerce by SMEs in Developing Countries: The Cluster Model Alternative.** The International Federation for Information Processing (IFIP) 8th International Conference on "Social Implications of Computers in Developing Countries", Abuja, Nigeria, May 25-28, 2005.

6.   Ojukwu, D. (2005); **A Model for the Adoption and Implementation of a Viable and Accessible B2B E-Commerce for SMEs in Developing Countries.** 10th UKAIS PhD Consortium, Northumbria University 21st – 22nd March 2005.

7.   Ojukwu, D., and Georgiadou, E., (2004); **An Evaluation of the Impact of Integrated Business and Information Solutions (IBIS) on the Growth of Small and Medium Sized Enterprises (SMEs) in Nigeria,** 15th Information Resources Management Association (IRMA) International Conference, New Orleans, USA, May 2004.

8.   Ojukwu, D., and Georgiadou, E., (2004); **Quality Improvement through the Adoption of Integrated Business and Information Solutions (IBIS): A Case Study of Nigerian Small and Medium Sized Enterprises (SMEs).** 12th International Conference on Software Quality Management (SQM), Canterbury, UK. Proc. British Computer Society, ISBN 1-902505-56-5, pp179-191.

APPENDIX 1.1

Field Study Report .

4.1. Introduction

The Field Study is a major component of this research effort. The main objective of this Field Study was to generate the data to be used in answering the research questions developed in this project. These research questions which helped in framing the hypotheses for the project focussed on how to find solutions to the deployment and implementation problems confronting small and medium sized enterprises (SMEs) in developing countries, particularly those in sub-Saharan Africa (SSA) with a view to attracting more SMEs to the new global electronic trade.

This study was conducted in Nigeria between the months of June and July, 2006. It was a follow-up on the Pilot Study conducted in 2005. The results of the Pilot Study helped in restructuring the questionnaire used in the main Field Study. They also helped in refocusing and reshaping the interest of the project by now investigating specifically how the issues of Cost, Trust, Security and Culture affected the ability of SMEs in engaging in electronic commerce. Furthermore, the experience gained as well as the contacts made during the Pilot Study stage informed the design and conduct of this Field Study.

4.2. Data Collection and Management

The data collected through this Field Study were captured from the three Nigerian cities of Abuja, Lagos and Enugu. The instrument used in data collection was the questionnaire. The questionnaire contained 25 questions, comprising three main sections. The first section was meant to capture personal details of the respondents. The second section dealt with the profiles of the respondents' businesses or companies, while the third section was designed to capture data on the use of the Internet, and particularly business to business electronic commerce (B2B E-C) in the conduct of business.

4.2.1 Changes in the Questionnaire

Following the successful completion of the Pilot Study in 2005, a lot of changes needed be made in the questionnaire (see Appendix 1.4). One reason for the changes was to make the questionnaire more suitable to the specific areas of interest in the study. Most of the questions in the questionnaire were framed in such a manner as to elicit information from respondents using a four-point Likert-type scale ranging (in some cases) from 'Strongly Agree' to 'Strongly Disagree' with 'Agree' and 'Disagree' in the middle. There was no room for such neutral options as 'Don't Know' or 'Unknown' as they tended to provide some kind of cheap 'escape routes' to some respondents who would prefer to sit on the fence. Furthermore, in order to avoid 'acquiescence response sets', the options were varied from 'Very High' to 'Very Low' depending on the questions. One more feature of this study is that a lot of the respondents required some form of assistance in completing the questionnaires especially some of the technical terminologies used in the questionnaire. Structured interviews were also conducted with some of the respondents. The reason for doing so was to help in throwing more light on some of the responses offered by the respondents.

Another very important change had to do with the rewording/rephrasing of some of the questions with a view to reducing ambiguity. For instance, Question 7 was changed from 'What types of Arts/Craft does your company engage in?' to 'What is the main type of Arts/Craft your company engages in?' The key word here is 'main' because most of the artists used in the Pilot Study claimed they engaged in practically all the options on offer. In order therefore to reduce this apparent spectre of 'jack-of-all-trades', this change became inevitable.

Furthermore, Question 3 of Section C was reframed to find out from all the respondents what they thought were the main reasons why some small businesses do not use the Internet for their business transactions. The reason behind this change was to enable the respondents (both those using the Internet now and those not doing so yet) to identify the reasons for this apathy. This would give a better understanding of the factors affecting lack of

182

Internet use more than would be the case had we depended only on one section of the small business community.

Unlike the Pilot Study, most of the respondents in this Field Study were professional arts/crafts people. This meant that the number of questionnaires administered was less (230) than the number used for the pilot study (450). Others used in this study included some members of arts exhibiting groups like 'AKA' and 'OKANGA', some academics (teachers of crafts), policy makers in some of the bodies relevant to the study, like the Small and Medium sized Enterprises Development Agency of Nigeria (SMEDAN), National Information Technology Development Agency (NITDA), Standards Organisation of Nigeria (SON), and some banks and other allied businesses.

4.2.2 Questionnaire Administration

Due largely to the experience and insights gained during the Pilot Study stage, most questionnaires were administered using the face-to-face approach as against the postal method. During the Pilot Study stage for instance, of the 75 Questionnaires administered by post in Abuja, only 9 (representing just 12%) were received. In fact, the Lagos experience was not dramatically different from that of Abuja as only 15 (representing 12.5%) of the 120 questionnaires distributed in the city by post were received. On the other hand, of the 14 questionnaires administered in the city using the face-to-face method, 8 (or 57%) of the questionnaires were received.

One other major reason informing the change of approach is the issue of the level of validity of the received questionnaires. Still using the Abuja experience, of the 9 questionnaires received by post during the pilot study, a total of 5 (or 56%) were invalid. Conversely, all the 8 received questionnaires administered by face-to-face method were valid. In order therefore to reduce the high level of casualty affecting questionnaires administered by post, we changed the method of administering the questionnaires. This, unfortunately, meant that fewer numbers of the questionnaire were administered.

A greater number of the questionnaires used in the Field Study were administered by hand while the rest were administered using a combination of delivery methods (such as postal services, email and via the Internet). Of the 230 questionnaires administered, a total of 145 were received. As shown in the table below (Table 4.1), 122 out of the 145 received were eventually used for the analysis as the other 23 were found to be invalid due to one thing or the other. The data contained in the 122 questionnaires are being used for this analysis.

Table 4.1: Showing Questionnaire Distribution

No Sent	No Received	No Valid	No Invalid	Total Not Used
230	145	122	23	108

4.2.3 The 'AKA' Group of Exhibiting Artists

In the course of questionnaire administration and interviews, the researcher came in contact with some groups of arts/crafts producers, marketers and sellers, administrators and teachers as well as groups of exhibiting artists. In Abuja and Lagos, for instance, there were groups of individuals who have formed associations and organisations with a view to catering for the business interests of their members and their relationships with their publics. Their publics in this case included art/crafts curators, collectors, buyers and sellers, government officials and agencies. There is the Arts Dealers Association at the 'Arts Village' Abuja for instance. In Lagos, there is also the Maryland Arts/Crafts Association. These bodies, though not regulatory in nature, help in controlling the influx of what the Director of Egi Creativity Ltd, Francis Egi who is also a group member of the Lagos group described as 'tokumbo artists' (that is those artists who try to exploit the art market with poor quality products).

In Enugu, there also exist such groups of exhibiting artists as 'OKANGA' and 'AKA'. The AKA group, originally comprising 13 active artists and academics had their first exhibition in 1985. Between then and now, they have held 26

joint exhibitions. The main objective behind the formation of the group according to Chris Afuba one of the founding members is to have "a forum for exhibiting artists of varied styles to pool their resources together and to show their works annually in a unique, visual feast". The artists realised that it would be more 'cost effective' to have joint exhibitions as it would be more costly and difficult for each member of the group to have solo exhibitions. The main areas of specialisation for the group members are Painting, Sculpture, Ceramics and Textile.

The AKA group members have accepted to participate in this research work. The members would be used to represent each individual entity in the project. This affords the researcher a lot of opportunities in the areas of management of data and designing the framework. Furthermore, one major characteristic of the group is that each member is independent even though they all share some facilities. This therefore means that the members meet the characteristics of the components of the SMEs originally proposed for the study. Their acceptance to participate also saves a lot of logistic problems for the execution of the project. Furthermore, there is the added advantage of the members of the group being in one geographical location (Enugu). This means that co-ordination difficulties and other operational problems would be minimised.

One other very important benefit of using the members of this group for the project is the fact that some of them are both arts/crafts teachers and practitioners while others are pure professional artists. But one major characteristic of this group is that all of them have the benefit of higher education. So, it is envisaged that using them for the project would add more quality and applicability to the project. It would also help in making the findings of the project more generalisable.

4.3. Preliminary Data Analysis

a) Demographic Data Analysis

Some of the demographic analyses of the data collected from the respondents used in the study are contained in tables 2 to 4. These analyses are based on the data collected from the 122 respondents used in the study.

Table 4.2: A Distribution of Age and Professional Sector

		Business Sector					Total
		Production/ Sales/Training	Production/ Sales	Sales only	Training/ Consultancy	Policy Making/ Governance	
Respondent's Age	18-25	4	1	0	0	0	5
	26-35	22	7	2	1	1	33
	36-45	24	11	1	1	0	37
	46-55	29	9	3	2	1	44
	56 and above	2	0	0	0	1	3
Total		81	28	6	4	3	122

As shown in Table 4.2, there seem to be more crafts people within the 46-55 years age group (44) than those within the 36-45 (37) and 26-35 (33) age groups. It also shows that there are fewer respondents within the 18-25 and 56-and-above age-brackets who participated in the study than those within the other age groups. These data appeared to be a reflection of the situation in the country with regard to practising arts/crafts. In the academic community for instance, there appears a noticeable downfall in the number of students offering Arts and Crafts. According to Chris Afuba who also teaches Fine and Applied Arts at the Institute of Management and Technology (IMT) Enugu, young Nigerians' interest in arts production and management seems to be waning. He observed that, "The fact that the number of students studying Arts in our higher institutions is dropping shows that our youngsters are more interested in professions that give them quick returns... (like Banking, Business Studies, etc)".

Table 4.3: Showing the Distribution of Business Sector and Arts/Crafts Types Engaged in

		Arts/Craft Type Engaged in					Total
		Sculpture	Furniture	Pottery	Textiles	Painting	
Business Sector	Production/Sales/ Training	40	4	4	7	26	81
	Production/Sales	12	4	2	2	8	28
	Sales only	4	0	0	1	1	6
	Training/ Consultancy	2	0	0	1	1	4
	Policy Making/ Governance	1	1	0	0	1	3
Total		59	9	6	11	37	122

Table 4.3 shows that of all the Arts/Crafts people used in the study, Sculpture and Painting seem to be the most popular activities, particularly amongst those actively involved in the production and sales of artworks as well as in the training of young artists.

Another issue worth exploring in this report is the relationship existing between the artists' Gender and their Educational Qualifications as they affect their cities of business. As has been stated, three Nigerian cities of Abuja, Lagos and Enugu are used for this Field Study. These cities are located in the North, South-West and South-East of Nigeria respectively. As shown in Table 4.4, there are more male respondents in this study than their female counterpart as the table shows that only 9 of the 122 respondents are female 77.8% of whom are located in Lagos while the rest conduct their business in Abuja. Furthermore, over 66% of the practising artists located in Enugu have higher educational qualifications (that is above GCSE qualification). In Lagos, those in this category constitute 63% of all the respondents used in the study; while Abuja has the lowest representation with 57% of the practising artists who participated in the study have the benefit of higher education.

Table 4.4: A Distribution of Respondents' City of Location, Gender and Educational Qualification

		City of Location				
		Abuja		Lagos		Enugu
		Respondent's Sex		Respondent's Sex		Respondent's Sex
		Male	Female	Male	Female	Male
Respondent's Educational Qualification	GCSE	15		21	2	8
	OND/NCE/HND	10		25	2	9
	BA/BSc	5	1	6	2	4
	MA/MSc	3	1	4	1	3

b) Statistical Data Analysis

The preliminary data analysis for this Field Study was done using the Statistical Products and Service Solutions (SPSS) statistical package version 15. This study was designed to investigate how the issues of COST, TRUST, SECURITY and CULTURE affect how small businesses use the Internet in conducting their business transactions.

The first observation to be made while looking at the generated data is that the level of Internet use by small businesses is still very low. Figures 1 and 2 contain information relating to the use of the Internet for two activities: Email and Conducting of Sales by small businesses. As can be seen in Fig 1, the respondents show a very high level of Email activity. This activity of course cannot be regarded as core B2B activity in the sense of conducting business as it entails mere communication between businesses or individuals (just like making telephone calls).

Use Email for Business
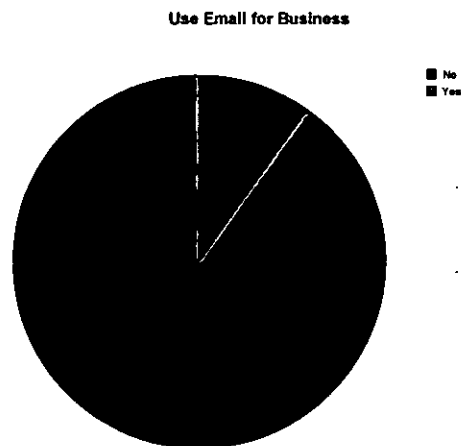
Fig 4.1: Use of Email for Business

However, when a 'more serious' use of the Internet in conducting business transactions is explored, the result appears dramatically different. As shown in Fig 2,
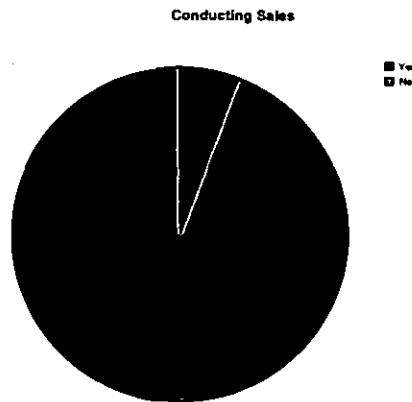
Fig 4.2: Conducting Sales using the Internet

a greater majority of the respondents do not find using the Internet in conducting Sales very attractive. In fact, a greater percentage of the responses (94%) show that there are more businesses that do not conduct Sales than those that use the Email service (90%).

Having established that fewer businesses use the Internet to Conduct Sales than they use it for Emails, it was important to explore and identify the reasons that brought about this state of affairs. Due largely to the intricate nature of the issues involved in this investigation, the Likert-style type of questionnaire design was used. This gave options on the levels of 'acceptability' or 'rejection' of the idea being explored by the respondents. The responses ranged from 'Very Strong' to 'Very Weak' with no option for 'Don't Know' so as to avoid 'fence-sitting'.

Two issues or areas of interest have been selected for further analysis in this report: COST of using the Internet and LACK OF TRUST on the Internet technology. As shown in Tables 5 and 6, the two issues weigh heavily on why a lot of small businesses are not using the Internet for their business transactions.

Table 4.5: A Distribution of Respondents' Responses on Cost of Using the Internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strong	58	47.5	47.5	47.5
	Strong	36	29.5	29.5	77.0
	Weak	20	16.4	16.4	93.4
	Very Weak	8	6.6	· 6.6	100.0
	Total	122	100.0	100.0	

On the issue of COST for instance, a high percentage of the respondents (47.5%) feel very strongly that the issue constitutes a stumbling block on the path of the small businesses using the Internet. This is slightly higher than their views on the effect of TRUST (38.5%).

Table 4.6: How Lack of Trust on the Internet Technology affects SMEs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strong	47	38.5	38.5	38.5
	Strong	52	42.6	42.6	81.1
	Weak	14	11.5	11.5	92.6
	Very Weak	9	7.4	7.4	100.0
	Total	122	100.0	100.0	

However, when the issues are viewed collectively on a 'Yes'-and-'No' basis, the Trust issue weighs heavier (81% agreed that Lack of Trust affects more small business in their use of the Internet as against 77% who blame it on the Cost of the Internet Technology).

Conclusion

Looking purely on these preliminary findings, there seems to be a strong indication that the issues of COST of and TRUST on the Internet Technology heavily affect the ability and willingness of small businesses in sub-Saharan Africa to use the Internet in conducting their businesses. Further analysis will either validate or reject this conclusion.

190

APPENDIX 1.2

Pilot Study Report

1. Introduction

As a part of this research effort, a pilot study was conducted in Nigeria between the months of May and July, 2005. The primary aim of this study was to test and validate the instrument to be used in capturing data – the Questionnaire. The result of this effort was expected to help in restructuring the questionnaire for a better result during the main Field Study. Furthermore, the experience gained in the exercise as well as the contacts made would be of tremendous assistance during the next and more important phase of the research work. Perhaps, it is pertinent to add, that the pilot study would act as a sort of peer feedback. Since some of the respondents in this study were academics, the expectation was that their feedback would be of high quality which would help in the validation of the data capturing instrument (Okoli, 2003).

2. Data Generation

The main source of data used in this study was captured from the three Nigerian cities of Abuja, Lagos and Enugu between May and July, 2005. The instrument used in data collection was the questionnaire. The questionnaire contained 28 questions, comprising three main sections. The first section was meant to capture personal details of the respondents. The second section dealt with the profiles of the companies of the respondents, while the third section was designed to capture data in the use of business to business electronic commerce (B2B E-C) in the conduct of business.

Most of the questions in the questionnaire were framed in such a manner as to elicit information from respondents using a four-point Likert-type scale ranging (in some cases) from 'Strongly Agree' to 'Strongly Disagree' with 'Agree' and 'Disagree' in the middle. There was no room for such neutral options as 'Don't Know' or 'Unknown' as they tended to provide some kind of cheap 'escape routes' to some respondents who would prefer to sit on the

fence. Furthermore, in order to avoid 'acquiescence response sets', the options were varied from 'Very High' to 'Very Low' depending on the questions. A total of 450 questionnaires were administered in the three Nigerian cities used for this study. A combination of delivery methods (including postal services, email, by hand and via the Internet) was used in administering the questionnaires to the respondents. Of the number administered to the respondents, 113 (about 25%) were received. Seven of the received questionnaires were unusable leaving 98 (approx. 21.7%) questionnaires which were used for this analysis.

3. Pre-Pilot Study

Before conducting the pilot study, the data capture instrument was tested. There are two basic reasons for this exercise. One was to validate the questionnaire and the other was to find out if the questionnaire needed any changes before being used for the pilot study.

This test was in the form of administering the questionnaire to a handful of academics and business people who attended the 8th International Working Conference of the International Federation of Information Processing (Working Group 9.4) taking place in Abuja the capital city of Nigeria. In all, 10 questionnaires were administered.

After reviewing the results of the pre-pilot study, it became very clear that some changes needed be made in the questionnaire.

3.1 Changes in the Questionnaire

During the IFIP Abuja conference, 10 questionnaires were administered to some of the conference participants. Five of them were given to some of the participants from the business community (both big and small businesses), and the other five were given to people from the academic community.

Table 1: Showing Questionnaire Distribution for the Pre-Pilot Study

Respondents	No Administered	No Received
Entrepreneurs	5	5
Academics	5	5
Total	10	10

After going through the received questionnaires, the following changes were made based on the observations made from the result of the pre-pilot study:

a) In Section B, it was observed that Question 5 contained some duplication. For instance, option '(a)' contained 'Wholesale/Retail Trade' which was also repeated in option '(k)'. So the options were reduced from 16 to 9.

b) Question 1, Section C was restructured to include 'business activities' instead of 'businesses' as was originally contained in the questionnaire. The reason being that some of the entrepreneurs did not have more than one business (and in any case, the researcher's interest was not on their businesses *per se* but on their business activities).

c) Question 5 of Section C had four response sets ranging from "Very True" to "Very Untrue". Since some of the respondents argued that a statement could either be "True" or "Untrue" (as there are no degrees of truthfulness or otherwise), the response sets were changed to just "True" and "Untrue".

d) Furthermore, two more items 'h' and 'i' were added to incorporate some payment methods for online business transactions.

e) Question 18 was brought forward (as the new Question 13 in the new Questionnaire). The question sought to find out how the identified 'reasons for B2B collaboration' reflected the respondents' experiences. The new arrangement helped the respondents to know, from the outset, the benefits derivable from B2B collaboration thereby giving them the opportunity to compare those benefits with their own experiences.

f) Question 18 (now Question 13 in the new questionnaire) was also reframed and amended to measure the level of importance the respondents attached to the factors influencing their decision to participate in B2B collaboration.

g) As a result of the re-arrangement, the former Questions 13, 14 and 15 were moved further down to 16, 14 and 15 respectively.

h) The response sets for Question 19 were also adjusted in line with those in Question 3 (as stated in "c" above).

i) Questions 15 and 16 (which now form 'a' and 'b' of the new Question 17) were reframed and a table added in order to make it easier for respondents to understand what it was all about. The reason being that the more clearly the respondents understood the question, the better the clarity and meaningfulness of their answers. Two more factors namely 'Lack of adequate government support' and 'Lack of adequate legal protection' were added to the list of factors in the table.

4. Questionnaire Administration

Three cities - Abuja, Lagos and Enugu - were covered in the pilot study.

4.1 The Abuja Field Study

The IFIP Conference ended on 29 May. The Field Study had originally been planned to start on Monday 30 May. This activity was delayed for one day as the Monday was a bank holiday in Nigeria. The day was not however wasted as the opportunity was utilised in reorganising and redesigning the strategies for the job in hand.

Furthermore, the opportunity was used in making some useful phone calls and in arranging interviews and meetings with some of the small businesses in the capital city. Since some questionnaires had been printed on Saturday 29 May, most of them were addressed and ready for postage the next day.

Apart from distributing most of the questionnaires by post and via email, some of them were also administered by hand to the respondents. It was found that while most of the ones administered by hand were completed and returned (or in most cases, collected by the researcher), a large number of the ones sent by post did not arrive at the given address even though self-addressed and stamped envelopes had been included. The good news however is that a good number of the questionnaires were still received before the researcher left Abuja on 4 June for Lagos. The other method used in questionnaire administration was email. This was of course followed up with more phone

calls and, in some cases, meeting with the respondents and sharing some discussions. This method was found to be particularly more rewarding in terms of the percentage returns of the questionnaires administered through this method than was the case with the postal method.

One thing noticed about the low level of returned questionnaires administered through the post was that the Nigerian postal system is not well organised or reliable. Even after contacting some of the respondents and being assured that the questionnaires had been posted, some of them were still received two weeks after the researcher had left Abuja. The good thing however was that the researcher's Abuja experience helped in 'restrategising' the Lagos Field Study.

Abuja is a very busy city. It is however a light year behind Lagos in terms of number of business enterprises and volume of business. The fact that it is the new political and administrative capital of Nigeria meant that most of the activities there are of the business to government (B2G) mode rather than B2B. Most entrepreneurs do business with the federal government agencies and parastatals as well as the city authority. Of course, loads of B2B activities still go on in the city.

4.1.1 Sample Selection

One of the first steps taken in Abuja was to use the local yellow pages to do a random selection of names of prospective respondents. This was followed by a series of phone calls aimed at arranging and agreeing on dates and times for either dropping off questionnaires (and receiving them) or conducting interviews. A greater percentage of those to whom the questionnaires were posted comprised those who could not be reached on the telephone or whose places of business were further away from the metropolis. In all, a total of 131 questionnaires were administered through a combination of postal, email and face-to-face methods. Of this number, 75 were administered by post, while 42 and 14 were administered by email and face-to-face methods respectively. As shown in Table 1, so far a total of 35 Questionnaires were received.

Abuja Summary		
Questionnaire Administered	No Administered	No Received
By Post	75	9
Via Email	42	18
Face-to-Face	14	8
Total	**131**	**35**

4.2 The Lagos Field Study

As stated, the Abuja experience helped the researcher in mapping out a more robust, organised and result-oriented strategy for the Lagos leg of the field work. One of the important phone calls made while still in Abuja was to contact a senior officer in the Manufacturers Association of Nigeria (MAN) in Lagos who made available to me his personal copy of a compact disk (CD) containing a comprehensive list of Nigerian businesses in all parts of the country. During the opening sessions of the IFIP Conference, I had met a member of staff of MAN who told me about the existence of the CD.

Since he did not have a copy, he gave me the details of the officer in Lagos who would help me. When I contacted the Lagos officer, he told me there was no copy left in their office. He however promised to arrange a copy for me. As it turned out, he ended up giving me his personal copy.

Sample Selection

The CD, aptly titled "Nigerian Business Directory", was produced under the auspices of the Commonwealth Heads of Government Meeting which took place in Nigeria in 2003. It contained a total of 4,496 registered companies operating in various parts of the country. The names are alphabetically arranged. This arrangement was of great help in making a random selection of an equal number of names (10) from each letter of the alphabet. The exception was the letter 'X' which contained only one company. However, this short-fall was made up by selecting the remaining nine companies as follows:

196

three companies were selected from 'A' (which had 476 companies), two samples were selected from 'C' (containing 324 companies), 'M' (containing 326 companies) and 'S' (with 351 companies). The CD also helped in the company names, addresses and contact names (and telephone numbers) of the people through which more information about the companies was obtained. The samples and methods of questionnaire administration are contained in Table 2.

Unfortunately, the CD did not contain any web or email addresses of the listed companies. This meant that the researcher had to rely on a combination of the printed business directories and Internet search using mainly the Google search engine to overcome this problem. In some cases, the information was obtained through making phone calls to the offices (or contact persons) of the companies.

One other piece of vital information missing from the CD was the status of the listed companies. As it turned out, most of the listed companies were micro scale (the research interest was on small and medium scale businesses).

Table 2: Lagos Questionnaire Summary

Lagos Summary		
Questionnaire Administered	No Administered	No Received
By Post	120	15
Via Email	129	44
Face-to-Face	22	8
Combined (Post & Email)	13*	Not Known
Total	284	67

(*Note: This number included some companies that had already been questionnaires by post but who confirmed during telephona follow-ups that they had not received. Thus additional copies needed to be resent through email.)

Finally, after the selection, it was discovered that some of the selected samples were companies operating in other parts of the country outside the geographical areas covered by Lagos. To overcome this problem, the samples were replaced with other companies selected from the alphabetical groups of the rejected ones. In other words, any 'invalid' sample selected from 'A', for example, would be replaced with a 'valid' sample from the same 'A' group.

4.3 The Enugu Field Study

The city of Enugu, the capital of the researcher's home state, was not originally included in the cities to be used in the Field Study. However, it was felt that adding the city to the study would give more diversity to the research effort. Furthermore, a lot of local small businesses had offices in some other parts of the country. The data to be generated from them therefore would be representative of the geo-political diversity of the country.

Beyond this however, there was the 'political' reason for including the city. Nigeria has three predominant tribes: Igbo, Hausa and Yoruba. These tribes occupy the three clearly-defined regions (East, North and West) of the country. It was felt therefore that for more representative sampling, three cities of commerce representing the dominant tribes/regions, should be incorporated in the Field Study. Abuja would provide data for the Northern (predominantly Hausa) region; Lagos for the Western (mainly Yoruba) region; while Enugu would represent the Eastern (predominantly Igbo) region.

As shown in Table 4, a total of 35 questionnaires were administered using various methods. Of this figure, only 7 was received which was included in the overall number of questionnaires used in the analysis of this data generated for the Field Study.

Enugu				
DELIVERY METHOD	NUMBER DELIVERED	NUMBER RECEIVED	Valid	Invalid
By Post	-	-	-	-
Via Email	-	-	-	-
By Hand	35 (Approx)	7	7	-
Post and Email	-	-	-	-
Internet	-	-	-	-
TOTAL	35	7	7	-

5. Analysis of the Pilot Study Data

For the analysis of the data generated in this study, the SPSS 12.1 for Windows software package was used. This package was used because of the major packages, it seems to be the easiest to use for the most widely used statistical techniques. It can be used with either a Windows point-and-click approach or through syntax (i.e., writing out of SPSS commands.) Each has its own advantages, and the user can switch between the approaches

There are also two important limitations that deserve mention at the outset:

SPSS users have less control over statistical output than, for example, Stata or Gauss users. For novice users, this hardly causes a problem. But, once a researcher wants greater control over the equations or the output, she or he will need to either choose another package or learn techniques for working around SPSS?s limitations.

According to Infocomm Development Authority of Singapore (IDA) (2000), a Gartner survey reveals that 12 times more fraud exists on the Internet transactions while WebAssured found that fear of fraud is the number one reason users decide against making online purchases. This has given rise to a situation where, even though, the technology maybe available, consumers and businesses lack the trust and confidence in the network to conduct online

transactions, and to optimise the vast opportunities offered by electronic commerce.

As discussed in the research design (chapter/section) a number of hypotheses needed to be tested.

One of the Hypotheses is:

An increase in the level of Trust in Electronic Business will result in an increase in the level of SME participation in E-Commerce in SSA.

The central issue here has to do with TRUST. The main questions used in addressing this issue are contained in Section C, Questions 1, 3, 4 and 5. In Question 1, the respondents were asked if they used the Internet in any part of their business activities. Of the 98 respondents, an overwhelming majority (90.8%) claimed they used the Internet in one form or the other in their business activities.

This high level of Internet 'use' is not entirely surprising given that among the most popular 'business activities' they conducted online are: 'Use of email', 'Customer Interaction', and 'Sharing Information with Customers'. Of course, while it could be argued that these can be categorised as business activities, they are not, strictly speaking, core business activities in electronic commerce sense.

As shown in Table 5, very few core electronic business activities are conducted online by the SMEs which took part in the study. Such activities as 'Buying and Making Payments to Suppliers', 'Conducting Sales' and 'Debt Management' were found to be less attractive to most of the SMEs than the most popular ones. For instance, more than 70% of the respondents do not conduct sales online.

There is also no single respondent who conducted all their businesses online. As one respondent (a chief executive) stated in a structured interview,

> "Our policy is to use a combination of electronic, conventional and even traditional methods in conducting our business activities. We use any method that is more cost-effective and result-oriented for any given business activity. Put differently, it is our business target or goal that determines which method or strategy that can be best used to achieve the required result." (Maitama Aminu)

One other very striking feature of the data generated is that only 9% of the participating SMEs claim they do not perform any kind of electronic business function. Remarkably, when they were asked why they did not do use the Internet for any of their business activities, most of them blamed "Lack of trust on the technology", "Lack of trust on customers" and "Fear of Security of Internet business transactions" as some of their reasons.

Table 5: Business Activities Conducted Online by SMEs

Business Activities Conducted Online	Yes		No	
	Count	%	Count	%
Use Email for Business	89	91	9	9
Interacting with Customers	89	91	9	9
Procurement	62	63	36	37
Electronic Data Interchange	27	28	71	72
Sharing Information With Customers ·	89	91	9	9
Buying or Making Payments to Suppliers	27	28	71	72
Placing Adverts/Publicity/Promotions	34	35	64	65
Conducting Sales	27	28	71	72
Delivering Services to Clients	15	15	83	85
Human Resources Management	70	71	28	29
After Sales Support	74	76	24	24
Debt Management	27	28	71	72
All Aspects of my Business	0	0	98	100

5.1 Analysis of the Industrial Sectors

For the data generation, five industrial sectors were used in the study, viz: Manufacturing and Construction, Banking and Finance, Educational and Entertainment, Leisure and Tourism, and Human Resources Management and Consultancy. Of the five industrial sectors used (as shown in Fig 1), Banking and Finance towers above all others in their level of participation. This sector is followed by the Manufacturing and Construction industry.

Business Sector

Business Sector
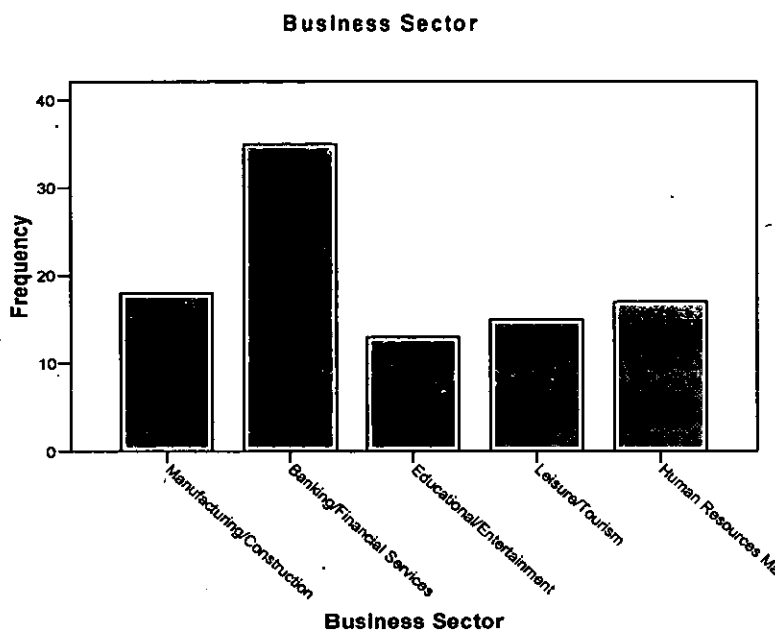
<u>**Fig 1: Industrial Sector-Participation Distribution**</u>

Looking at the issues of Trust and Security across the five industrial sectors shows that SMEs are more sceptical about the Security of the technology than the Trust they have on the technology. Furthermore, as shown in Fig 2, the Education/Entertainment sector is the least sceptical about the two issues than the other four sectors.
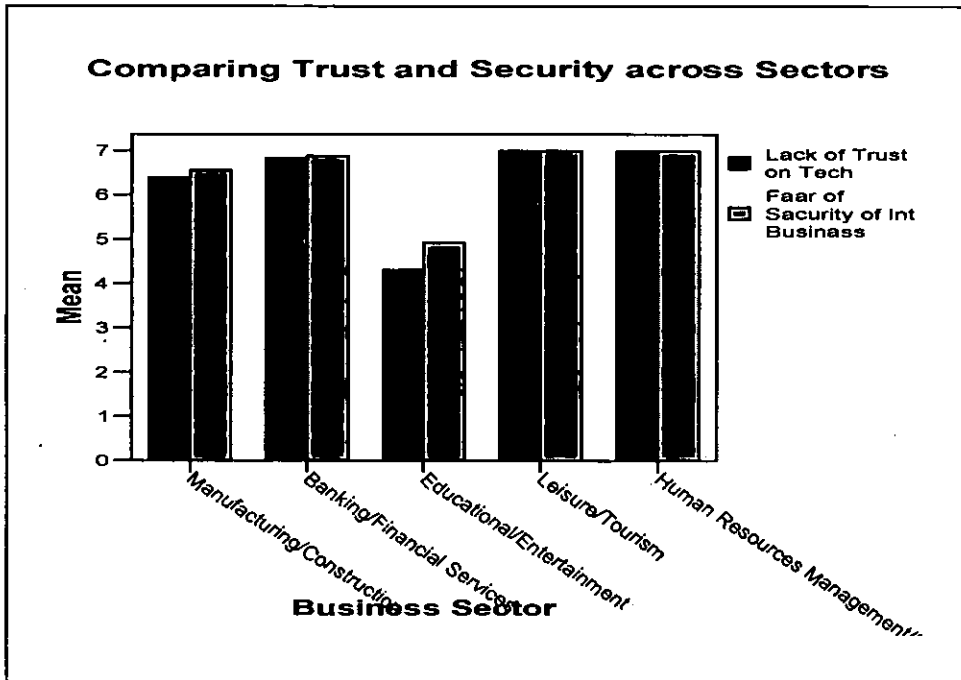
Fig 2: Comparing Trust with Security

The disparities that exist amongst the five industrial sectors with respect to the issue of how Trust affects the decision of the SMEs to participate in B2B electronic commerce are worthy of further analysis. As shown in Fig 3 below, the Banking and Finance sector appears more sceptical with trusting the technology and their customers, hence their high level of lack of trust. Conversely, the Education and Entertainment sector does not seem to care. Of course, these disparities can be explained from the point of view that when the issue of money is at stake, the Banking and Finance sector has more to loose than the Education and Entertainment industry.

Furthermore, the educational institutions would naturally be at ease with the issue of security of Internet transactions since they would understand the implications a lot better than the banking and financial institutions.

Why Some SMEs Don't Use the Internet for Business

Comparing Trust on Technology and Trust on Customers
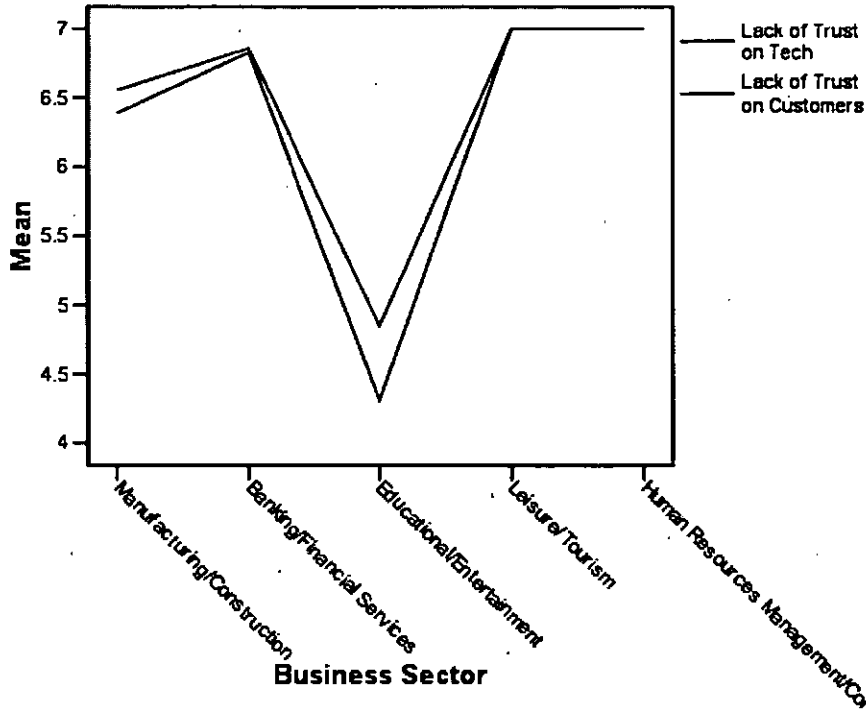
Fig 3: Comparing Trust on Technology with Trust on Customers across Business Sectors

6. Conclusion

This Pilot Study has been a very important feature of this research project. The experience and contacts made during this study will greatly affect the conduct of the main Field Study. Furthermore, the findings will help the redesigning of the Questionnaire as well as in deciding how the study would be conducted.

APPENDIX 1.3

Pilot Study Questionnaire

SECTION A:

Personal Profile

Please type 'X' in the parentheses or write where appropriate

1. Name (Optional): ....

2. Job Title: ....

3. Sex: (a) Male ( )   (b) Female ( )

4. Age   (i) 18-25   ( )
            (ii) 25-30   ( )
            (iii) 31-40   ( )
            (iv) 41-50   ( )
            (v) 51 and above   ( )

5. Educational Qualification: (a) GCSE   ( )
                              (b) OND/NCE/HND   ( )
                              (c) BA/BSc   ( )
                              (d) MA/MSc   ( )
                              (e) PhD   ( )
                              (f) Others (Please
        Specify)....................................

SECTION B:

Company Profile

Please insert 'X' in the parentheses or write where appropriate

1.   What is the name of your company? ....

2.   What is the location of your company (City/State)..................

3.   In what year did your company start trading? ....

4.   How many employees does your company have? ....

5. What kind of business does your company do?
- (b) IT/Telecommunications/Internet ( )
- (c) Health Care/Social Welfare ( )
- (d) Manufacturing/Construction ( )
- (e) Banking/Financial Services ( )
- (f) Educational/Entertainment ( )
- (g) Oil/Energy ( )
- (h) Transportation/Housing ( )
- (i) Leisure/Tourism ( )
- (j) HRM/Consultancy ( )

6. Indicate which categories your company belongs to:
- (a) Limited Liability ( )
- (b) Limited Liability Partnership ( )
- (c) Partnership ( )
- (d) Sole Trader ( )
- (e) Franchised Operation ( )
- (f) Plc ( )
- (g) None of the Above ( )

SECTION C:
Electronic Business Practices

1. Do you use the Internet in conducting any of your business activities?
(a) Yes ( )   (b) No ( )

2. If your answer to Question 1 above is 'Yes', which aspects of your business activities do you conduct online?

(a) Email	
(b) Interacting with customers	
(c) Procurement	
(d) Electronic Data Interchange (EDI)	
(e) Sharing of Information with customers	
(f)Buying or making payments to suppliers	
(g) Placing adverts/publicity/promotions	
(h) Conducting Sales	
(i) Delivering services to clients	
(j) Human Resources Management	
(k) After-sales support	
(l) Debt Management	
(m) All aspects of my business	
(n) Others *(Please specify)*	

3. If your answer to Question 1 above is 'No', which of the following factors most appropriately reflect your reason(s) for not using the Internet to conduct any of your business activities?
(Please insert 'X' or tick '√' where appropriate)

Reasons for no Internet Use	How Strong are the Reasons			
	Very Strong	Strong	Weak	Very Weak
(a) Cost of using the Internet for business				
(b) Lack of trust on the Internet technology				
(c) Lack of trust on customers				
(d) Fear of fraud				
(e) Fear of Security of Internet business transactions				
(f) Lack of relevant technology				
(g) Lack of relevant skills				
(h) Lack of face to face interaction with customers				
(i) Fear of sabotage				
(j) Poor Infrastructure				
(k) Poor Legal Framework				
(l) Lack of government support				
(m) Others *(Please specify)*				

4. If the reasons you have given in Question 3 are rectified, would you like to conduct your businesses online? (i)Yes [ ] (ii) No [ ]

5. Given all you know about Electronic Business in your country, what would be your assessment of how the following factors would affect the willingness of small businesses to engage in EB?

Factors Affecting Poor Internet Use	How Strong are the Factors			
	Very Strong	Strong	Weak	Very Weak
(a) Cost of using the Internet for business				
(b) Lack of trust on the Internet technology				
(c) Lack of trust on customers				
(d) Fear of fraud				
(e) Fear of Security of Internet business transactions				
(f) Lack of relevant technology				
(g) Lack of relevant skills				
(h) Lack of face to face interaction with customers				
(i) Fear of sabotage				
(j) Poor Infrastructure				
(k) Poor Legal Framework				
(l) Lack of government support				
(m) Others *(Please specify)*				

6. Which of the following statements most appropriately reflect your experience with Electronic Business (EB) in your country? *(Please insert 'X' where appropriate)*

Electronic Business (EB)	Your Answer	
	True	False
a) I have a web site for my business		
b) I share a business website with a colleague		
c) My business website is hosted by my firm		
d) I conduct EB using my website		
e) I use my EB site for online presence only		
f) I interact with my customers online		
g) I interact with my suppliers online		
h) I receive payments from customers online		
i) I also receive payments through other means (eg Cheques)		

7. Please indicate how much you agree or disagree with the following statements:

Electronic Business (EB)	Agree Strongly	Agree	Disagree	Disagree Strongly
a) E-B awareness is on the increase in the country				
b) E-B Policy in the country is well defined				
c) The trust level for users of E-Business in the country is good				
d) There is adequate security for E-Business transactions in the country				
e) The government is giving enough support for E-Business growth in the country				
f)The laws governing the use of the Internet for E-Business are effective				
g) E-Business activities in the country are highly developed				

8. Please indicate how much you agree or disagree with the following statements on the level of   E-Business infrastructure in the country:

E-Business Infrastructure	Agree Strongly	Agree	Disagree	Disagree Strongly
a) A lot of businesses are using wireless networks in their Internet connectivity				
b) Most businesses still connect to the Internet via modem				
c) There is a high level of Internet Service Providers (ISPs) in the country				
d) The Internet users enjoy a high level of reliable services from the ISPs				
e) The country is blessed with large numbers of skilled IT personnel				
f) There is adequate number of wireless networks such as VSAT, satellite and microwave links in the country				
g) The supply of electricity (by national grids or back generators) is reliable				

Use of Private Network (Intranet) in the company.

9. Do you have a private network (PN) in your company?   (i)Yes [ ]   (ii) No [ ]

10. If your answer to Question 8 is 'No', please indicate which of the following reasons most adequately reflect your organisation's situation on the issue:

Use of Private Network (PN)	True	False
a) My organisation does not need it		
b) My organisation does not have the expertise to run it		
c) It is very expensive to deploy/maintain		
d) We do not know what PN is		
e) My organisation will start using PN as soon as we have the technology		
f) My organisation will start using PN as soon as we have the skills		
g) My organisation will start using a PN as soon as our competitors deploy theirs		
h) My organisation will start using a PN if we know that it would help our business		

Method of Payment

11. Please indicate your order of preference for the following payment methods for your EB activities:

Method of Payment	Level of Preference			
	Very High	**High**	**Low**	**Very Low**
a) Electronic Data Interchange (EDI)				
b) Electronic Fund Transfer (EFT)				
c) Credit/Debit Card				
d) Swift				
e) Bank Cheques				
f) Inter-bank Transfer				
g) Physical Cash				
h) Postal/Money Order				
i) Others *(Please state)*				

Level of Security of Payment Methods

12. Please indicate how secure or otherwise these payment methods are for Electronic Business transactions in your country.

Method of Payment	Level of Security			
	Very High	**High**	**Low**	**Very Low**
a) Electronic Data Interchange (EDI)				
b) Electronic Fund Transfer (EFT)				
c) Credit/Debit Card				
d) Swift				
e) Bank Cheques				
f) Inter-bank Transfer				
g) Physical Cash				
h) Postal/Money Order				
i) Others *(Please state)*				

Problems of E-Business implementation

13. The following factors have been identified as problems confronting E-Business implementation in Nigeria. Please indicate how significant these factors are based on your experience.

Factors Affecting EB Implementation	Very Significant	Significant	Insignificant	Very Insignificant
a) Cost of doing business online				
b) Security of online transactions				
c) Building trust amongst users				
d) Building trust on the technology				
e) Cost of acquiring Internet technology				
f) Poor Business Strategies				
g) Lack of relevant technology				
h) Lack of relevant skills				
i) The fear of fraudulent practices				
j) Lack of adequate government support				
k) Poor legal framework for E-B activities				

B2B Collaboration

14. The table below contains some of the factors that give rise to B2B collaboration among small businesses. Please indicate how important these factors would be in influencing your decision to participate in B2B collaboration with other small businesses in your area.

B2B Collaboration	Level of Importance			
	Very Low	Low	High	Very High
a) Increased Revenue				
b) Increased Clientele				
c) Reduced Overhead				
d) Increased Job Opportunities				
e) Enhanced Competitive Advantage				
f) Prompt Deliveries				
g) High Quality of Customer Care				
h) Increased Sales				
i) New Products/Service Development				
j) Reliable Business Forecast				
k) Customer Profiling				
l) Business Data Storage/Retrieval				
m) More Secured Business Transactions				
n) Employee Satisfaction				
o) Increased Productivity				
p) Time Maximisation/Job Targets				
q) More Familiarity with Equipment				

15. Are you willing to collaborate with some other small businesses in order to exploit the benefits of Electronic Business? Yes ( )   No ( )
16. If your answer to Question 15 is "Yes", will you be willing to share a joint web site with your collaborators? Yes ( ) No ( ).
17. Would you like to participate in a model of B2B which encourages group sharing of resources?
(a) Yes   (b) No

18. (a) The following reasons have been given by some people for their non-participation in B2B collaboration. How significant are these reasons in your own experience?

Unwillingness to Collaborate with Others	Level of Significance			
	Very Significant	Significant	Insignificant	Very Insignificant
a) Cost of doing business online				
b) Poor business strategies				
c) Lack of business objectives				
d) Lack of adequate government support				
e) Lack of Trust among members				
f) Lack of Security				
g) Fear of fraud				
h) Competition				
i) Lack of relevant technology				
j) Lack of relevant skills				
k) Lack of adequate legal protection				
l) Any other (Please specify)				

18(b) What other kind of collaboration would you like to have with other small businesses in this area? *Please specify:*

....

19. Use of DakNet Wireless Network for Electronic Business Activities
It is claimed that the DakNet Wireless broadband telecommunications is very cheap and reliable in connecting to the Internet for communication and other online-related activities.

DakNet	True	Untrue
a) I have heard about this network		
b) If the network is deployed in this country, I will you use it for my business		
c) I am currently using another network		
d) My current network is very reliable		
e) My current network is very cheap		
f) I am willing to switch to DakNet if it is cheaper		
g) I am willing to switch to DakNet if it is more reliable		

Thank you for completing this questionnaire. Please save the questionnaire as a Word document, and send to me by email: d.ojukwu@mdx.ac.uk.

APPENDIX 1.4

Field Study Questionnaire

SECTION A:

Personal Profile
Please type 'X' in the parentheses or write where appropriate

1. Name (Optional): ....

2. Job Title: ....

3. Sex: (a) Male ( )   (b) Female ( )

4. Age (i) 18-25   ( )
         (ii) 26-35   ( )
         (iii) 36-45   ( )
         (iv) 46 -55   ( )
         (v) 56 and above   ( )

5. Educational Qualification: (a) GCSE   ( )
                                 (b) OND/NCE   ( )
                                 (c) HND/BA/BSc   ( )
                                 (d) MA/MSc   ( )
                                 (e) PhD   ( )
                                 (f) Others (Please
           Specify)...............................

6. Vocational Training: a) Yes   b) No

SECTION B:
Company Profile
Please insert 'X' in the parentheses or write where appropriate

1. What is the name of your company? ....

2. What is the location of your company (City/State)....................

3. In what year did your company start trading? ....

4. How many employees does your company have?......................

5. What kind of business does your company do?
  a) Manufacturing Craft works ( )
  b) Distribution ( )
  c) Selling Craft Works ( )
  d) Arts/Craft Education/Training ( )
  e) Policy Making/Governance ( )
  f) Consultancy ( )

6. Indicate which categories your company belongs to:
  (h) Limited Liability ( )
  (i) Partnership ( )
  (j) Sole Trader ( )
  (k) Plc ( )
  (l) None of the Above ( )

7. What is the main type of Arts/Craft your company engages in?
  a) Sculpture ( )
  b) Furniture ( )
  c) Pottery ( )
  d) Textiles ( )
  e) Painting ( )
  f) Others (Please specify) ....

SECTION C:
Electronic Business Practices

1. Do you use the Internet in conducting any of your business activities?
(a) Yes ( )   (b) No ( )

2. If your answer to Question 1 above is 'Yes', what activities do you use the Internet for?
(Please insert 'X' or tick '√' where appropriate)

(a) Email	
(b) Procuring raw materials from Suppliers	
(c) Processing Orders from Customers	
(d) Buying or making payments to suppliers	
(e) Placing adverts/publicity/promotions	
(f) Conducting Sales and Receiving Payments	
(g) Delivering services to clients	
(h) Human Resources Management	
(i) After-sales support to Customers	
(j) Debt Management	
(k) All aspects of my business	
(l) Others (Please specify)	

214

3. Based on current situation in your country, how would the following factors affect your decision to use the Internet to conduct your business activities? *(Please insert 'X' or tick '√' where appropriate)*

Reasons for no Internet Use	How Strong are the Reasons			
	Very Strongly	Strongly	Weakly	Very Weakly
(a) Cost of conducting business online				
(b) Cost of acquiring Internet technology				
(c) Cost of hiring Internet experts				
(d) Lack of trust in the Internet technology				
(e) Lack of trust in online customers				
(f) Lack of trust in Internet experts				
(g) Fear of fraud				
(h) Fear of Security of online transactions				
(i) Fear of security of Internet technology				
(j) Lack of relevant technology				
(k) Lack of relevant skills				
(l) Poor Legal Framework				
(m) Lack of government support				
(n) Others *(Please specify)*				

4. If the factors you have given in Question 3 are rectified, how would you rank your willingness to conduct your businesses online?

          (i) Very Willing   [ ]
          (ii) Willing   [ ]
          (iii) Unwilling   [ ]
          (iv) Very Unwilling [ ]

5. Indicate how your decision to use the Internet for your business activities would be affected if the following factors prevail in your country. *(Please insert 'X' or tick '√' where appropriate)*

Factors Affecting Willingness to use Internet	Your Response			
	Very Weakly	Weakly	Strongly	Very Strongly
(a) Low cost of conducting business online				
(b) Reduced cost of acquiring Internet technology				
(c) Low cost of hiring Internet experts				
(d) Improved level of trust in the Internet technology				
(e) Improved level of trust in online customers				
(f)High level of trust in Internet experts				
(g) Reduction in the level of online fraud				
(h)Improved level of Security of online transactions				
(i) Improved level of security on Internet technology				
(j) Availability of Relevant Technology				
(k) Availability of Relevant Skills				
(l) More legal protection for Online transactions				
(m) More government support for Online activities				
(n) Others *(Please specify)*				

6. How much do you agree or disagree with the following statements?

Statement	Your Response			
	Strongly Agree	Agree	Disagree	Strongly Disagree
(a) I can not participate in online trading because I can not do business with a customer I do not see				
(b) I can not participate in online trading because I do not engage in business deals in an environment I can not control				
(c) I can not participate in online trading because my language is different from the one being used in Online communication				

Method of Payment
7. Please indicate your order of preference for the following payment methods for your EB activities:

Method of Payment	Level of Preference			
	Very High	High	Low	Very Low
a) Electronic Data Interchange (EDI)				
b) Electronic Fund Transfer (EFT)				
c) Credit/Debit Card				
d) Swift				
e)Bank-Guaranteed Cheques				
f) Personal Cheques				
g) Physical Cash				
h) Postal/Money Order				
i)Others (Please state)				

B2B Collaboration

8. There is a wide-spread culture of *Isusu* in Nigeria. How significant do you think this culture is in enhancing EB practices in the country?
   a) Very Significant   ( )
   b) Significant   ( )
   c) Insignificant   ( )
   d) Very Insignificant   ( )

9. How willing are you to participate in an E-Business collaborative framework in which you share E-Commerce facilities with some other small businesses like yours?
   a) Very Willing   ( )
   b) Willing   ( )
   c) Unwilling   ( )
   d) Very Unwilling   ( )

10. Based on your knowledge of the level of resources available to small businesses in your country, how would you agree or disagree with the following statements?

Statement	Your Response			
	Strongly Agree	Agree	Disagree	Strongly Disagree
(a) More small businesses would be willing to share E-Business facilities with others.				
(b) More small businesses can afford to acquire E-Business facilities own their own.				
(c) Sharing E-Business facilities would attract more small businesses into online business.				
(d) Sharing E-Business facilities would be unattractive to small businesses.				

11. Please indicate which of the following facilities you would be willing to share with others. *(Please tick where appropriate)*

     a) A joint Web site only   ( )
     b) A joint Web site and some facilities   ( )
     c) A joint Database   ( )
     d) A joint E-Catalogue   ( )
     e) All E-Business facilities   ( )
     f) No E-Business facilities   ( )

12. The table below contains some of the factors that give rise to E-Business collaboration among small businesses. Please indicate how important these factors would be in influencing your decision to participate in E-Business collaboration with other small businesses in your area.

B2B Collaboration	Level of Importance			
	Very Low	Low	High	Very High
a) Increased Revenue				
b) Increased Clientele				
c) Reduced Overhead				
d) Increased Job Opportunities				
e) Enhanced Competitive Advantage				
f) Reduced Operational Costs				
g) High Quality of Customer Care				
h) Increased Sales				
i) More access to International Markets				
j) Reliable Business Forecast				
k) Better Customer Profiling				
l) More Secured Business Transactions				
m) Earning the Trust of the Global Business				
n) Increased Productivity				
o) Time Maximisation				
p) Exploiting Global Markets				

Thank you for completing this questionnaire.

APPENDIX 2.1

Abbreviations and Acronyms

- ADC – Asynchronous Digital Connectivity
- ASCA – Accumulating Savings and Credit Association
- B2B – Business to Business
- B2C – Business to Consumer
- B2G – Business to Government
- C2C – Consumer to Consumer
- CAPs – Community Access Points
- EDI – Electronic Data Interchange
- EFT – Electronic Funds Transfer
- ETSI – European Telecommunication Standardization Institute
- GLO
- GSM – Global System of Mobile Telecommunications
- IBIS – Integrated Business and Information Solutions
- ICT – Information and Communication Technology
- IEEE – Institute of Electrical and Electronics Engineers
- ITU – International Telecommunications Union
- LAN – Local Area Network
- LDCs – Least Developed Countries
- MAP – Mobile Access Point
- MDG – Millennium Development Goal
- MSME – Micro, Small and Medium-Sized Enterprise
- MTN – Mobile Telecommunications Network
- NEPAD – New Partnership for Africa's Development
- PADIS – Pan-African Development Information Service
- PC – Personal Computer
- PDA – Personal Digital Assistant
- PSTN – Publicly Switched Telephony Network
- RFQs – Requisition for Quotations
- ROSCA – Rotating Savings and Credit Association
- SARI – Sustainable Access for Rural India
- SBA – Small Business Administration
- SBS – Small Business Service?
- SME – Small and Medium Sized Enterprise
- SSA – Sub-Saharan Africa
- SSL – Secure Socket Layer
- UNCTAD –United Nations Conference on Trade and Development
- VPN – Virtual Private Network
- VSAT – Very Small Aparture?
- WEP – Wireless Encryption Protocol
- WiFi – Wireless Fidelity
- WLAN – Wireless Local Area Network
- WLL – Wireless Local Loop
- WTO – World Trade Organisation

APPENDIX 4.1

Variable Constructs and their Operational Definitions

Construct	Code	Operational Definition	Relevant References
a) Cost of Using Internet for Business	CEB	Cost of conducting your business using the Internet	Garicano & Kaplan (2001)
1. Cost of EB Transactions	CEBX	Cost of selling your wares, receiving payment, placing and tracking orders from customers online	Zhu and Kraemer (2002); CID (2000); Vadapalli and Ramamurthy (1998).
2. Cost of Acquiring Internet Technologies	CEBT	Cost of buying or renting the technologies that support the Internet	Our definition
3. Cost of Hiring Internet Experts and Consultants	CEBE	Cost of obtaining the services of consultants and ISPs who provide the expertise for the smooth functioning of your Internet services	Our definition
b) Trust in Electronic Business	TEB	Trust in using the Internet to conduct your business	Our definition
1. Trust in Internet Technologies	TEBT	Your level of trust in the technologies that support your Electronic Business relationships with your customers and publics	Our definition
2. Trust in Internet Customers	TEBC	Your level of trust in the quality, authenticity and reliability of the information, goods and services you exchange with customers using the Internet network	Lee & Turban (2001); McKnight & Chervany (2002); Chopra & Wallace (2003); Bhattacherjee (2002)
3. Trust in Internet Experts/Consultants	TEBE	Your level of trust in the Internet experts who maintain and manage your online activities	Our definition
c) Security of Electronic Business	SEB	Respondents' perception of how well protected the information, goods and services being exchanged on the Internet are.	Josang (1999); Friedman et al (2000); Jones et al (2000); Grandison & Sloman (2001).
1. Online Fraud issues	SEBF	Perception of how online fraudulent activities (like spamming, phishing, identity theft, etc) affect Internet use.	Our definition
2. Security of Online Transactions	SEBX	Perception of how safe the information, goods and services being traded on the Internet are in respect of their authentication, non-repudiation, confidentiality and validation.	Our definition
3. Security of Internet Technologies	SEBT	Perception of the ability of the technologies of the Internet to safeguard the information, goods and services being traded online from falling into the wrong hands	Our definition
d) Culture of using Electronic Business	CIB	Perception of the impact of culture in engaging in Electronic Business	Hofstede, 1980; Checcbi et al, 2002; Powell, 2001; Straub et al, 2001.
1. Culture of Face2Face Trading	CF2F	Lack of face2face interaction between trading parties in Internet transactions is against our business culture.	Our definition
2. Electronic Business is difficult to control	CBCP	Exerting Power and Control over Electronic Business is difficult	Schein (1985)
3. Language Barrier hinders use of Electronic Commerce	CNLB	Our national language culture does not support Electronic Business practices.	Our definition

APPENDIX 4.2

Appendix 4.1: Showing the Results of Cross Tabulation Analysis for CIBF across the Cities

			City of Location			Total
			Abuja	Lagos	Enugu	
Biz only on Face2Face basis	Strongly Agree	Count	1	13	1	15
		Expected Count	4.3	7.7	3.0	15.0
		% within Biz only on Face2Face basis	6.7%	86.7%	6.7%	100.0%
		% within City of Location	2.9%	20.6%	4.2%	12.3%
		% of Total	.8%	10.7%	.8%	12.3%
	Agree	Count	11	10	6	27
		Expected Count	7.7	13.9	5.3	27.0
		% within Biz only on Face2Face basis	40.7%	37.0%	22.2%	100.0%
		% within City of Location	31.4%	15.9%	25.0%	22.1%
		% of Total	9.0%	8.2%	4.9%	22.1%
	Disagree	Count	7	20	10	37
		Expected Count	10.6	19.1	7.3	37.0
		% within Biz only on Face2Face basis	18.9%	54.1%	27.0%	100.0%
		% within City of Location	20.0%	31.7%	41.7%	30.3%
		% of Total	5.7%	16.4%	8.2%	30.3%
	Strongly Disagree	Count	16	20	7	43
		Expected Count	12.3	22.2	8.5	43.0
		% within Biz only on Face2Face basis	37.2%	46.5%	16.3%	100.0%
		% within City of Location	45.7%	31.7%	29.2%	35.2%
		% of Total	13.1%	16.4%	5.7%	35.2%
Total		Count	35	63	24	122
		Expected Count	35.0	63.0	24.0	122.0
		% within Biz only on Face2Face basis	28.7%	51.6%	19.7%	100.0%
		% within City of Location	100.0%	100.0%	100.0%	100.0%
		% of Total	28.7%	51.6%	19.7%	100.0%

APPENDIX 5.1

Questionnaire for Validation (Experts)

Personal Profile
Please type 'X' in the parentheses or write where appropriate

1. Name (Optional): ....

2. Job Title: ....

3. Name of Institution ....

4. Areas of Specialisation ....

5. Gender: (a) Male ( )   (b) Female ( )

6. Age (i) 18-25   ( )
        (ii) 26-35   ( )
        (iii) 36-45   ( )
        (iv) 46 -55   ( )
        (v) 56 and above   ( )

∩

Model Validation
Fig 1: Showing a Diagrammatic Representation of the Model
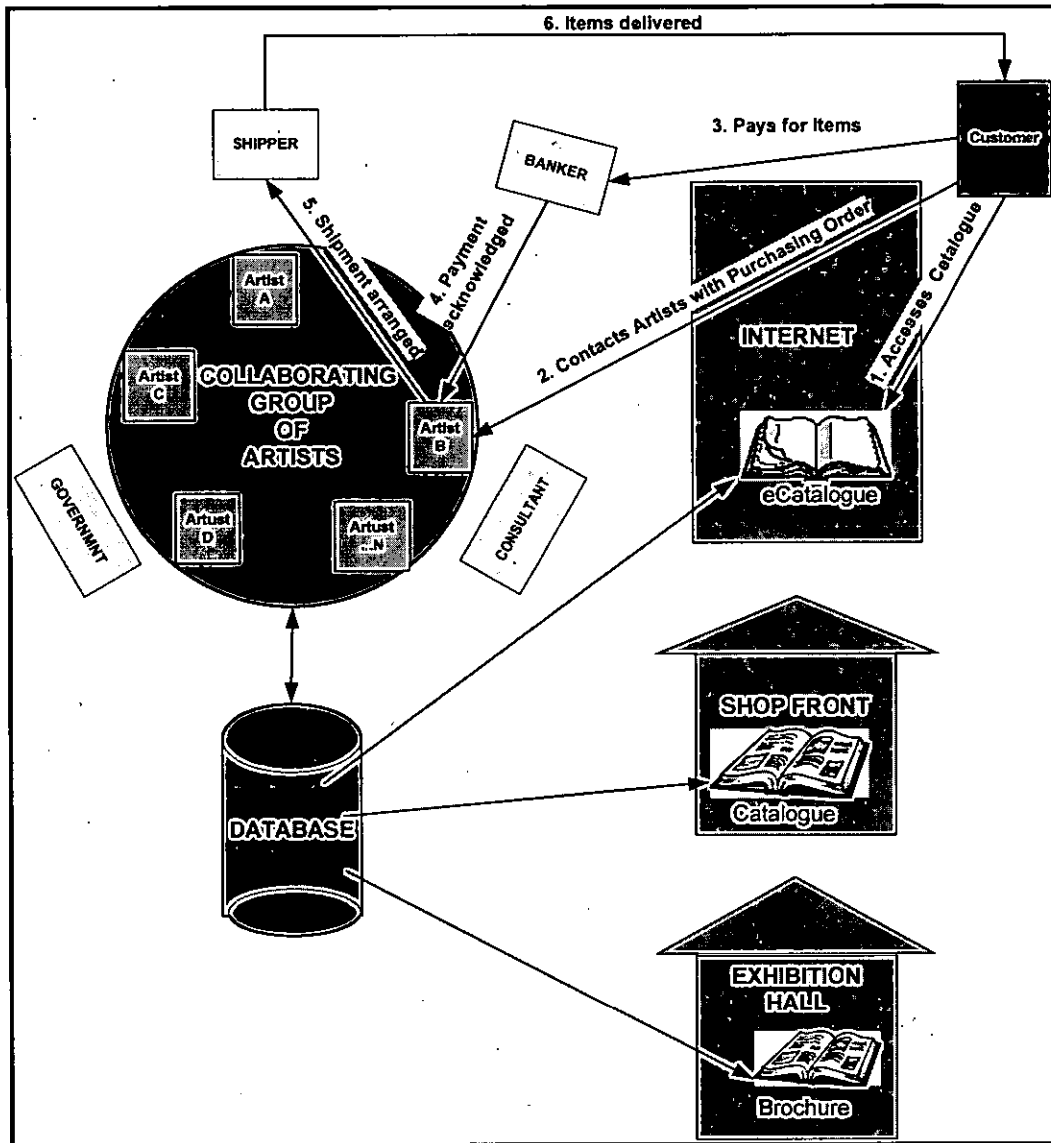
i)   Fig 1 is a simplified diagrammatic representation of the designed model. It shows the online relationships between the ARTIST GROUP (like AKA, OKANGA, etc) members and their CUSTOMERS. It also shows that there are four INTERMEDIARIES between the GROUP members and their CUSTOMERS. They are: GOVERNMENT; BANKS; SHIPPERS; and CONSULTANTS. The GOVERNMENT makes and executes the laws governing E-Commerce relationships; BANKS receive and process payments on behalf of the GROUP members and their CUSTOMERS; SHIPPERS deliver the paid items to the CUSTOMERS; while CONSULTANTS maintain and upgrade the Website and other necessary technologies being used by the GROUP for E-Commerce activities.

ii)   Processes 1 to 6 describe how the relationships between the GROUP members and their CUSTOMERS develop from the time the CUSTOMERS see the art works contained in the E-Catalogue published online to the time they take delivery of the paid art works.

iii)   Furthermore, the diagram shows that while the online activities are still going on, the GROUP members can also maintain the other methods of conducting business through the traditional Shopfront (owned by individual members) and seasonal or annual individual and/or joint Exhibitions.

iv)   From your understanding of the activities, processes and actors involved in Fig 1 and as described from numbers 1 to 3 above, please let us know your opinions in the following areas:

(Please insert 'X' or tick 'v' where appropriate)

1. Based on the activities/processes in Fig 1. please give your assessment of how workable this Model is
    a) Highly Workable   ( )
    b) Workable   ( )
    c) Unworkable   ( )
    d) Highly Unworkable   ( )

2. Please give a short explanation for your choice
    ....
    ....
    ....
    ....

3. The processes as described in Fig 1 make some business sense to me.
    a) Strongly Agree   ( )
    b) Agree   ( )
    c) Disagree   ( )
    d) Strongly Disagree   ( )

4. Please provide a brief explanation or comment /clarification for your choice.
    ....
    ....
    ....
    ....

5. The model as described in Fig. 1 has the ability to accommodate collaborative use by a collection of small businesses.
    a) Strongly Agree   ( )
    b) Agree   ( )
    c) Disagree   ( )
    d) Strongly Disagree   ( )

6. Please indicate the degree to which how much you agree or disagree with the following statements;

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
(a) The Model is likely to save costs for the individual SMEs participating in the framework				
(b) More foreign businesses are more likely to trust SMEs collaborating in the framework than individual SMEs operating on their own.				
(c) It has been observed that foreign entrepreneurs are more likely to do business with small businesses (SMEs) in developing countries who have organised themselves as groups (like the one described in Fig 1) than with SMEs operating individually.				
(d) Operating collaboratively as shown in the Model is likely to attract more small businesses in developing countries into E-Business.				
(e) More SMEs in developing countries would be willing to participate in E-Commerce if the technology to support this kind of collaborative arrangement is developed				

7. Please let us know your views on:
   a. How the workability of the Model can be enhanced
   ....
   ....

   b. What names (descriptive words/phrases) do you think would be most suitable for a model (and its components) of this nature?
   ....
   ....
   ....

8. What do you foresee as the major deficiencies of the Model?
   ....
   ....
   ....

9. Any other comments, criticisms, suggestions will be greatly appreciated
   ....
   ....
   ....

Thank you for completing this questionnaire. If you would like a copy of my findings, please send me a mail at: d.ojukwu@mdx.ac.uk.

APPENDIX 5.2

Questionnaire for Validation (SMEs)

SECTION A:

Personal Profile

Please type 'X' in the parentheses or write where appropriate

.1. Name (Optional): ....

2. Job Title: ....

3. Sex: (a) Male ( )   (b) Female ( )

4. Age   (i) 18-25   ( )
            (ii) 26-35   ( )
            (iii) 36-45   ( )
            (iv) 46 -55   ( )
            (v) 56 and above   ( )

SECTION B:
Company Profile
Please insert 'X' in the parentheses or write where appropriate

7. What is the name of your company?

....
....
....

8. What kind of business does your company do?
            g) Production/Sales/Training   ( )
            h) Production and Sales   ( )
            i) Sales only   ( )
            j) Training/Consultancy   ( )
            k) Policy Making/Governance   ( )
            l) Others *(please specify)* ....

9. What Arts/Craft types does your company engage in?
   a) Sculpture   (.)
   b) Furniture   ( )
   c) Pottery   ( )
   d) Textiles   ( )
   e) Painting   ( )
   f) Others (Please specify) ....

SECTION C:
Model Validation

Fig 1: Showing a Diagrammatic Representation of the Model
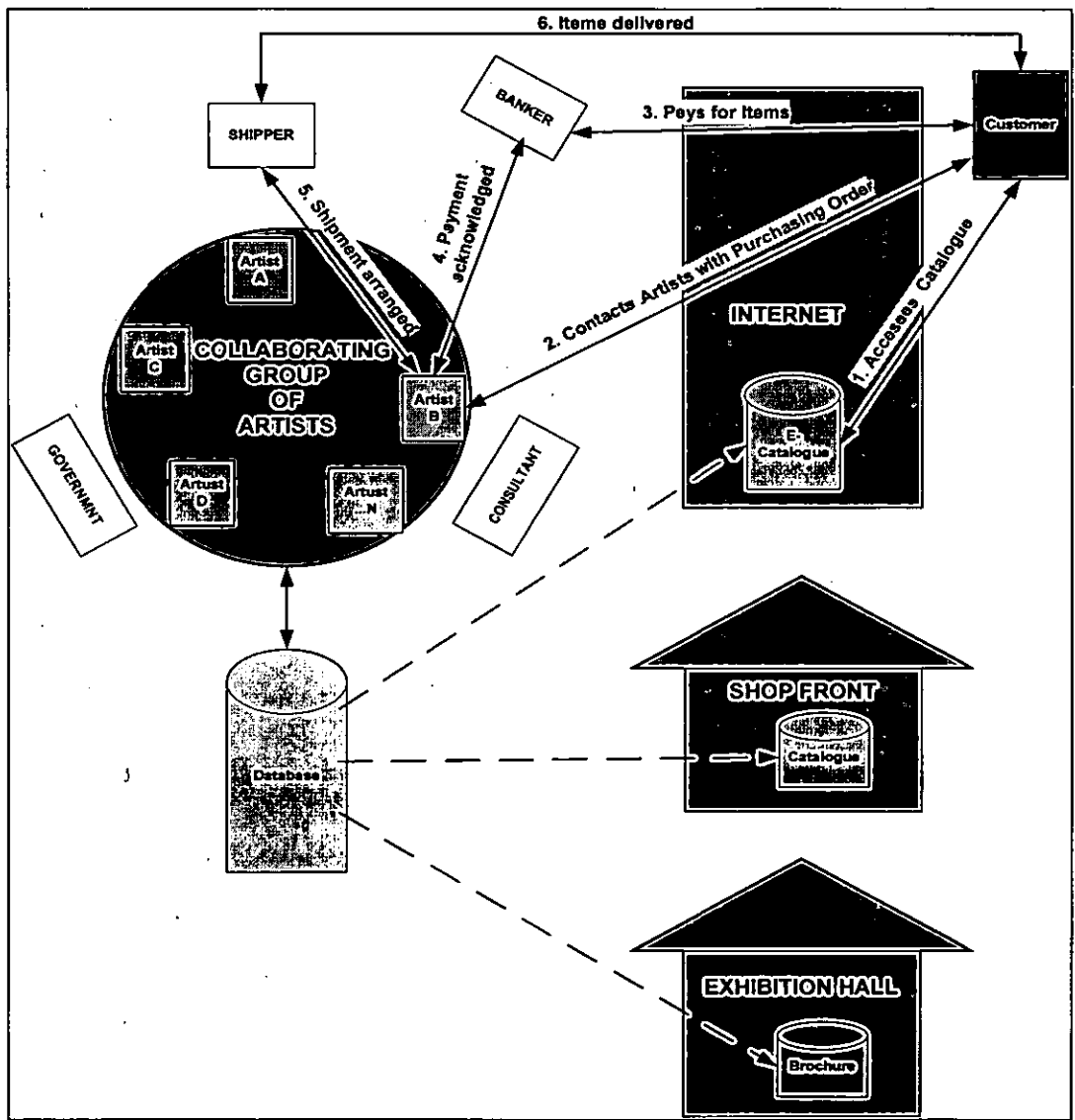
j)   Fig 1 is a simplified diagrammatic representation of the designed model. It shows the online relationships between the ARTIST GROUP members (like AKA, OKANGA, etc) and their CUSTOMERS. It also shows that there are four INTERMEDIARIES between the GROUP members and their CUSTOMERS.

They are: GOVERNMENT; BANKS; SHIPPERS; and CONSULTANTS. The GOVERNMENT makes and executes the laws governing E-Commerce relationships; BANKS receive and process payments on behalf of the GROUP members and their CUSTOMERS; SHIPPERS deliver the paid items to the CUSTOMERS; while CONSULTANTS maintain and upgrade the Website and other necessary technologies being used by the GROUP for E-Commerce activities.

ii)   Processes 1 to 6 describe how the relationships between the GROUP members and their CUSTOMERS develop from the time the CUSTOMERS see the art works contained in the E-Catalogue published online to the time they take delivery of the paid art works.

iii)   Furthermore, the diagram shows that while the online activities are still going on, the GROUP members can also maintain the other methods of conducting business through the traditional Shopfront (owned by individual members) and seasonal or annual joint Exhibitions.

iv)   From your understanding of the activities, processes and actors involved in Fig 1 and as described from numbers 1 to 3 above, please let us know your opinions in the following areas:

(Please insert 'X' or tick '√' where appropriate)

1. How would you rate your understanding of the activities/processes described in the diagram?
   a) Very High   ( )
   b) High   ( )
   c) Low   ( )
   d) Very Low   ( )

2. The processes as described in Fig 1 make some business sense to me.
   a) Very True   ( )
   b) True   ( )
   c) Untrue   ( )
   d) Very Untrue   ( )

3. From your understanding of the processes in the model, do you agree that the model is workable?
   a) Agree Strongly   ( )
   b) Agree   ( )
   c) Disagree   ( )
   d) Disagree Strongly ( )

4. It has been observed that foreign entrepreneurs are more likely to do business with small businesses (SMEs) in developing countries who have organised themselves as groups (like the one described in the diagram) than with SMEs operating individually.

    a) Agree Strongly   ( )

    b) Agree   ( )

    c) Disagree   ( )

    d) Disagree Strongly   ( )

5. How would you rank your willingness to participate in a group collaborative electronic commerce (E-Commerce) arrangement like the one described in Fig 1?

    a) Very High   ( )

    b) High   ( )

    c) Low   ( )

    d) Very Low   ( )

6. More SMEs in Nigeria would be willing to participate in E-Commerce if the technology to support this kind of collaborative arrangement is developed

    a) Strongly Agree   ( )

    b) Agree   ( )

    c) Disagree   ( )

    d) Strongly Disagree ( )

7. Given what you know about small business operations in your country, how would you rank the willingness of other small businesses like yours to participate in such group E-Commerce activities like the one described in Fig 1?

    a) Very Willing   ( )

    b) Willing   ( )

    c) Unwilling   ( )

    d) Very Unwilling   ( )

8. It has been observed that group endeavours (like the *ISUSO* contribution schemes in which members contribute money regularly to members on rotational basis to enable them solve some personal problems) have been a significant part of the Nigerian cultural way of sharing resources.

    a) Very True   ( )

    b) True   ( )

    c) Untrue   ( )

    d) Very Untrue   ( )

9. How accurate is the idea that SMEs in the country are willing to introduce this kind of cultural resource-sharing in their business activities?
   - a) Very accurate ( )
   - b) Accurate ( )
   - c) Inaccurate ( )
   - d) Very Inaccurate ( )

10. How willing are you to participate in an E-Business collaborative framework (like the one described in Fig 1) in which you share E-Commerce facilities with some other small businesses like yours?
    - a) Very Willing ( )
    - b) Willing ( )
    - c) Unwilling ( )
    - d) Very Unwilling ( )

11. Based on your knowledge of the level of resources available to small businesses in your country, how would you agree or disagree with the following statements?

Statement	Your Response			
	Strongly Agree	Agree	Disagree	Strongly Disagree
(a) More small businesses would be willing to share E-Business facilities with others.				
(b) More small businesses can afford to acquire E-Business technologies own their own.				
(c) Sharing E-Business facilities would attract more small businesses into online business.				
(d) Sharing E-Business facilities would be unattractive to small businesses.				

12. Please indicate which of the following facilities you would be willing to share with others. *(Please tick where appropriate)*

a) All E-Business facilities ( )
b) A joint Web site and some facilities ( )
c) A joint Web site only ( )
d) A joint database ( )
e) A joint E-Catalogue ( )
f) No E-Business facilities ( )

Thank you for completing this questionnaire.