UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

Demand-Side Factors Influencing the Adoption of Broadband for Small Business in Kenya: A Case Study of Cybercafés in Nairobi City

By:
KARIUKI, Joel Gachanja
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SUPERVISOR:
DR. MIRITI EVANS A.K.

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DECLARATION

This research project is my original work and has not been presented for a degree or any academic award in any other University or Institution.

Signed..... D a t e ……

Joel Gachanja Kariuki

P56/71394/2008

This research project has been submitted for examination to the University of Nairobi with my approval as the appointed supervisor.

Signed..... D a t e ……

Dr. Miriti Evans A.K.

Lecturer,

The School of Computing and Informatics,

University of Nairobi

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Finally, *asante sana* Sylvance, you are the wind beneath my wings. I have only been able to soar this high because of you.

DEDICATION

I dedicate this research work to my late mother, Wairimu.

You were everything to me, you are my inspiration;

My consolation in sorrow, for all the joy you brought to my life;

My hope in misery, I lost my faith, you gave it back to me;

My Strength in weakness, my strength when I was weak;

I am everything I am because of you.

Truly missed but your light still lives on Mum.

ABSTRACT

With an estimated fixed and mobile broadband penetration rate of 2 subscriptions per 100 people, Kenya still has significant progress to make with respect to broadband uptake. It has been noted that stimulating demand and usage by Kenyan citizens in both the public and private sectors remains a challenge. However, research on the demand-side factors influencing broadband uptake in Kenya is sparse. In view of the information gap regarding the demand-side factors underpinning broadband penetration in Kenya, this study seeks to investigate the demand-side factors as relates to small business in Kenya.

The study sought to investigate the demand-side factors influencing broadband internet adoption in Kenya. The specific objectives were: to determine the influence of perceived usefulness on the adoption of broadband by small businesses in Kenya; to determine the influence of perceived ease of use on the adoption of broadband by small businesses in Kenya; and to investigate the moderating role of IT self-efficacy on the adoption of broadband by small business owners.

Descriptive research design was used for the study. The target population entailed over 50,000 SMEs operating within Nairobi's Central Business District. A sample size of 100 owners of the cybercafé businesses was selected using systematic sampling technique. A structured questionnaire was used to collect data. Descriptive statistical techniques such as mean and percentage frequencies were established. Inferences were drawn using Spearman's Rank Correlation Coefficient technique, with alpha significant at 0.05 levels. The data was analyzed using SPSS.

The results showed that perceived usefulness was significantly correlated to broadband adoption. However, there was no correlation between perceived ease of use and adoption of broadband by small businesses in Kenya. In terms of the moderating role of IT self-efficacy, broadband adoption was significantly correlated to respondents' understanding of internet technical terms but not correlated to other dimensions of ICT self-efficacy. It was recommended that in order to enhance broadband penetration, last mile internet service providers should make available broadband connectivity at a price that majority of the customers targeted can buy. A study could be conducted on how broadband can be made affordable to SMEs in a sustainable manner.

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CCK	-	Communications Commission of Kenya (*now referred to as Communications Authority of Kenya*)
GDP	-	Gross Domestic Product
ICT	-	Information and Communication Technology
ISPs	-	Internet Service Providers
IT	-	Information Technology
PBC	-	Perceived Behavioural Control
SMEs	-	Small and Medium Enterprises
SPSS	-	Statistical Package for the Social Sciences
TAM	-	Technology Acceptance Model
TPB	-	Theory of Planned Behaviour
TRA	-	Theory of Reasoned Action
UAE	-	United Arab Emirates
UK	-	United Kingdom
US	-	United States of America

CHAPTER 1: INTRODUCTION

1.1 Background

The importance of broadband on economic development in the modern world cannot be overemphasized. According to the World Bank (2009), broadband has been one of the fastest-growing ICT services ever seen in terms of its diffusion worldwide. The World Bank records that Korea was the first country to deploy fixed line broadband on a commercial scale in the late 1990s. However, less than two decades later, more than 180 economies worldwide had launched broadband and global subscriber numbers had surpassed 500 million. Kelly and Rossotto (2012) commentated that due to their potentially wide-ranging impacts and ability to provide easier access to information that increases efficiencies and productivity in the economy, it is unsurprising that increased use of broadband networks and services has been found to produce positive outcomes that reverberate throughout a country, particularly involving GDP.

Drury (2011) estimated that raising broadband penetration in emerging markets to levels equivalent to those of Western Europe could add US$300 billion to $420 billion in gross domestic product and create 10 million to 14 million new jobs. Kelly and Rossotto (2012) however observed that despite the advances in broadband uptake, a "digital divide" remains between developed and developing countries as only 4.4% per 100 people in developing countries are broadband subscribers compared to 24.6% in developed countries. Particularly, Addo (2013) noted that as of the year 2013, broadband penetration in Africa was 0.3 percent and was expected to grow to 1.3% in the next five years.

Comparatively, South Africa and Ghana are in many ways ahead of East African countries in terms of ICT and broadband penetration, with South Africa leading the pack, followed by Ghana, Cameroon, Botswana and then Kenya, in that order (O'Neill, Noam and Gerbarg, 2014). Reddick (2010) however observed although South Africa has a well established infrastructure, it is only 0.65 percentage points ahead of Kenya in terms of internet penetration. In East Africa, Kenya and Uganda lead ICT use while Tanzania and Ethiopia follow (Stewart, 2005). Generally, an analysis by the World Bank (2009) concluded that high-speed international connectivity is currently a major constraint on the delivery of broadband services in Sub-Saharan Africa.

Kelly and Rossotto (2012) pointed out that despite the rapid growth in demand for broadband and the development of broadband-enabled applications, services and devices, there are also notable challenges. They particularly lamented that the more affluent and better-educated populations generally have had earlier and better access to ICTs than the less affluent and lesser educated people. They argued that, with the rise of broad-band enabled services and applications and the increasing migration of many aspects of modern life online, a lack of broadband connectivity can increasingly have a negative impact on social and economic developments by excluding those who lack broadband access or do not understand the relevance of broadband-enabled services.

1.1.1 Broadband Internet

Defining the term "broadband" has been the subject of on-going debate. Kelly and Rossotto (2012) are of the view that traditionally, broadband has often been defined in terms of data transmission speed. They however note that broadband speed definitions vary among countries and international organizations, generally ranging from download data transfer rates of at least 256kbits/s on the low end, as in India and South Africa to faster than 1.5MBits/s on the high end as in Canada. The World Bank (2009) however argues that conventional definitions of broadband focus on what it is not rather than what it is. For instance, they maintain that broadband is not narrowband, in that there is a general consensus on the low end cut-off speed for broadband as offering a transmission capacity equal to or above 256Kbps; but there is no upper limit placed on what broadband can become, and the evidence points to the fact that broadband speeds, and its performance/price ratio, are tending to double every 12-15 months. Some scholars and practitioners have however defined a minimum threshold for broadband at 256Kbps for downstream and 64Kbps for upstream (Maldoom, 2005).

Gaskin (2004) offers a technical definition of broadband and defines it as a transmission facility having the bandwidth to carry multiple data, voice and video channels all at once. The scholar adds that each of the individual channels is transmitted on a different frequency through the transmission medium (usually a wire of some type) and selected at the receiving end. Comparatively, Kelly and Rossotto (2012) view broadband more holistically as a high-capacity ICT platform that improves the variety, utility and value of services and applications offered by a wide range of providers, to the benefits of users, society and multiple sectors of the economy. Their definition is closer to the argument put

forward by Colao (2011) that broadband should be seen as the capability to deliver data and foster innovation, rather than a specific data transfer speed, and still less a specific technology. In other words, Colao argues that the definition of broadband has to be in terms of a capability that is "fit for purpose", not just in the immediate market context, but also in a dynamic context that allows capabilities to expand in line with user needs and changes in relative prices, as well as supply-side improvements and technical innovation.

On the demand side, broadband can be seen as a continuum ranging from information services with relatively modest bandwidth needs to those that are bandwidth intensive and involve real-time transmission (Colao, 2011). According to Maldoom (2005) broadband essentially provides users with always-on, high-speed connections to access the internet and transfer data. Thus, the term 'broadband' has outgrown original narrow definitions based on specific data transmission speeds and is now widely used simply as shorthand for high speed internet access. The Computer Science and Telecommunication Board (2002) notes that the term "broadband" has become commonplace for describing the future of digital communications.

In Kenya, the official definition adopted by the Communications Commission of Kenya (2013, p. 8) as provided in the National Broadband Strategy paper defines broadband as "connectivity that is always-on and that delivers a minimum of 5mbps to homes and businesses for high-speed access to voice, data, video and applications for development". This definition does not specify whether the threshold applies for downstream only or both downstream and upstream. However, it clearly sets the speed significantly high above those found in the definition of broadband on the higher end.

1.1.2 Demand Side

Computer Science and Telecommunication Board (2002) argues that defining the term "broadband" in some sense involves identifying the kinds of applications that consumers are likely to find useful and desirable and, determining the benefits that different segments of the public anticipate from access to broadband services. On the demand side, Maldoom (2005) speculated that the benefits to users of broadband relative to narrowband appear substantial, and are likely to increase for many users once they subscribe to broadband. The World Bank (2009) avers that demand stimulation has been a key

component of the policy framework in many of the countries that have been successfully developing broadband connectivity. Demand stimulation also has a positive feedback effect on the provision of broadband connectivity, since increased usage of computers results in increased demand for broadband connectivity and therefore more investment into the broadband segment of the market.

According to Maldoom (2005), broadband offers three main advantages over narrowband access: it decreases time costs, as an 'always on' connection provides instant access to the internet (whereas dial-up requires wait time and lines may occasionally be engaged) and higher bandwidth enables faster download of web pages and files. It enables access to high bandwidth applications, such as streaming video and real-time radio, home networking, customized internet video and audio libraries, interactive gaming and high-speed telecommuting. In addition, unlike narrowband, a broadband connection does not tie up a consumer's phone-line, allowing inbound and outbound voice calls.

1.2 Problem Statement

A study by Souter and Kerretts-Makau (2012) noted that Kenyans mostly access the internet through mobile phones and cybercafés and cybercafés are a particularly significant group of business that supply the internet in Kenya. These businesses offer customers different models of internet use from those available on mobile phones. For example, they are more suitable for watching video and for large downloads – and so remain significant modes of access for mobile internet users as well as those who do not use mobile internet. However, their business model is increasingly under threat. In spite of their importance in supplying the internet, particularly to lower-income users, they are not actively engaged in internet governance discussions, and the future of the cybercafé market is not raised in discussions by internet governance stakeholders.

A report by Drury (2011) revealed many unanswered questions concerning some initiatives in Kenya to increase broadband access through entrepreneurial cybercafés identified across peri-urban and rural communities. The questions included: Which services did villagers want or need most? How would villagers use these services? How much capability was required by each village? Which service model would be most successful in Kenya's culture and environment? And how would each digital village be set up and manned? These questions agree with the views of Kelly and Rossotto (2012)

that while studies undertaken on the importance of broadband provide useful insights into the growth effects of broadband, data collection and further systematic research and analysis in this area are needed, particularly for developing countries. Further, Pejovic et al. (2012) averred that sporadic attempts to bring broadband connectivity to isolated areas in the developing world have been made, but a comprehensive evaluation of the quality and the impact of such connectivity is often lacking.

Specifically, a report by Souter and Kerretts-Makau (2012) indicated that as of June 2012, the number of broadband subscriptions stood at 727,000, representing about 9.4% of total internet subscriptions. This compares unfavourably against the penetration rate of internet in Kenya which exceeded the 8 million mark in the same year (Communications Commission of Kenya, 2013). With an estimated fixed and mobile broadband penetration rate of 2 subscriptions per 100 people, Kenya still has significant progress to make with respect to broadband uptake. It has been noted that stimulating demand and usage by Kenyan citizens and the public and private sector remains a challenge. However, research on the demand-side factors influencing broadband uptake in Kenya is sparse. In view of the information gap regarding the demand-side factors underpinning broadband penetration in Kenya, this study seeks to investigate the demand-side factors as relates to small business in Kenya.

1.3 Objective of the Study

The general objective of the study was to determine the demand-side factors influencing broadband uptake among small businesses in Kenya. The study was guided by the following specific objectives:

i. To determine the influence of perceived usefulness on the adoption of broadband by small businesses in Kenya
ii. To determine the influence of perceived ease of use on the adoption of broadband by small businesses in Kenya
iii. To investigate the moderating role of IT self-efficacy on the adoption of broadband by small business owners.

1.4 Significance of the Study

Past research has shown that an overwhelming number of small business owners consider broadband internet access a significant, if not critical resource due to gains experienced from increased productivity meeting or exceeding the monthly cost of the service (Edwards, 2009). This study has both theoretical and practical value. In theory, the study adds to the body of knowledge concerning the application of Technology Acceptance Model to understanding of broadband internet adoption by small businesses. It explores the moderating role of ICT self efficacy on the adoption of broadband. In practice, the study would inform decisions concerning the marketing of broadband services to the small business sector in a developing country context such as Kenya. The findings could be used by key stakeholders such as internet service providers and the Communications Commission of Kenya (*now Communications Authority of Kenya*) to develop market driven broadband services in order to increase uptake of broadband internet in the country.

CHAPTER 2: LITERATURE REVIEW

2.1 Overview

In this chapter, a review of related literature is provided. The review discusses the various theories used to explain ICT adoption behaviours. Subsequently, an empirical review of past research related to broadband internet adoption is presented.

2.2 Theoretical Adoption Frameworks

Several theoretical frameworks have been proposed to explain the adoption of broadband for small business in Kenya. This study will be underpinned by three interrelated theories namely: the Theory of Planned Behaviour, the Theory of Reasoned Action and the Technology Acceptance Model.

2.2.1 The Theory of Reasoned Action

The Theory of Reasoned Action (TRA), developed by Martin Fishbein and IcekAjzen in their work in 1975 and 1980 drew from previous research that started out as the theory of attitude, which led to the study of attitude and behaviour (Dwivedi, Wade & Schnerberger, 2011). According to the authors, the theory was born chiefly out of dissatisfaction with traditional attitude-behaviour research, much of which found weak correlations between attitude measures and performance of volitional behaviours. The primary assumption of TRA is that human beings are usually quite rational and makes systematic use of information available to them (Mehdi, 2002). In his explanation of the theory (Figure 2.1), Mehdi (2002) specifies that a person's performance of a specific behaviour is determined by his behavioural intention to perform the behaviour. This intention is jointly determined by the person's attitude and subjective norm (beliefs and motivation) concerning the behaviour in question with relative weights estimated by the regression coefficients. Attitude towards behaviour is influenced by the person's salient beliefs about the consequences of performing the behaviour as well as the evaluation of those consequences.

Information communication and technology researchers often use this theory to study the determinants of IT innovation usage behaviour (Dwivedi et al., 2011). Although current models of technology acceptance have their roots in many diverse theoretical perspectives, much literature related to technology acceptance begins studies with the Theory of Reasoned action (TRA). A quick overview of existing research suggests that

the majority of contemporary technology adoption studies are rooted in behavioural intention, which contends that a user's choice to adopt a new technology is a conscious undertaking that can be sufficiently explained and predicted by their behavioural intention (Felipe & Green, 2005).

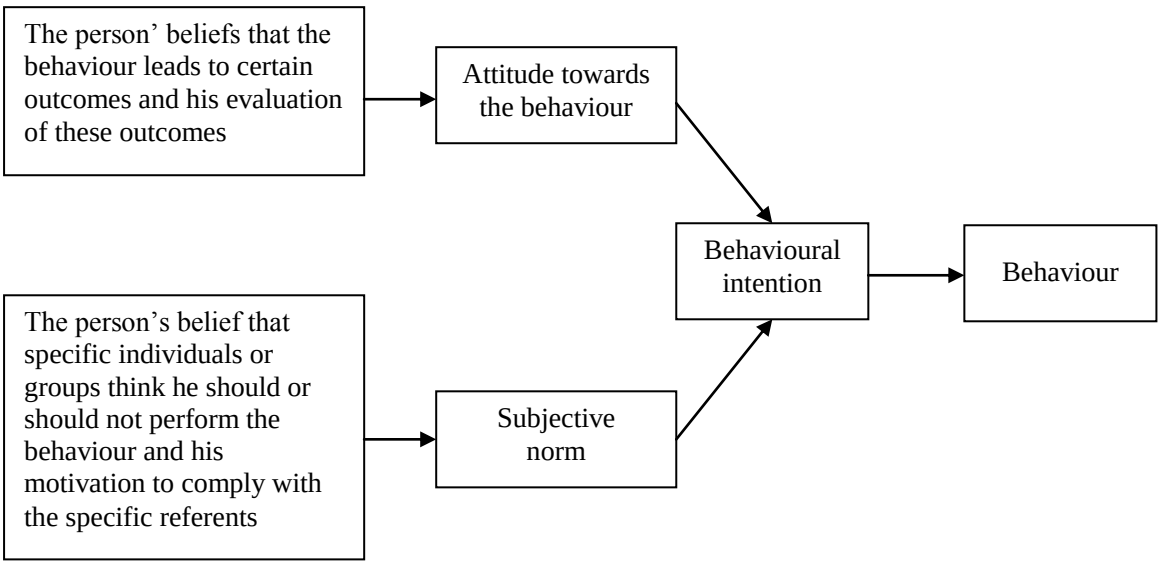

Figure 2.1 The Theory of Reasoned Action
Adapted from Mehdi (2002, p. 222).

2.2.2 Theory of Planned Behaviour

A limitation of TRA is its assumption that when someone forms an intention to act, he will be free to act without limitation, which in practice, is not true as constraints such as limited ability, time and environmental, facilitating or organisational conditions limit this freedom to act (Wunderlich, 2009). The theory of planned behaviour thus extends TRA to solve this limitation. TPB is a model of behavioural intentions developed by Fishbein and Ajzen in 1975 and it incorporates both attitudes and subjective norms that people hold in predicting their future behaviour (Steve, 2008).

Given that marketers are particularly keen on being able to predict the behaviour of their customers, the theory of reasoned action, along with its extension which is the theory of planned behaviour has been put to the test in a number of consumer situations including social networking behaviour (Hansen & Christensen, 2011). According to Smith et al.

(2008), TPB is one of the most influential and well-supported social psychological theories for predicting human behaviour.

The central premise of the theory is that behavioural decisions are not made spontaneously but are the result of a reasoned process in which behaviour is influenced, albeit indirectly, by attitudes, norms, and perceptions of control over the behaviour. The model proposes that attitude (the evaluation of the target behaviour such as the costs and benefits of such behaviour and outcome expectations), subjective norms (perceived social pressure regarding performance of the behaviour), and perceived behavioural control (perceived control over performance of the behaviour) influence behaviour primarily through their impact on behavioural intention. Hence, intention is seen as the proximal determinant of behaviour. Perceived behavioural control (PBC) is thought to have both a direct effect on behaviour and an indirect effect via intention (Vadlamani, 2007).

Applying TPB in an IT adoption context, intention to use IT is posited to influence an individual's subsequent IT usage, while fully mediating the influences of attitudes and subjective norms on subsequent IT usage. Moreover, perceived behavioural control also directly influences the intention to use IT, as well as ultimate IT usage (Baker, Al-Gahtani & Hubona, 2007). According to TPB, it is the perception of behavioural control, as opposed to the degree of actual behavioural control that directly impacts both intentions to perform behaviour, as well as the actual performance of that behaviour (Baker et al., 2007). The authors utilized the theory of TPB to predict intention to use computer technology in Saudi Arabia, while also examining the influences of potential moderating variables. Drawing from the TPB, this study sought to find out why the adoption of broadband internet was low among small businesses.

2.2.3 Technology Acceptance Model

Technology Acceptance Model (TAM) posits that a user's acceptance of information system is determined by the user's intention to use the systems, while perceived usefulness and ease of use can predict the usage intention, and perceived ease of use is hypothesized as a predictor of perceived usefulness (Frangos, 2009). TAM theorizes that the effects of external variables such as system characteristics, development process and training on intention to use are mediated by perceived usefulness and perceive ease of use.

Perceived usefulness is also influenced by perceived ease of use because, holding all other factors constant, the easier the system or technology perceived to be or is, the more useful it can be (Venkatesh & Davis, 2000). TAM relies on the theory of reasoned action, which posits that behaviour is logically processed in the following order: belief-attitude-intention-behaviour (Aleke, Ojiako and Wainwright, 2010). It also complements the theory of planned behaviour as beliefs and attitudes are a function of the constraints that bind consumer adoption of broadband.

Venkatesh and Davis (2000) concur that over the years, TAM has become well-established as a robust, powerful, and parsimonious model for predicting user acceptance. It is no surprise then that several researchers claim that the Technology Acceptance Model (TAM) is the most widely applied model of user acceptance and usage (Steve, 2008). In this study, TAM was adopted as the dominant theory that actually predicts adoption of broadband among small businesses in Kenya.

2.3 Empirical Review

According to the World Bank (2009), achieving widespread availability and use of broadband in Sub-Saharan Africa is likely to be a complex challenge, involving a number of interrelated factors. Choudrie and Dwivedi (2006) undertook an empirical investigation of the attitudinal and control factors influencing broadband adoption in private residences. The aim of their research was to identify the challenges in terms of demand that internet service providers face when deploying broadband. The study was conducted using a mail survey on a total of 172 household consumers from the London borough of Hillingdon. The study established that broadband adoption in the household was driven by relative advantages such as faster access, utility outcomes, such as the uses of broadband for work purposes, and hedonic outcomes such as the use of broadband for entertainment. The main factors for non-adopters were high costs and lack of needs.

Chetty et al. (2012) presented results from a qualitative study of households living with bandwidth caps which they defined as the limit on the amount of data users can upload and download in a month. Their findings suggested that home users grapple with three uncertainties regarding their bandwidth usage: invisible balances, mysterious processes and multiple users. Particularly, participants in their study did not appear to understand that YouTube or downloading songs used up significantly more bandwidth relative to

web browsing. Participants also did not comprehend how background or non-browser based activities consumed part of their monthly allotment.

Opicha (2013) investigated the determinants of performance of internet cyber cafes in Nairobi Province. Performance of the cyber cafes was measured by output per month in terms of total hours used on the internet by the customers and was regressed against explanatory variables. These explanatory variables included; monthly rent, cost of maintenance of computers per month, distance between the cyber cafes, age of the cyber cafe, total wages paid to the employees per month and the total hours of operation per month. The regression results revealed that rent (bigger space) was the most statistically significant variable in determining the performance of the cyber cafes. Other factors that significantly affect output are the age of the cyber cafe and total hours of operation.

Teresa (2011) studied the challenges facing cybercafés in Kenya and the strategies to use to cope with them so as to enable these businesses be more established. The study established that the challenges the cyber businesses were facing included stiff competition, pricing, connection, legislation, costs in running the business, illiteracy and general ignorance of clients. It was also noted that the clients of the cyber cafes have issues related to speed of the machines, congestion and a general lack of facilities within the cases. For example, Turan and Ramos (2009) lamented that broadband in Kenya costs twenty to forty times what it does in the United States. Connectivity for a small Business Process Outsourcing office with twenty calling stations now cost $17,000 per month, while similar offices in countries such as India, Malaysia, Mauritious, the UAE and China could provide the same capacity for $600-1000.

In Kenya, the fixed/wireless broadband internet market is dominated by a few internet service providers. Quarterly reports by the Communication Authority of Kenya (2014) revealed that as of June 2014, five companies controlled over 90% of the broadband internet market share as shown in table 2.1. The table shows that Zuku which is owned by Wananchi Telecom led the pack with 44.7% of the market share, followed by Liquid Telecoms (formerly Kenya Data Network) with 17.8%. Telkom Kenya and Access Kenya controlled 11.6% and 11.5% of the market share, respectively while Safaricom came fifth in the fixed broadband internet segment at 7.1%. The rest of the ISPs that included Jamii

Telecommunications, Iway Africa, Mobile Telephony Networks and Tangerine Limited shared the remaining 7.3%.

Table 2.1 Market share (Fixed Broadband Internet)

ISP	Market Share
Wananchi Telecom (Zuku)	44.7%
Liquid Telecoms	17.8%
Telkom Kenya	11.6%
Access Kenya	11.5%
Safaricom	7.1%
Others	7.3%

Source: Communication Authority of Kenya (2014)

According to Pejovic, Johnson, Zheleva, Belding & Stam (2012), the cost of broadband puts internet access into perspective with other basic necessities. Broadband connectivity requires up to a few hundred times proportionally higher investment from a user who lives in the developing world than from a user who lives in the developed world. Souter and Kerretts-Makau (2012) gave examples of the price of monthly access available from a number of ISPs as at April 2012 as given in table 2.2. The charges are relatively similar to those identified by Waema, Adeya and Ndung'u (2010) who provided that the commercial broadband bandwidth cost of 256kbps for Safaricom and Kenya Data Network in the year 2010 was 12,500/= and 12,000/= respectively, per month. The high cost of broadband connection is consistent with the view that the price of internet service is an important factor in determining usage levels, particularly for lower-income groups (Souter & Kerretts-Makau, 2012).

Table 2.2 Sample Broadband Internet Charges in Kenya

Company	Package	Speeds	Pricing
Africa Online Kenya	InfiNet Pro	Up to 256 Kbps speeds (Max)	Monthly charge of 19,999/- + 16% VAT
Orange Kenya	Broadband Turbo	Up to 512kbps downloads and 128kbps uploads per month	Kes. 10,999/- per month

Source: SoutER & Kerretts-Makau (2012, p. 15)

Quarterly statistical reports provided by the Communication Authority of Kenya (2014) showed that 1mpbs speed is the most popular amongst subscribers. Table 2.3 shows information on pricing advertised on the websites of four internet service providers controlling over 90 percent of the fixed data internet market. The table shows that Telkom Orange had the cheapest broadband connection at speeds of 1mbps with subscribers linked using ADSL technology. Jamii Telecoms' Faiba followed next with an offer of 10mbps at Kshs.10,000. However, it should be noted that some of these connections are shared, meaning that the availability of bandwidth purchased is subject to traffic. Safaricom's 1mbps duplex capacity was the most expensive, tripling the rate offered by Telkom Orange. These offers also differed wildly in upstream capacities.

Table 2.3 Fixed Broadband Internet Pricing as at December 2014

ISP	**Monthly Price per 1Mb (Ksh)**	**Comment**
Wananchi Telecom (Zuku)	20,000*	*with a cheaper option for shared capacity
Liquid Telecoms	16,000	
Telkom Kenya	15,000	
Access Kenya	10,000	
Safaricom	17,000	
Others	19,000**	*average price

Source: Author (2014)

A report by Waema et al. (2010) noted that initial commercial prices for the Seacom cable bandwidth have been quoted between US$400 to US$500 per Mb/s per month. The report noted that although the wholesale internet prices have been reduced slightly, the retail prices appear to be stuck at previous satellite costs. Most Internet Service Providers have offered hope of lower prices in the future, but have thus far only offered increased bandwidth for the same price, and have not reduced entry-level prices.

Mugeni, Wanyembi and Wafula (2012) undertook a pilot study aimed at providing an initial understanding of the factors affecting broadband readiness in a developing country like Kenya. They identified and examined various policy, regulatory, access technology, digital literacy, broadband demand and broadband supply side factors and their possible

influence upon broadband readiness in Kenya. Their findings suggested that availability of a national broadband strategy, improvement in digital literacy, use of private public partnerships in the provision of broadband, provision of broadband connections to government, learning and health institutions, inclusion of broadband in universal service obligations and improvement in the security of broadband connections were significant factors for improving broadband readiness of Kenya. Specifically, the demand side construct had the highest impact on explaining the variance in broadband readiness in Kenya. However, the scope of their measurement of demand side construct included security of broadband connections, development of local content, e-government applications, adoption of broadband by businesses, establishment of digital villages, tax exemption on all ICT products and government facilitation of internet connections to Government, Health facilities and Educational institutions.

Pejovic et al. (2012) investigated the obstacles to efficient broadband adoption in rural Sub-Sahran Africa through a network traffic analysis and social surveys. Their findings showed that location of access, connectivity speeds, and the cost of the connection together with the overall context in which the usage happens severely impacts online behaviour. Consumer surveys suggest that consumers do attach significant benefits to time savings provided by broadband. For example, a survey undertaken in the UK found that 41% of UK internet users considered "faster internet experience" to be the main advantage of broadband (Maldoom, 2005).

Waema and Katua (2013) analyzed the impact of fiber optic broadband connectivity and related technologies on the tourism value chain in Kenya. Their findings showed that broadband internet and related ICTs have brought about varying changes in the bargaining powers of both suppliers and customers, changed the basis of rivalry among existing competitors and reduced barriers to entry for new players.

A report by Maldoom (2005) suggested that consumer demand for much of the additional content and services available over broadband remains unproven in most OECD countries. However, demand for applications remains 'sticky' in that once consumers adopt broadband and begin using advanced functionalities such as web-browsing speeds equivalent to turning a page of a book, they value broadband more than they did when they first adopted.

2.4 Summary of Literature Review

The literature has reviewed the theories commonly applied in ICT related research such as broadband adoption. The theories reviewed, namely the theory of Planned Behaviour, the Theory of Reasoned Action and Technology Acceptance Model complement one another to provide a solid framework for the current study. The empirical literature on the other hand has provided several pointers to the potential factors influencing the demand for broadband internet by consumers. However, the demand-side construct, as it relates to cybercafés has not been explored. Therefore, there was need to undertake a study specifically addressing the question of low uptake of broadband internet among cybercafé businesses.

2.5 Conceptual Model

The following conceptual model supported by three interrelated theories namely the Theory of Planned Behaviour, the Theory of Reasoned Action and the Technology Acceptance Model depicts the relationship between the dependent and independent variables as defined above. In the model, perceived usefulness and perceived ease of use are represented as the independent variables whereas broad-band adoption is the dependent variable. In between, ICT self-efficacy is predicted as the intervening variable.

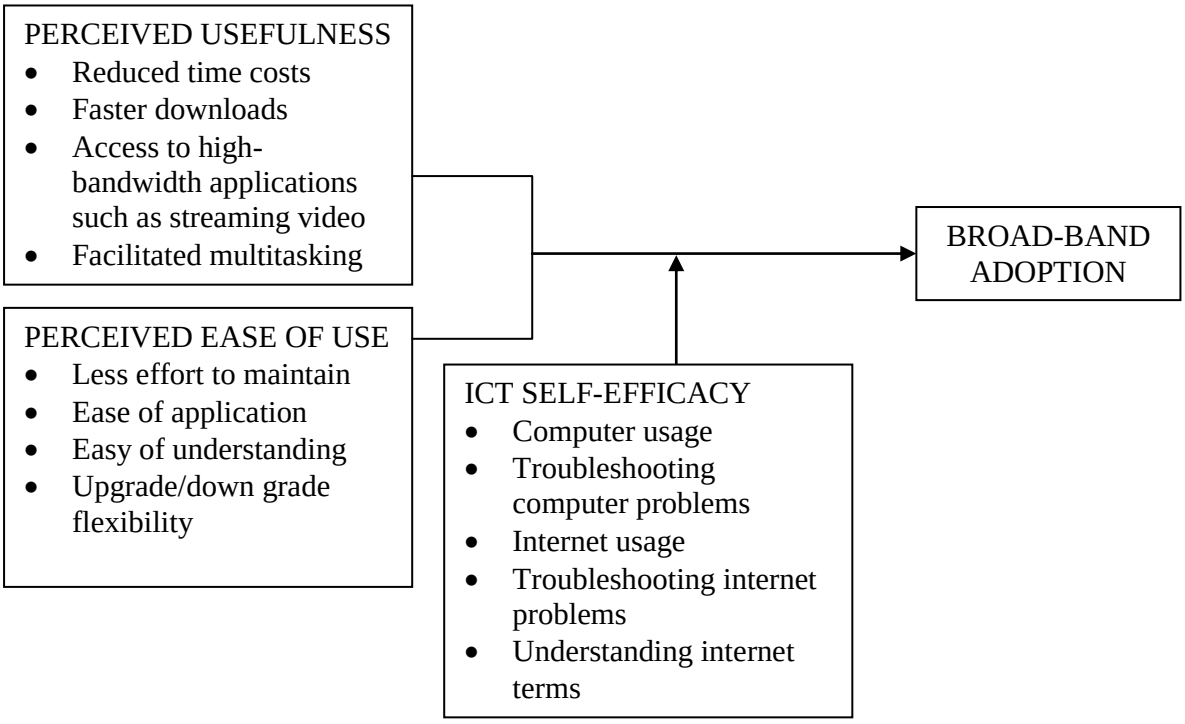

Figure 2.2 Conceptual Model

Drawing from TRA and the empirical literature, perceived usefulness depicts the respondent's beliefs that the behaviour (adoption of broadband) leads to certain outcomes and his evaluation of these outcomes. From the literature review, the outcomes of broadband adoption include benefits such as reduced time costs, faster downloads, access to high-bandwidth applications such as streaming video, and the ease of multitasking. Respondents' evaluation of these outcomes is expected to shape their beliefs about broadband internet and therefore determine the attitude they hold towards broadband internet.

Drawing from TAM, perceived ease of use is another independent variable that should influence both attitudes and intentions of respondents to adopt broadband internet. In this case, ease of use is given by perceptions that broadband internet requires less effort to maintain, it is easy to understand, apply as well as upgrade or downgrade to suit the individual's needs.

As explained by the TPB, perceived control over performance of the behaviour is thought to have both a direct effect on behaviour and an indirect effect via intention. In this case, ICT self-efficacy is given as potential constraints that limit the freedom of respondents to adopt broadband internet. From the literature review, this potentially manifests in the form of computer usage ability, ability to trouble-shoot computer problems, self-efficacy in terms of internet usage as well as understanding internet terms and troubleshooting internet problems.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The general objective of the study is to determine the demand-side factors influencing broadband uptake among small businesses in Kenya. This chapter describes the methodology that was adopted for the study. The chapter explains the research design, population, sample and sampling method, data collection method and data analysis techniques that was used.

3.2 Research Design

Descriptive research design was used for the study. Descriptive research design entails measuring a set of variables as they exist naturally (Cooper & Schindler, 2005; Gravetter & Forzano, 2011). According to Denscombe (2003), the emphasis of this research design is on producing data based on real world observation through a purposeful and structured approach. Inferences concerning the study variables can be drawn from variations of independent and dependent variables (Polit & Beck, 2001). In this study, the use of descriptive research design was applied in order to draw inferences about the relationship that exist between perceived ease of use, perceived usefulness and ICT self-efficacy on adoption of broadband among small businesses in Kenya.

3.3 Population of the Study

Denscombe (2003) defines a population as the collection of all units of a specified type at a particular point or period of time. A study conducted on small business enterprises in Kenya by Nyakundi, Nyamita and Tinega (2014) revealed that Kenya has over 1.6 million registered small and medium enterprises which constitute 96 percent of all business enterprises in the country. The target population in this study entailed all cybercafé businesses operating within Nairobi's Central Business District. A previous study by Kiruja (2011) suggested that there were an estimated 50,000 SMEs operating within the Nairobi Central Business District.

3.4 Sample and Sampling Method

3.4.1 Sample Size

A sample is defined simply as a section of a part that represents the larger whole (Saunders et al., 2009). Denscombe (2003) argues that an adequate sample size depends on several issues. Sekaran and Bougie (2010) considers a rule of thumb in social research which states that "sample sizes larger than 30 and less than 500 are appropriate for most research". This is also supported by Denscombe (2003) who argues that the normal requirement for sample size in social science is 30 to 100. Therefore, this study was based on a survey of 100 cybercafés. The sampling unit was the cybercafé owners/managers.

3.4.2 Sampling Method

The study used systematic sampling method. Systematic sampling involves movement through the sampling frame and selection of every fixed number of cases (Vanderstoep & Johnson, 2009). According to Taylor (2005), this sampling technique arranges individuals in the population in some logical order from which a list of random numbers may be used to select the samples needed. Rao and Richard (2006) argue that this method is simpler and much more convenient than random or stratified sampling since the need for preparing a frame for selection is avoided. . The sample interval (*k*) was determined as follows:

$$k = \frac{\text{Population size}}{\text{Sample size}}$$

3.5 Data Collection Method

A structured questionnaire was used to collect data. The questionnaire comprised of Likert scale questions. Stangor (2010) contends that a Likert scale consists of a series of items that indicate agreement or disagreement with the issue that is to be measured, each with a set of responses on which the respondents indicate their opinions. According to McNabb (2008) Likert scales aim to measure the extent of a respondent's agreement with each item on a five-point scale namely, strongly agree, agree, undecided, disagree and strongly disagree; with the items assigned values from 1 through to 5 in that order. The questionnaire was made of four sections. The first section sought general information from the respondents such as formal ICT training, tenure in the business, ISP used, the

bandwidth subscription size, broadband subscription, among others. The second section comprised of questions related to perceived ease of use of broadband. The third section addressed questions regarding perceived usefulness of broadband. The last section was made up of questions testing ICT self-efficacy.

3.6 Data Analysis Techniques

The procedure for data analysis involved first coding the data into the statistical package for the social sciences (SPSS). The raw data was entered into the software for analysis. Data analysis involved establishing relationships using cross-tabulation analysis and Spearman's rank correlation techniques. According to Saunders et al. (2009), cross-tabulation is a statistical process for establishing interrelationships between categorical data that is data that simply refer to classification of respondents sharing similar characteristics. Acock (2009) suggests that in a cross-tabulation, if you have one variable that depends on the other, you usually put the dependent variable as the column variable and the independent variable as the row variable and vice versa. Spearman's rank correlation coefficient is a statistic which is used to measure the relationship of paired ranks assigned to individual scores on two variables. It is an index of the strength of association between the variable ranges from 0 (no association) to + 1.00 (perfect association). A perfect positive association (r =+1.00) would exist if there were no disagreements in ranks between the two variables. A perfect negative relationship (r = -.100) would exist if the ranks were in perfect disagreement (Healey, 2011). This technique was used to draw inferences on the relationship between perceived ease of use, perceived usefulness and adoption of broadband internet.

3.7 Summary

This chapter has detailed the methodology that was used to undertake the study. The chapter has detailed the research design, the population and sampling design including the sampling technique and sample size. It has also described the data collection methods and explained the data analysis tools and techniques to be used. Chapter four presents the analysis oand discussion of findings whereas chapter five provides the conclusions and recommendations.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1 Overview

The general objective of the study was to determine the demand-side factors influencing broadband uptake among small businesses in Kenya. In this chapter, the data is analyzed and the results discussed. The chapter begins by presenting the descriptive analysis of respondents' demographics. The rest of the chapter is divided into four sections based on the specific objectives. The first section analyzes the influence of perceived usefulness on the adoption of broadband by small businesses in Kenya. The second section presents the analysis of the influence of perceived ease of use on the adoption of broadband by small businesses in Kenya. The last section analyzes and discusses the moderating role of IT self-efficacy on the adoption of broadband by small business owners. Out of 100 questionnaires administered, a total of 99 questionnaires were successfully filled and returned. Thus, the response rate was 99% as shown in table 4.1.

Table 4.1 Response Rate

Response rate	Distribution	
	Frequency	Percentage
Responded	99	99.0
Did not respond	1	1.0
Total	100	100.0

4.2 Descriptive Statistics of General Information

The statistics related to general information that was obtained from the respondents included how long they had operated their cybercafé business, number of employees, number of functional computer work stations, average occupancy rate, business growth and internet bandwidth downstream used. The findings are presented as follows:

4.2.1 Tenure in the Cybercafé Business

The study sought to determine how long respondents had operated their cybercafé business. Table 4.2 shows that 55.4% of the respondents had operated their cyber business for more than 5 years, followed by 26.3% of the respondents who had been in the business for between 2 to 5 years, and 15.2% of the respondents having been at it for

1 to 3 years. Lastly, 3.1% of the respondents had operated their cybercafé business for less than a year. Therefore, majority of the cybercafés had been in operation for more than 5 years, suggesting that they have accumulated adequate years for organizational learning and experience in the industry.

Table 4.2 Years Respondent has operated their Cybercafé

Tenure in Years	Distribution	
	Frequency	Percentage
Less than 1 year	3	3.1
1 to 3 years	15	15.2
2 to 5 years	26	26.3
More than 5 years	55	55.4
Total	99	100.0

4.2.2 Number of Employees

The distribution of cybercafés by number of employees is shown in table 4.3. The table shows that 56.6% of the cybercafés surveyed had 3 employees and 31.3% had more than 3 employees. This was followed by 11.1% of the cybercafés that had 2 employees and some 1% of the cybercafé businesses had 1 employee. Therefore, majority of the cybercafés had not more than three employees, suggesting that in terms of size, most, if not all of the cybercafés were micro enterprises.

Table 4.3 Distribution of Cybercafés by Number of Employees

Number of employees	Distribution	
	Frequency	Percentage
1 employee	1	1.0
2 employees	11	11.1
3 Employees	56	56.6
More than 3 employees	31	31.3
Total	99	100.0

4.2.3 Number of Functional Computer Workstations

The study sought to determine the number of functional computer workstations that the cybercafé businesses operated on. Table 4.4 shows that majority (51.5%) of the cybercafés had between 11-20 functional computer workstations and 32.3% of the respondents had between 21-50 workstations. 15.2% had between 5 to 10 computers whereas 1% of the cybercafés surveyed had more than 50 computer workstations. Therefore, majority of the cybercafés surveyed had more than 10 functional computer workstations.

Table 4.4 Number of Functional Computer Workstations

Number of computer workstations	Distribution	
	Frequency	Percentage
5 to 10	15	15.2
11-20	51	51.5
21-50	32	32.3
More than 50	1	1.0
Total	99	100.0

4.2.4 Occupancy Rate on Workstations

Respondents were asked to estimate the average occupancy rate in any one hour at their cybercafé. Table 4.5 shows that 56.6% of the respondents said that more than half of their computers were occupied. Thirty percent (30.3%) of the respondents however indicated that just over a third of their computers were occupied. Further, 11.1% of the respondents said that less than a quarter of their computer workstations were occupied whereas 2.0% of the respondents claimed that all their computers were always occupied. The findings imply that there was demand for internet browsing services at the cybercafés. This is consistent with the view that besides mobile phones, Kenyans mostly access the internet through cybercafés, making cybercafés a particularly significant group of business that supply the internet in Kenya (Souter and Kerretts-Makau, 2012).

Table 4.5 Average Occupancy Rate on Workstations

Average occupancy rate	Distribution	
	Frequency	Percentage
All computers are always occupied	2	2.0
More than half of the computers are occupied	56	56.6
Just a third of the computers are occupied	30	30.3
Less than a quarter of the computers are occupied	11	11.1
Total	99	100.0

4.2.5 Growth Status of Cybercafé

The distribution of respondents with regards to the growth status of their cybercafés is shown in table 4.6. The table shows that 80.8% of the respondents observed business growth whereas 15.2% evaluated their businesses as stagnant. Some 4.0% of the respondents reported that their businesses were in a declining state. Therefore, majority of the cybercafés reportedly recorded business growth.

Table 4.6 Number of Functional Computer Workstations

Growth status	Distribution	
	Frequency	Percentage
Growing	80	80.8
Stagnated	15	15.2
Declining	4	4.0
Total	99	100.0

4.2.6 Internet Bandwidth used by the Cybercafé

The distribution of cybercafés by the size of downstream bandwidth they used is shown in table 4.7. The table shows that respondents that used bandwidth of between 1-4Mbs were the majority at 43.4%, followed by respondents who used 256-512Kbps at 36.4%. Respondents using 5Mbps and above were 18.2% whereas some 2.0% of the respondents indicated that their downstream bandwidth size was less than 256Kbps. These results suggest that majority of the respondents operated with some level of broadband capacity consistent with some of the definitions of broadband internet provided by scholars such as Kelly and Rossotto (2012) and Maldoom (2005) which puts the threshold at download data transfer rates of 256kbps. However, the findings suggest that, based on the 5Mbps

minimum threshold which forms the official definition of broadband adopted by the Communication Commission of Kenya (2013) as outlined in the National Broadband Strategy Paper, the majority of cybercafés in this survey did not have broadband internet.

Table 4.7 Internet Bandwidth Downstream Capacity

Bandwidth	Distribution	
	Frequency	Percentage
Less than 256 kbps	2	2.0
256-512 kbps	36	36.4
1-4 Mbps	43	43.4
5 Mbps and above	18	18.2
Total	99	100.0

4.2.7 Broadband versus Occupancy

Based on the official definition of broadband internet, according to the Communication Authority of Kenya which puts the minimum threshold of 5mbps, the study sort to determine the relationship between broadband internet and occupancy rate at the sampled cybercafés.

Table 4.8 Broadband versus Occupancy rate

	Broadband	Without broadband
All computers always occupied	2.6%	0.0%
More than half of the computers are occupied	62.8%	33.3%
A third of the computers are occupied	25.6%	47.6%
Less than a quarter of the computers are occupied	9.0%	19.0%
Total	100.0%	100.0%

Table 4.8 compares the occupancy rate of workstations in the cybercafés that had broadband connectivity and those that did not. The table shows that the proportion of cybercafés which had more than half of their computers occupied at any one time was higher at 65.4% for those with broadband internet compared to the proportion of cybercafés that did not have broadband internet (33.3%).

4.3.8 Broadband versus Business Growth

The study sought to determine whether there was any relationship between broadband internet (5mbps) and business status of business.

Table 4.9 shows that although majority of cybercafés in either categories realized growth, the proportion of cybercafés posting growth that had broadband internet was higher at 95.2% compared to the proportion of cybercafés that did not have broadband (that is, those that had less than 5mbps internet speeds) at 76.9%.

Table 4.9 Broadband versus Business Growth

	Broadband	Without broadband
Indicated business growth	95.2%	76.9%
Indicated business was stagnant	4.8%	17.9%
Indicated business decline	0.0%	5.2%
Total	100.0%	100.0%

4.3 The Influence of Perceived Usefulness on the Adoption of Broadband

In this section, the findings concerning the influence of perceived usefulness on the adoption of broadband internet are analyzed. Spearman's Rank Correlation Coefficient was run to establish the correlation between the study variables, with alpha significant at 0.05 levels. Table 4.10 shows that a statistically significant relationship existed between broadband adoption and perceived value for money ($r=.287$, $p<.01$), reduced time costs ($r=.263$, $p<.01$), affordability ($r=.282$, $p<.01$), speed ($r=.222$, $p<.05$), streaming ($r=.233$, $p<.01$). The positive correlation between broad-band adoption and perceived value for money suggest that adoption increased with increased customer perception that broadband returned value for money. This agrees with a study by Maldoom (2005) which observed that once consumers adopt broadband and begin using advanced functionalities such as web-browsing speeds equivalent to turning a page of a book, they value broadband more than they did when they first adopted.

The direct and statistically significant relationship between broadband adoption and reduced time costs imply that as the amount of time spent on broadband internet connectivity reduced, uptake of broadband increased. This is related to the subsequent

correlation established between broadband adoption and internet speeds as well as the fun of streaming videos and downloading applications. The results are in concert with the findings of a survey by Pejovic et al. (2012) which established that adoption of broadband in Sub-Sahara was influenced by connectivity speeds, among others, connectivity speeds. Similarly, the correlation results imply that adoption of broadband increased with increased affordability. However, the correlation between broadband adoption and always on connection was not statistically significant (r=.051, p>.05), meaning that no relationship subsisted between broadband adoption and always on connectivity.

Table 4.10 Correlation between Perceived Usefulness and Broadband Adoption

Spearman's Rho			1
1	Broadband adoption	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	99
2	Value for money	Correlation Coefficient	.287(**)
		Sig. (2-tailed)	.004
		N	99
3	Reduced time costs	Correlation Coefficient	.263(**)
		Sig. (2-tailed)	.009
		N	98
4	Affordability	Correlation Coefficient	.282(**)
		Sig. (2-tailed)	.005
		N	98
5	Fast speed	Correlation Coefficient	.222(*)
		Sig. (2-tailed)	.030
		N	99
6	Streaming	Correlation Coefficient	.233
		Sig. (2-tailed)	.046(*)
		N	99
7	Always on	Correlation Coefficient	.051
		Sig. (2-tailed)	.613
		N	99

*Correlation significant at 0.05 levels
**Correlation significant at 0.01 levels

The descriptive statistics of each variable is further presented and discussed as follows:

4.3.1 Value for Money

The study sought to determine whether respondents perceived broadband subscription as a worthwhile investment. Table 4.11 shows that 52.5% of the respondents agreed and 16.2% strongly agreed that broadband subscription was a worthwhile investment.

However, 29.3% of the respondents were neutral whereas 2.0% of the respondents disagreed. Therefore, majority of the respondents agreed that broadband internet was a worthwhile investment, suggesting that it offers value for money. This agrees with the depiction of broadband internet by Kelly and Rossotto (2012) as a high-capacity ICT platform that, among others, improves utility and value of services and applications offered by a wide range of providers, to the benefits of users and society.

Table 4.11 Perception of Broadband Subscription as a Worthwhile Investment

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	2	2.0
Neutral	29	29.3
Agree	52	52.5
Strongly agree	16	16.2
Total	99	100.0

4.3.2 Time Costs

The views of the respondents were sought as to whether broadband internet significantly reduced time costs. Table 4.12 shows that 55.6% of the respondents agreed that broadband internet significantly reduced time costs and another 10.1% of the respondents strongly agreed. However, there were 29.3% of the respondents who were neutral whereas 4.0% of the respondents disagreed. Therefore, majority of the respondents observed that broadband internet reduced time costs. This is consistent with the views of Maldoom (2005) who viewed decreased time cost as one of the main advantage it had over narrowband access.

Table 4.12 Broadband Reduction of Time Costs

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0.0	0.0
Disagree	4	4.0
Neutral	29	29.3
Agree	56	55.6
Strongly agree	10	10.1
Total	99	100.0

4.3.3 Affordability

The question sought to establish from the respondents whether they perceived broadband internet fees as affordable. Table 4.13 shows that 35.7% and 13.3% of the respondents disagreed and strongly disagreed, respectively. However, 37.8% of the respondents were neutral whereas 13.3% of the respondents agreed. The finding shows that on aggregate, most (49.0%) of the respondents disagreed suggesting that respondents felt that broadband internet fees were not affordable. This is in agreement with the findings in a report by Waema et al. (2010) which noted that although the wholesale internet prices have been reduced slightly, most Internet Service Providers have offered hope of lower prices in the future, but have thus far only offered increased bandwidth for the same price, and have not reduced entry-level prices. This brings to the fore, the need for broadband service providers to offer broadband connectivity at prices which cybercafés can afford to buy.

Table 4.13 Broadband Internet is Affordable

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	13	13.3
Disagree	35	35.7
Neutral	38	37.8
Agree	13	13.3
Strongly agree	0	0.0
Total	99	100.0

4.3.4 Internet Speed

The opinion of respondents was sought as to whether they perceived that broadband connection provided very fast downloads which was good for their business. Table 4.14 shows that 57.6% of the respondents agreed and another 9.1% strongly agreed. However, 32.3% of the respondents were neutral whereas 1.0% of the respondents disagreed. Therefore, majority of the respondents perceived that broadband provided very fast downloads. This agrees with past consumer surveys undertaken in the UK as reported by Maldoom (2005) which established that faster internet experience was considered to be the main advantage of broadband.

Table 4.14 Broadband Provides Very Fast Downloads

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	1	1.0
Neutral	32	32.3
Agree	57	57.6
Strongly agree	9	9.1
Total	99	100.0

4.3.5 Streaming Videos/Download Applications

Respondents were also asked whether it was exciting to stream video/download applications using broadband thanks to its high speed. Table 4.15 shows that 57.6% and 11.1% of the respondents agreed and strongly agreed, respectively, that it was exciting to stream video/download applications through broadband. The table also shows that 31.3% of the respondents were neutral. Therefore, majority of the respondents agreed that it was exciting to stream video or software applications using broadband.

Table 4.15 Fun Experience Streaming Videos/Download Applications

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	31	31.3
Agree	57	57.6
Strongly agree	11	11.1
Total	99	100.0

4.3.6 Always-On Connectivity

Respondents were also asked whether with broadband, there are no downtimes. Table 4.16 shows that 51.5% of the respondents were neutral. However, 29.3% and 4.0% of the respondents agreed and strongly agreed, respectively, whereas 14.1% and 1.0% of the respondents disagreed and strongly disagreed, respectively. The results suggest that most of the respondents were non-committal about broadband offering always-on connectivity. Using CCK (2003) definition as a reference point, it can be said that the cybercafés did not experience broadband internet.

Table 4.16 Always-On Connectivity

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	1	1.0
Disagree	14	14.1
Neutral	51	51.5
Agree	29	29.3
Strongly agree	4	4.0
Total	99	100.0

4.3.8 Multi-tasking Capacity

In terms of whether broadband internet enables users to multi-task hence attracting more customers to the cybercafé, Table 4.17 shows that 63.6% of the respondents agreed and 20.2% strongly agreed. However, 15.2% of the respondents were neutral whereas 1.0% of

the respondents disagreed. The findings imply that on aggregate, majority of the respondents broadband connection allowed for multi-tasking, a finding which is also related to the question of internet speed.

Table 4.17 Scope for Multi-tasking Online

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	1	1.0
Neutral	15	15.2
Agree	63	63.6
Strongly agree	20	20.2
Total	99	100.0

4.4 The Influence of Perceived Ease of Use on the Adoption of Broadband

In this section, perceived ease of use variables was correlated with broadband adoption to establish whether the relationship was statistically significant. The results are shown in Table 4.18. The table shows that there was no statistically significant correlation between broadband adoption and maintenance effort (r=.143, p>.05), ease of operation (r=.035, p>.05), ease of understanding technical terms (r=.157, p>.05) and ease of upgrading (r=.068, p>.05).

The lack of correlation suggests that perceived ease of use did not influence broadband adoption. This, at face value, seems to contradict the theory of TAM which hypothesize perceived ease of use can predict usage intention (Venkatesh & Davis, 2000). One explanation that can be given for this outcome is that the influence of perceived ease of use of broadband does not stand alone, but works in concert with perceived usefulness to influence adoption of technology. It means that it is one thing to perceive an innovation or technology as easy to use but quite another to adopt it in the absence of a confounding variable such as perceived usefulness. This argument finds support from previous scholars such as Venkatesh and Davis (2000) who assert that perceived usefulness is influenced by perceived ease of use because, holding all other factors constant, the easier the system or technology perceived to be or is, the more useful it can be.

Table 4.18 Correlation of Perceived Ease of Use and Broadband Adoption

	Spearman's Rho		1
1	Broadband adoption	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	99
2	Maintenance effort	Correlation Coefficient	.143
		Sig. (2-tailed)	.157
		N	99
3	Ease of operation	Correlation Coefficient	.035
		Sig. (2-tailed)	.731
		N	99
4	Ease of understanding technical terms	Correlation Coefficient	.157
		Sig. (2-tailed)	.120
		N	99
5	Ease of upgrading	Correlation Coefficient	.098
		Sig. (2-tailed)	.336
		N	99

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

4.4.1 Maintenance Effort

The views of respondents were sought as to whether broadband internet took less effort to maintain. Table 4.19 shows that 50.5% and 9.1% of the respondents agreed and strongly agreed, respectively. However, 38.4% of the respondents were neutral and 2.0% of the respondents disagreed. Therefore, most of the respondents agreed that broadband internet required less effort to maintain. This potentially increased respondent's intention to adopt broadband for their cybercafés.

Table 4.19 Less Effort to Maintain Broadband

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	2	2.0
Neutral	38	38.4
Agree	50	50.5
Strongly agree	9	9.1
Total	99	100.0

4.4.2 Ease of Operation of Broadband Application

Respondents were asked whether it was easy to operate broadband applications to enhance the effectiveness of the cybercafé. Table 4.20 shows that 59.6% of the respondents agreed and 3.0% of the respondents strongly agreed. However, 35.4% of the respondents were neutral whereas 2.0% disagreed. Therefore, majority of the respondents agreed that it was easy to operate broadband applications, meaning that broadband internet had the ease-of-use element embedded in it. Consistent with the ease of use of technology construct in the Technology Acceptance Model, ease of operation potentially had a positive influence on respondents' probability to adopt broadband.

Table 4.20 Broadband Application Easy to Operate

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	2	2.0
Neutral	35	35.4
Agree	59	59.6
Strongly agree	3	3.0
Total	99	100.0

4.4.3 Understanding of Broadband Technical Terms

Respondents were asked if they understood all the technical terms related to broadband. Table 4.21 shows that 51.5% of the respondents were neutral. However, 39.4% and 5.1% of the respondents agreed and strongly agreed, respectively. Four percent (4%) of the respondents disagreed. Therefore, majority of the respondents were neutral with regards to their understanding of broadband technical terms. This implies that respondents were perhaps not sure of their knowledge of broadband internet, which would enable them to fully exploit the benefits of broadband connectivity.

Table 4.21 Technical Terms of Broadband Easy to Understand

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	4	4.0
Neutral	51	51.5
Agree	39	39.4
Strongly agree	5	5.1
Total	99	100.0

4.4.4 Ease of Upgrading and downgrading

The study sought to determine whether respondents could upgrade or downgrade broadband subscriptions easily. Tale 4.22 shows that 53.5% of the respondents were neutral; 38.4% of the respondents agreed and 3.0% of the respondents strongly agreed. However, some 5.1% of the respondents disagreed. The results indicate that majority of the respondents were neutral. This suggests that respondents either did not utilize broadband connectivity or lacked the knowledge to upgrade or downgrade. It may be inferred from the findings that respondents' neutrality stemmed from perceived behavioural control as discussed by Vadlamani (2007). In this case, respondents' potential lack of ability or capacity to upgrade and downgrade broadband internet connection accordingly might have an effect on their behavioural intentions towards broadband internet connectivity.

Table 4.22 Ease of Upgrading and Downgrading

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	5	5.1
Neutral	53	53.5
Agree	38	38.4
Strongly agree	3	3.0
Total	99	100.0

4.5 The Influence of ICT Self-Efficacy on the Adoption of Broadband

This section analyzes and presents the findings on the influence of ICT self-efficacy on adoption of broadband internet. The correlation coefficient between self-efficacy dimensions and internet broadband adoption is shown in Table 4.23. The table shows that broadband adoption was significantly correlated to respondents' understanding of internet technical terms (r=.251, p<.05). This implies that the more respondents understood internet technical terms, the more they adopted broadband internet.

However, there was no statistically significant correlation between broadband adoption and respondent's confidence in computer usage (r=.067, p>.05), their ability to troubleshoot computer problems (r=.067, p>.05), internet browsing skills (r=.170, p>.05) and internet troubleshooting skills (r=.186, p>.05). This suggests that these dimensions of self-efficacy did not influence broadband internet adoption. The results imply that ICT self efficacy, while necessary for working in the internet world as implied in the empirical study by Mugeni et al. (2012), was not a sufficient condition for influencing broadband internet adoption.

Table 4.23 Correlation between ICT Self Efficacy and Broadband Adoption

	Spearman's Rho		1
1	Broadband adoption	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	99
2	Confidence in computer usage	Correlation Coefficient	.067
		Sig. (2-tailed)	.510
		N	99
3	Ability to troubleshoot computer problems	Correlation Coefficient	.067
		Sig. (2-tailed)	.511
		N	99
4	Internet browsing skills	Correlation Coefficient	.170
		Sig. (2-tailed)	.095
		N	98
5	Internet troubleshooting skills	Correlation Coefficient	.186
		Sig. (2-tailed)	.066
		N	99
6	Understanding of internet technical terms	Correlation Coefficient	.251(*)
		Sig. (2-tailed)	.012
		N	99

* Correlation is significant at the 0.05 level (2-tailed).

4.5.1 Confidence in Computer Usage

The study sought to establish whether respondents were very confident in computer usage skills. Table 4.24 shows that 26.3% and 59.6% of the respondents agreed and strongly agreed, respectively, whereas 14.1% of the respondents were neutral. Therefore, majority of the respondents expressed confidence in their computer skills. This implies that the respondents had high computer self-efficacy which was fundamental for operating a cybercafé business.

Table 4.24 Respondent Confident in Computer Usage Skills

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	14	14.1
Agree	26	26.3
Strongly agree	59	59.6
Total	99	100.0

4.5.2 Computer Troubleshooting Ability

The question sought to determine whether respondents could troubleshoot computer problems with ease. Table 4.25 shows that 60.6% of the respondents were neutral, 32.3% of the respondents agreed and 5.1% strongly agreed. However, some 2.0% of the respondents disagreed. Thus, majority of the respondents were neutral, implying that they potentially lacked computer trouble shooting ability. This may affect their attitudes towards broadband internet experience as implied in the research findings by Chetty (2012) where study participants did not appear to understand, for instance, that background or non-browser based activities affected their broadband internet experience.

Table 4.25 Respondent's Ability to Troubleshoot C

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	2	2.0
Neutral	60	60.6
Agree	32	32.3
Strongly agree	5	5.1
Total	99	100.0

4.5.3 Internet Surfing Skills

In terms of whether respondents felt that they were very skilled in surfing the internet, 60.6% of the respondents were neutral, 32.3% of the respondents agreed and 5.1% strongly agreed. However, 2.0% of the respondents disagreed. Therefore, majority of the respondents agreed that they were very skilled in internet surfing, meaning that respondents were competent with regards to working with the internet. This by extension, meant that they potentially had a high level of compatibility of skills to work at least reasonably well in broadband internet environment, as there are no changes introduced in the set of skills required.

Table 4.26 Respondents Very Skilled in Surfing the Internet

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	2	2.0
Neutral	60	60.6
Agree	32	32.3
Strongly agree	5	5.1
Total	99	100.0

4.5.4 Respondent's Confidence in Troubleshooti

The opinion of the respondents was sought on whether they could confidently troubleshoot most kinds of internet problems. Table 4.27 shows that 57.6% of the respondents were neutral, 32.3% of the respondents agreed and 3.0% strongly agreed. However, 7.1% of the respondents disagreed. Therefore, the majority of the respondents were neutral with regards to their confidence in trouble-shooting internet problems. This means that respondents were potentially unsure of their capabilities, and this may reflect on the experience that they have with broadband internet characteristics such as always-on connectivity.

Table 4.27 Respondents Confident to Troubleshoot Internet Problems

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	7	7.1
Neutral	57	57.6
Agree	32	32.3
Strongly agree	3	3.0
Total	99	100.0

4.5.6 Respondent's Understanding of Technical

The study sought to determine whether respondents understood technical terms related to internet. Table 4.28 shows that 53.5% of the respondents were neutral, 31.3% agreed and 4.0% strongly agreed. On the other hand, 11.1% of the respondents disagreed. Therefore, majority of the respondents were non-committal as to whether they understood technical terms related to the internet. This potentially suggests that respondents were not confident with their understanding of technical terms in the internet. This may affect their level of knowledge and understanding technical terms related to broadband internet, which by extensions, may have implications on the quality of broadband internet experience they have.

Table 4.26 Respondent Understand Technical Terms Related to Internet

Responses	Distribution	
	Frequency	Percentage
Strongly disagree	0	0.0
Disagree	11	11.1
Neutral	53	53.5
Agree	31	31.3
Strongly agree	4	4.0
Total	99	100.0

4.5.7 Factors Constraining Growth of Cybercafé Business

Respondents were asked to rate the extent to which various factors constrains the growth of their cybercafé business. Table 4.29 summarizes the results. The table shows that 40.4% and 31.3% of the respondents said that computer viruses constrained their business growth to a very small extent and not at all, respectively. However, 26.3% of the respondents said it did to a small extent whereas 1% of the respondents said it was a constraint to a large extent and another 1% said it was to a very large extent. Therefore, majority of the respondents were of the view that computer viruses were a constraint to business growth to a small extent.

In terms of cost, Table 4.29 shows that cost of internet was a constraint to business growth to a very large extent for 56.6% of the respondents and to a large extent for 32.3% of the respondents. However, 8.1% of the respondents felt that cost of internet was a constraint to a small extent, and further, 2.0% said it was a constraint to a very small extent whereas 1.0% said it was not a constraint at all. Therefore, majority of the respondents indicated that cost of broadband internet was a constraint to business growth to a very large extent. This agrees with the findings of a previous study by Choudrie and Dwivedi (2006) which also identified that the main factor for non-adopters were high costs and lack of needs.

The Table 4.29 further shows that 39.4% of the respondents said unreliable electricity supply was a constraint to a very small extent and 32.3% said it was a constraint to a small extent. However, 23.2% of the respondents said it was not a constraint at all

whereas on the other hand, 1.0% of the respondents said it was a constraint to a large extent and another 1.0% said it was a constraint to a very large extent. Therefore, reliability of electricity was a constraint to a small extent according to the majority of the respondents. Similarly, concerning whether competence of cybercafé attendants was a constraint to business growth, Table 4.29 shows that 33.3% of the respondents said that it was a constraint to a small extent, 39.4% said it was a constraint to a very small extent and 27.3% of the respondents said it was not a constraint at all. Therefore, the competence of cybercafé attendants was not a significant constraint to business growth.

Table 4.29 Factors Constraining Growth of Cybercafé Business

	Mean	Very large extent	Large Extent	Small extent	Very small extent	Not at all
Computer viruses	2.0	1.0%	1.0%	26.3%	40.4%	31.3%
Cost of internet	4.41	56.6%	32.3%	8.1%	2.0%	1.0%
Unreliable supply of electricity	2.17	1.0%	1.0%	35.4%	39.4%	23.2%
Competent cybercafé attendants	2.06	0.0%	0.0%	33.3%	39.4%	27.3%

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS.

5.1 Introduction

The general objective of the study was to determine the demand-side factors influencing broadband uptake among small businesses in Kenya. This chapter explains the summary, conclusions and recommendations of the study. The chapter also details the limitations of the study and recommendations for further research.

5.2 Summary of Results

The importance of broadband internet on economic development in the modern world cannot be overemphasized. This is particularly the case for small business enterprises like cybercafés because Kenyans mostly access the internet in cybercafés and also cybercafés are a particularly significant business group that supply the internet in Kenya. However, in spite of their importance in supplying the internet, particularly to lower-income users, they are not actively engaged during the Internet Governance discussions, and the future of the cybercafé market is not a significant agenda raised by internet governance stakeholders in their discussions.

Past reports have revealed many unanswered questions concerning some initiatives in Kenya to increase broadband access through entrepreneurial cybercafés, suggesting that that while studies undertaken on the importance of broadband provide useful insights into the growth effects of broadband, data collection and further systematic research and analysis in this area is needed, particularly target developing countries (emerging economies). With an estimated broadband penetration rate of 2%, Kenya still has significant progress to make with respect to broadband uptake.

It has been noted that stimulating demand and usage by Kenyan citizens both in the public and private sector remains a challenge. However, research on the demand-side factors influencing broadband uptake in Kenya is sparse. In view of the information gap regarding the demand-side factors underpinning broadband penetration in Kenya, this study sought to investigate the demand-side factors as it relates to small businesses in Kenya. The specific objectives were: to determine the influence of perceived usefulness on the adoption of broadband by small businesses in Kenya; to determine the influence of perceived ease of use on the adoption of broadband by small businesses in Kenya; and to

investigate the moderating role of IT self-efficacy on the adoption of broadband by small business owners.

Descriptive research design was used for the study. The target population in this study entailed all the over 50,000 cybercafé businesses operating within Nairobi's Central Business District. A sample size of 100 owners of the cybercafé businesses was selected using systematic sampling technique. A structured questionnaire was used to collect data. Descriptive statistical techniques such as mean and percentage frequencies were established. Inferences were drawn using Spearman's Rank Correlation Coefficient technique, with alpha significant at 0.05 levels. The data was analyzed using the Statistical Package for the Social Sciences.

The results showed that concerning the influence of perceived usefulness on the adoption of broadband by small businesses in Kenya, a statistically significant relationship existed between broadband adoption and perceived value for money (r=.287, p<01), reduced time costs (r=.263, p<.01), affordability (r=.282, p<.01), speed (r=.222, p<.05), streaming (r=.233, p<.01).

Concerning the influence of perceived ease of use on the adoption of broadband by small businesses in Kenya, there was no statistically significant correlation between broadband adoption and maintenance effort (r=.143, p>.05), ease of operation (r=.035, p>.05), ease of understanding technical terms (r=.157, p>.05) and ease of upgrading (r=.068, p>.05).

In terms of the moderating role of IT self-efficacy on the adoption of broadband by small business owners, broadband adoption was significantly correlated to respondents' understanding of internet technical terms (r=.251, p<.05) but not correlated to computer usage (r=.067, p>.05), ability to troubleshoot computer problems (r=.067, p>.05), internet browsing skills (r=.170, p>.05) and internet troubleshooting skills (r=.186, p>.05).

5.3 Conclusion

It can be concluded that perceived usefulness significantly influenced broadband internet adoption among the cybercafés sampled. This manifested in perceived value for money, reduced time costs, affordability, speed of broadband internet and streaming capacity of bandwidth. Generally, broadband was perceived to reduce time costs, provide very fast

downloads and allow for video streaming and downloading of applications. However, always-on connectivity was not experienced. The cybercafés did not use broadband internet as officially defined by the CCK. Affordability was a key concern and cost of internet was a major constraint to their business growth.

With regards to ease of use, broadband internet required less effort to maintain. It was also easy to operate broadband applications. However, there was evidence of a gap in the business owners' understanding of broadband technical terms and their ability to upgrade or downgrade broadband. Nevertheless, ease of use generally did not influence adoption of broadband internet by the cybercafés.

In terms of the moderating role of IT self-efficacy, IT self-efficacy played a direct role in determining broadband adoption with respect to the business owners' understanding of internet technical terms. However, other dimensions of self-efficacy such as ability to troubleshoot computer problems, internet browsing skills and internet troubleshooting skills played no role in determining broadband adoption among cybercafé business owners.

These conclusions necessitate a modification of the conceptual model. This is because the cost of broadband, which has been established in this study as a major constraint that potentially influenced intentions towards adoption of broadband internet, was overlooked as a perceived behavioural control variable. The model could thus be modified by retaining the perceived usefulness variable as the dependent variable and introducing affordability as an intervening variable. The rest of the dependent and intervening variables should be dropped from the conceptual model.

5.4 Recommendations for Improvement

In order to enhance broadband penetration, last mile service providers should make available broadband connectivity at a price that majority of the customers targeted can afford. Given the significant role played by cybercafés in providing access to broadband internet connectivity to the lower income segment of the population, the government, through the Communications Commission of Kenya *(now Communications Authority of Kenya*) could play a part in the bridging of the broadband 'digital divide' by offering broadband internet suppliers with incentives such as tax rebates or tax relief to companies

to come up with special internet packages specifically targeting small businesses e.g. cybercafés. Such incentives would subsequently stimulate economic growth in this sector.

5.5 Recommendations for Further Research

This study has clearly isolated broadband internet cost and the question of affordability as the key constraint to faster broadband internet penetration in Kenya. Therefore, a study could be conducted on how broadband internet connectivity could be made affordable to the small and micro enterprise business sector while being sustainable. Secondly, this research was limited in scope to cybercafés operating in the Central Business District of Nairobi. In order to increase the reliability of statistical estimates, another research that include cybercafés outside the CBD as well as extending to other towns in Kenya could be undertaken to validate or refute the research results. Lastly, the focus of the study on cybercafés meant that the experiences of other small and micro enterprises were left out. Therefore, another study that investigates broadband adoption patterns among Small and Middle Enterprises (SMEs) that do not engage in the cybercafé business could be conducted.

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APPENDIX: QUESTIONNAIRE`

SECTION A: GENERAL INFORMATION

1. How long have you operated the cybercafé?

   Less than 1 year ❑
   1 to 3 years ❑
   2 to 5 years ❑
   More than 5 years ❑

2. How many people work in your cybercafé apart from you?

   1 employee ❑
   2 employees ❑
   3 employees ❑
   More than 3 employees ❑

3. How many functional computer workstations do you have?

   Less than 5 ❑
   5 to 10 ❑
   11 to 20 ❑
   21 to 50 ❑
   More than 50 ❑

4. By your estimation, what is the average occupancy rate in any one hour?

   All the computers are always occupied ❑
   More than half of the computers are occupied ❑
   Just over a third of the computers are occupied ❑
   Less than a quarter of the computers are occupied ❑

5. Generally, how would you describe the growth of your cybercafé business?

   Growing ❑ Stagnated ❑ Declining ❑

6. What internet bandwidth downstream do you use for your cyber-cafe?

   Less than 256kbs ❑ 1 to 5 Mbps ❑
   256 to 512kbs ❑ More than 5 Mbps ❑

SECTION B: PERCEIVED USEFULNESS

In the following section, please tick (✓) inside the box which closely represents your opinion on each statement?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
8. Broadband subscription is a worthwhile investment					
9. Broadband internet significantly reduces time costs					
10. The charges for broadband internet are affordable					
11. Broadband connection provides very fast downloads which is good for my business					
12. It is exciting to stream video/download applications using broadband thanks to its high speed					
13. With broadband, there are no downtimes					
14. Broadband internet enables users to multi-task hence attracting more customers to the cyber					
15. I find value for money in using Broadband for internet compared to other internet options					

SECTION C: PERCEIVED EASE OF USE

In the following section, please tick (✓) inside the box which closely represents your opinion on each statement?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
16. Broadband internet takes less effort to maintain					
17. It is easy to operate broadband applications to enhance the effectiveness of the cybercafé					
18. I understand nearly all the technical terms related to broadband					
19. I can upgrade or downgrade broadband subscription easily					

SECTION C: ICT SELF-EFFICACY

In the following section, please tick (✓) inside the box which closely represents your opinion on each statement?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
16. I am very confident in computer usage skills					
17. I can troubleshoot computer problems with ease					
18. I am very skilled in surfing the internet					
19. I can confidently trouble shoot most kinds of internet problems					
20. I understand technical terms related to internet					

Please rate the extent to which the following factors constrain the growth of your cybercafé business

	Very large extent	Large Extent	Small extent	Very small extent	Not at all
21. Computer viruses					
22. Cost of internet					
23. Unreliable supply of electricity					
24. Competent cybercafé attendant					
25. Other (Please specify):					

26. Generally, do you think internet speeds have improved since the laying down of fiber optic cables in Kenya? Yes ❑ No ❑

Please explain _____

THANK YOU FOR YOUR TIME AND COOPERATION