Project Title: "A MODEL FOR TELECOMMUTING IN KENYA"

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Date: July 2010
DECLARATION

This project, as presented in this report, is my original work and has not been published or presented for any other University award.

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This project has been submitted in partial fulfillment of requirements for the Master of Science in Information Systems of the University of Nairobi with my approval as the University supervisor.

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DEDICATION

I dedicate this project to my family
ACKNOWLEDGEMENTS

This survey would not have been possible without the generous support of the following persons and institutions. My supervisor, Dr. Elijah I. Omwenga for his relentless efforts and valuable guidance during the study. The University of Nairobi through the School of Computing and Informatics for providing the platform for my research work.

My family and friends, for their moral support and encouragement with a special mention of my wife for her inspiration. My employers, for giving me an enabling environment to carry on with studies at the University. The respondents for their time, and the valuable information they provided during the interviews.

Above all, the Almighty God, for the gift of life and grace throughout the study period.
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## LIST OF TERMINOLOGY

<table>
<thead>
<tr>
<th>WORD</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Blackberry</td>
<td>A wireless handheld device which supports push e-mail, mobile telephone, text messaging, internet faxing, web browsing and other wireless information services. Developed by the Canadian company Research In Motion (RIM), it delivers information over the wireless data networks of mobile phone service companies.</td>
</tr>
<tr>
<td>Confidence interval</td>
<td>The confidence interval is the plus-or-minus figure usually reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 4 and 47% percent of your sample picks an answer you can be &quot;sure&quot; that if you had asked the question of the entire relevant population between 43% (47-4) and 51% (47+4) would have picked that answer.</td>
</tr>
<tr>
<td>Confidence level</td>
<td>The confidence level tells you how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means you can be 95% certain; the 99% confidence level means you can be 99% certain. Most researchers use the 95% confidence level.</td>
</tr>
<tr>
<td>Extranet</td>
<td>A private network that uses Internet protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with suppliers, vendors, partners, customers or other businesses. It can be viewed as part of a company's intranet (see definition) that is extended to users outside the company.</td>
</tr>
<tr>
<td>WORD</td>
<td>DESCRIPTION</td>
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<td>--------------------</td>
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<tr>
<td>Information society</td>
<td>A society in which the creation, distribution, diffusion, use, integration and manipulation of information is a significant economic, political, and cultural activity. Specific to this kind of society is the central position information technology has for production, economy, and society at large. Information society is seen as the successor to industrial society.</td>
</tr>
<tr>
<td>Internet</td>
<td>A worldwide system of computer networks – a network of networks in which users at any one computer are able to get information from any other computer on the same or other network in the system.</td>
</tr>
<tr>
<td>Intranet</td>
<td>A private computer network that uses Internet technologies to securely share any part of an organization's information or operational systems with its employees.</td>
</tr>
<tr>
<td>Networked Readiness</td>
<td>The World Economic Forum's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by information and communications technology. It is published annually. The NRI seeks to better comprehend the impact of ICT on the competitiveness of nations.</td>
</tr>
<tr>
<td>Telecommunication</td>
<td>Telecommunication is the common description for technology enabling two-way communication between parties located at distances from each other. Telecommunication also comprises one-way communication technology such as television and radio broadcasting.</td>
</tr>
<tr>
<td>Telecommuting</td>
<td>An alternative work arrangement for employees to conduct all or some of their work away from the primary workplace.</td>
</tr>
<tr>
<td>Tele-working</td>
<td>Though used interchangeably with telecommuting, Teleworking is a broader term, referring to substituting telecommunications for any form of work-related travel, thereby eliminating the distance restrictions of telecommuting. All telecommuters are teleworkers but not all teleworkers are telecommuters.</td>
</tr>
</tbody>
</table>
VoIP

A family of transmission technologies for delivery of voice communications over the Internet or other packet-switched networks.
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>ABBR</th>
<th>MEANING</th>
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<tbody>
<tr>
<td>3G</td>
<td>Third-Generation</td>
</tr>
<tr>
<td>BPO</td>
<td>Business Process Outsourcing</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CDMA</td>
<td>Code Division Multiplexing</td>
</tr>
<tr>
<td>ERM</td>
<td>Environmental Resources Management</td>
</tr>
<tr>
<td>GDC</td>
<td>Government Data Centre</td>
</tr>
<tr>
<td>GPRS</td>
<td>General Packet Radio Service</td>
</tr>
<tr>
<td>GSM</td>
<td>Global Standard for Mobile Communication</td>
</tr>
<tr>
<td>HSPDA</td>
<td>High Speed Packet Data Access</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>IDF</td>
<td>Import Declaration Form</td>
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<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
</tr>
<tr>
<td>ITAC</td>
<td>International Telework Association &amp; Council</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>KTCIP</td>
<td>Kenya Transparency Communication Infrastructure Programme</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>MDS</td>
<td>Mobile Data System.</td>
</tr>
<tr>
<td>NDC</td>
<td>Neutral Data Centre</td>
</tr>
<tr>
<td>NOFBI</td>
<td>National Optical Fiber Backbone Infrastructure</td>
</tr>
<tr>
<td>NRI</td>
<td>Networked Readiness Index</td>
</tr>
<tr>
<td>PBX</td>
<td>Private Branch Exchange</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>PSTN</td>
<td>Public Switched Telephone Network</td>
</tr>
<tr>
<td>RCIP</td>
<td>Regional Communications Infrastructure Program</td>
</tr>
<tr>
<td>ROI</td>
<td>Return on Investment</td>
</tr>
<tr>
<td>TEAMS</td>
<td>The East Africa Marine System</td>
</tr>
<tr>
<td>VoIP</td>
<td>Voice over Internet Protocol</td>
</tr>
<tr>
<td>VPN</td>
<td>Virtual Private Network</td>
</tr>
<tr>
<td>WAN</td>
<td>Wide Area Network</td>
</tr>
<tr>
<td>WiMAX</td>
<td>Worldwide Interoperability Microwave Access</td>
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ABSTRACT

Given the emerging technologies and the need for employers to be more flexible about where and how people work, telecommuting would seem one logical and promising solution. However, telecommuting does not seem to thrive in Kenya. This study explores the feasibility of telecommuting in Kenya, examining the factors contributing to its low prevalence and the possible benefits that can be derived from its implementation. The study further develops a model on the process of implementing and running a successful telecommuting program in a typical organization.

The study used a cross-sectional survey design in which standardized information was collected from a randomly selected sample of people through written/self-administered questionnaires and in-depth data was collected through personal interviews with carefully selected sample of people and document reviews.

This study established that there are very few elaborate telecommuting programs being used within organizations in Kenya. Even though some organizations, especially multinationals, have the capacity to implement telecommuting, many only go as far as offering flexible work programs. The study examined the factors impeding uptake of telecommuting and the plethora of ongoing initiatives that are making telecommuting a possibility today. The study puts together a telecommuting model that outlines the set of strategies, methods, technologies and organizational changes necessary for successful implementation of telecommuting.

Collection of statistical data on telecommuting and evaluation of the results requires several years in order to study the before- and after-effects of telecommuting on various aspects of a worker's life. Due to resource constraints, the proposed telecommuting model has not been tested in a real life situation. This is an opportunity for further research that could provide empirical results of a real telecommuting program.

This study provides a well of knowledge on Telecommuting that will go a long way in helping Kenya to take advantage of the enabling capacity of information and communications technologies and applications in her drive for comprehensive development.
CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Telecommuting has been in existence since the early 1970s. The increasing availability of sophisticated high speed telecommunications links, portable computers, and ever-present pocket communication devices almost guarantees that many employees today can work almost anywhere at least some of the time. It is well known that telecommuting or tele-working as it is sometimes called, brings with it many benefits such as increased productivity, better work life balance to employees, motivation, reduced transportation costs, reduced business travel time losses related to traffic congestion, reduced air pollution and lower operation costs. More so in this day and age when the price of fuel is rising every other day and demand for housing in urban areas is rising exponentially. Other indirect benefits involve reduced costs associated with sick leaves, distractions in office and underperformance due to family stresses while at work. Telecommuting is also a powerful way of enabling those with disabilities to participate fully in the country’s workforce and ensuring business continuity in the event of catastrophes or upheavals as was the case during the post election violence in Kenya.

The developed countries have done extensive research in this area and have come up with guidelines and policies on telecommuting and many of them are reaping the benefits today. Furthermore, most employees these days are information workers who need not waste a lot of time commuting to and from office, time that would otherwise be used to do other tasks. Sales executives and marketers are often out of their offices mostly meeting with clients and only go back to the office to prepare proposals. Engineers are in most cases either on site installing new systems, troubleshooting and fixing a problem or simply busy-waiting in the office. Clearly, this does not require the staff to be at a particular office location.

Inasmuch as telecommuting has become the trend in the developed countries, it is not clear to what extent telecommuting is being used in Kenya. Many of the managers are uncertain about the benefits of telecommuting and its effects on their organization and employees while others are not able to visualize the practicability of such a program especially the technical issues involved. As a developing country, one would be quick to point out that Information and Communication Technologies (ICT1), or the lack of it, is the main barrier to the adoption of telecommuting. This may be true given that telecommuting is an ICT-intensive program and may partially explain why many organizations do not implement telecommuting as a deliberate strategic approach to working styles.

The Government of Kenya, while implementing the e-government program, has not envisaged telecommuting as an aspect of e-governance. It is commendable though that some of the government agencies have embarked on e-services such as the Kenya Revenue Authority (KRA)

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1 ICT may be defined as the developing technologies of telecommunications, computing and microelectronics and their convergence (Omwenga, 2003)
online service that allows clearing agents flexibility on their office location as they can now lodge Import Declaration Forms (IDF) remotely and pay electronically.

This study aims to establish the prevalence of telecommuting in Kenya with a view to identify the main issues that impede the uptake of telecommuting in Kenya. The study will further develop a model of telecommuting implementation in Kenya citing the various phases of implementation as well as propose some solutions to the various problems impeding the uptake of telecommuting in Kenya.

Though largely beneficial, telecommuting is not automatically a successful concept in all situations of work. A criterion needs to be established, upon which organizations can assess their readiness to undertake telecommuting both from a company-wide perspective and employee perspective. This study will therefore seek to establish the factors to be considered in determining such readiness and guarantee successful adoption and use of telecommuting.

1.2 PROBLEM DEFINITION

Despite the increasing importance of telecommuting, owing to its numerous benefits, there seems to be a slow rate of penetration in the developing countries in general and Kenya in particular. In many developed countries, telecommuting is not only viewed as a flexible work option for individual employee needs but has become a more popular way of working especially with advanced technologies. The history of telecommuting has demonstrated credible productivity benefits yet it has not been embraced in many organizations in Kenya. Instead, employees spend many hours in traffic jam before getting to their respective work places or their residences. Worse still, traffic congestion within the Central Business District (CBD) has become the norm and maneuvering through the traffic to get to appointments is a daunting task.

It is therefore an opportune time to examine telecommuting in Kenya and based on the findings, possibly come up with recommendations for the government and the private sector that would promote the adoption and use of telecommuting. As telecommuting relies heavily on ICT, the cost of the ICTs and its capacity and availability is perpetuated as the major challenge in a developing country like Kenya. Is this really the case? The lack of an elaborate guide on how an organization can go about implementing a telecommuting program directly impacts the uptake of telecommuting.

1.2.1 Purpose Statement

The purpose of the study is to establish the extent and scope to which telecommuting has been adopted and used in Kenya. The study will come up with a model that will highlight the set of methods, technologies, and organizational changes necessary for successful use of Telecommuting as an acceptable mode of working. By so doing, it is hoped that many organizations both in the government and the private sector may embark on telecommuting programs thereby improve the Networked Readiness Index of Kenya.
1.2.2 Research Questions

1. To what extent are organizations in Kenya utilizing telecommuting as a deliberate strategy to improved productivity?
2. Is telecommuting a viable approach to the Kenyan working force from both the Employer and Employee perspective?
3. What benefits do organizations stand to gain by adopting telecommuting?
4. What are the set of ICT strategies, methods, technologies, and organizational changes necessary for successful implementation of Telecommuting?

1.2.3 Research Objectives

1. To explore the feasibility of using telecommuting to compliment the traditional primary workstation approach in organizations in Kenya.
2. To come up with a model for implementing and operating telecommuting in organizations in a resource-constrained environment as is the case of Kenya.
3. To specifically address ICT related barriers to implementation of telecommuting.

1.2.4 Expected Results

1. An indication of the prevalence of telecommuting in Kenya with Nairobi and its environs as the target area.
2. Recommendations of implementation and operationalization of telecommuting programs in the Kenyan setting.
3. A methodology of implementing a Telecommuting program.

1.2.5 Basic Assumptions

One major assumption made in this study regards the definition given to Telecommuting. Many telecommuting studies have limited the scope to only those people who work from home. This study however, assumes that the telecommuting community includes all those people who from time to time, make use of telecommunication links to replace physical travel to their central place of work while carrying out work-related duties. This notwithstanding, occasionally checking voice mail from home or on the road, or working at home less than one day per week does not qualify as Telecommuting under this definition.

Most telecommuting projects demand a lot of coordination between the many stakeholders. Collection of statistical data and evaluation of the results requires several years in order to study the before- and after-effects of telecommuting on various aspects of a worker’s life. This would however not be possible within the allocated time and available resources for the purposes of this course. Consequently, the survey has been scaled down considerably and as such may not capture some of the long-term effects of telecommuting.
1.2.6 Project Justification

Telecommuting offers a number of benefits, some of which include complementing the transportation systems, conserving resources, improving the quality of life and increasing the workforce. Recent developments in the ICT sector provide the much needed recipe for telecommuting. ICT is needed to provide tele-workers with an effective work environment in the home, and to maintain connectivity with the office. This notwithstanding, many organizations in Kenya do not seem to have telecommuting programs within their work options, hence the need to examine the concept of telecommuting in Kenya. This study will inspire initiatives to increase the use of telework by organizations in both the private and public sectors in Kenya. By availing information that demystifies telecommuting, it is likely that managers may decide to adopt telecommuting in their organizations.

The government, through the relevant ministries, may use this study as a basis to draft policies that facilitate establishment of teleworking as an acceptable work option. This will also aid in budgetary planning for both the public and private sectors in Kenya. It is also anticipated that in implementing the e-government project, the government may explore ways of incorporating telecommuting as a key driver towards e-governance. It is a known fact that traffic jams and the increasing cost of fuel the world over is driving up the cost of travel. These are some of the problems that telecommuting seems to solve and hence necessitate this study. Furthermore, the world today is faced with a serious problem of climate change that has been caused by global warming. Telecommuting can offset more CO2 than it emits, making it one of the key ways in which we can fight against climate change (Offsetting Emissions with Technology, 2009).

Inasmuch as telecommuting is a good thing, there are many challenges to be overcome. One of these is the availability of sufficient bandwidth to support such needs. The cost of sustaining such a service is yet another challenge. The study, through market research, sets out to highlight such challenges and possibly come up with feasible solutions that will simplify the grey areas around the issue technological readiness.
CHAPTER TWO: LITERATURE REVIEW AND THEORY

2.1 DEFINITION OF TELECOMMUTING

Telecommuting, otherwise referred to as teleworking, may be defined as an alternative work arrangement for employees to conduct all or some of their work away from the primary workplace. The daily physical commute to a central place of work is replaced, in part or whole, by telecommunication links.

The term 'telecommuting' was coined by Jack Nilles and was first used in the United States while the term Telework is often used in Europe. In most literature, telecommuting and telework are used interchangeably. The "tele" part of the term refers to the communications technology that makes this work option possible. In this program, employees get their assignments and turn in finished work using the various electronic connections they have to the primary workplace: telephone, fax machine, and a personal computer that is linked to office systems, to name but a few. A typical phrase used to justify this arrangement is that 'work is something you do, not something you travel to' ("Telecommuting," 2006) or 'why move people, when you can move information'.

According to Limburg (2002), the definition of telework should reflect the practice of telework in organizations, not simply something employees want to do, but what the organization does. As telecommuters need not necessarily work from the home, the distributed work concept broadens telecommuting to include the effective performance of organizational tasks in places that extend beyond the confines of traditional offices. The key is in having flexibility in working location and hours, be it at home, tele-centres, a customer's site, an office closer to the employee's residence, or any other acceptable location - through the application of Information and Communication Technology (ICT). ICT enables the movement of bits (information) instead of movement of atoms (materials), making society smaller and using fewer material resources (Offsetting Emissions with Technology, 2009). IT workers, for example, generally support their companies by keeping computers and databases running and building websites and applications. Some can do their jobs without talking to co-workers more than once a day. The more interactive IT jobs typically involve early morning and late-night conference calls with colleagues around the world (Nicole, 2006).

2.2 REVIEW OF PREVIOUS RESEARCH AND OPINIONS

Telecommuting has been around for close to four decades and a number of studies have since been done around it especially in North America. Similar studies are ongoing in Great Britain and other parts of Europe. Consequently the literature on telecommuting has grown rapidly in recent years including a variety of frameworks that have been formulated for some developed countries. There is however limited information in public domain about telecommuting in Kenya and/or other developing countries.

The results of American and European studies may not be representative of the situation in Africa, or Kenya for that matter. This review will look at the telecommuting aspects in the West then map them to the situation in the developing countries with special attention to the resource-constrained
environment in which many of the organizations operate. In this regard we look at the aspect of technology under the Telework America Survey.

Extensive research has been carried out in developed countries and out of this research there is today a number of telecommuting models, frameworks and Guides. This review will also consider three of these models namely the Queensland Framework on Telecommuting, US Federal Government: Telework guide and the Smart Valley® Telecommuting Guide – Cisco.

2.2.1 The Telework America Survey

According to the Telework America Survey 2002 by Pratt (2003), the availability of broadband infrastructure, the usability of virtual communication tools and the risk of data security problems may influence management decision to adopt telework. The key finding from the survey were that - Teleworking employees with high-speed “always on” broadband service work more flexibly and productively at home and other locations than workers who use dialup. They telework more frequently, shifting their work location from their employer’s site to home. In addition, the quality of ICT and facilities for telework plays an important role in the success of telework in a given company.

The success of telecommuting therefore relies heavily on the technological abilities to substitute physical travel with virtual interaction. A model telecommuting set-up involves the use of unified messaging services for voice, fax, Electronic mail (e-mail) and remote networking applications. Virtual teams would use groupware and browsers to collaborate with team members, and rely on use of telephones and video conferencing to interact with team members.

This implies that when checking the readiness of an organization to implement telecommuting in Kenya one should go beyond the mere issue if checking availability of the technology and delve into the capacity of this technology.

2.2.2 Queensland Framework on Telecommuting

In the developed countries, governments have been key players in sponsoring surveys and research on telecommuting. The Queensland Government (Australia) started a Flexible Work Program (FWP) project in 1997. The project aimed to develop a framework that balanced the interests of the organization, client, employee and the ‘government as employer’ (Department of Industrial Relations, 2002).

The Framework is divided into four main aspects starting with the Workforce Management Strategy that addresses issues such as enabling client service and balancing work and other life commitments and workforce planning. On this it concludes that by fostering work environments that support flexibility and accessibility, telecommuting linked in to the strategic direction of organizations through effective leadership, people and diversity management. Other aspects that form this framework include Telecommuting policy, application procedures and templates, criteria for determining who telecommutes and consideration for a telecommuting agreement.
2.2.3 US Federal Government: Telework guide

In the United States, the Office of Personnel Management (OPM) is actively involved in facilitating telecommuting for the Federal Government. Among the key drivers is the need for Federal officers to give services even during natural calamities or extraneous weather conditions that would otherwise prevent the officer from getting to their primary work stations. The OPM goes as far as conducting annual telework surveys to identify the number of employees "offered the opportunity to telework". Managers and supervisors who aggressively encourage the use of telework for the right employees and the right situations will contribute to the overall performance of the Federal Government (US Office of Personnel Management, 2003).

America may as well be referred to as the cradle of telecommuting, yet studies there reveal otherwise. Although the majority of Fortune 1,000 firms offer telecommuting, more than half say that only between 1 percent and 5 percent of employees participate in such programs (Wells, 2001). However, due to the digital divide, it may be observed that the employees in the developing countries are actually not offered this opportunity to telecommute.

2.2.4 Smart Valley® Telecommuting Guide – Cisco

This document covers nearly all the areas of telecommuting based on three surveys conducted by smart Valley on telecommuting trends in Silicon Valley. In this guide, the various types of telecommuting are discussed, the criteria for determining who telecommutes is address as well as justifications for telecommuting through cost benefits analysis. For the cost benefit analysis, the Cisco model proposes the use of the Strategy Decisions Group’s (SDG) six-step strategy development process (Figure 1 below).
SDG’s approach is typically executed by cross-functional project teams who work together on a daily or weekly basis. A senior executive team is involved at key points in the process to set direction and to provide feedback and guidance to the project team.

The team evaluated the various telecommuting strategies by collecting information with regard to the estimated costs associated with space/facilities, Telecommuting program Initial costs, Human Resource (e.g., performance/appraisal redesign, if applicable), Changes in insurance (e.g., Workers' Comp.), Legal/contract development/reviews, Training for managers and telecommuters, Technology (e.g. Computers, Software, Modems, Networks, Installation) and Ongoing program maintenance (e.g. information systems, HR systems and Facilities/administration).

The guides goes further to elaborate telecommuting as an internal project that need to be managed complete with clear goals and a project office – The telecommuting Project Team. Also elaborated in the guide are the actual activities and samples of documents such as the telecommuting policy that could be adopted by an organization wishing to implement a telecommuting program.

The Cisco model also provides guidance on management of telecommuters in terms of how to select telecommuters and eventually manage them remotely as opposed to on site. This section also focuses on the institutional cultures that have to be overcome both from a management perspective and from an employee’s individual character point of view.

Finally, the Cisco telecommuting guide dimensions a hypothetical telecommuting program by exploring a virtual office organization in which fundamental aspects of Internet Standards, Internet Access, Platform Independence, Management, Development Environment, Messaging, Security and Groupware Functionality. Of importance is the fact that for telecommuting to be operational, all applications and data on corporate networks (Intranets) should be made accessible via the Internet/intranets (assuming appropriate access privileges and security can be established). In terms of the Technology, the Cisco model posits that Today's technology provides a wide range of solutions that can help you be an effective telecommuter. The key is to choose the right solution for the organization. Instead, the model simply outlines the process that should be followed in doing so.

2.2.5 Other Studies and Opinions

We are in the advent of an ‘information society’ where most careers are service oriented rather than product oriented with machines/robots having replaced most of the functions in industrial plants. It is, according to Omwenga (2003), almost rhetorical to speak of the ‘information society’, the ‘information age’, or the ‘information revolution’ when referring to the impact of information and communication technologies (ICTs) on economic and socio-cultural development during the later half of the 20th century. More and more, a sizeable number of employees require less and less face-to-face interaction with co-workers. Many employees are therefore often confined in a common work place primarily due to the need to access communication and computing facilities that are
located at the offices. This is besides the need for management to supervise the employees and in some cases due to the less popular corporate culture. Consequently, it is viewed that if the communication channels were put in place within reasonable proximity to the employees, then work would go on normally while both the employee and employer tap into the benefits of telecommuting. The good news according to Wells (2001) is that the world is becoming more networked with the passing of each day. Not only are the number of interconnections amongst individuals, businesses, and governments increasing, but there is also increased recognition of connectivity as a key component of public infrastructure in general. Many developing countries are using WiMAX deployments to leapfrog past copper wire. Today, the undersea fibre cables are linking Africa to the rest of the world a move that will see the cost of communication drop drastically and spur the move towards telecommuting.

The available literature revolves around the positive effects of telecommuting. Many of the research studies concluded that telecommuting increases productivity, job satisfaction, and other quality measures. Other research results showed that telework improves the quality of work/life and job performance by reducing office overcrowding and providing a distraction-free environment for reading, thinking, and writing. According to the International Telework Association and Council (ITAC) telework results in increased productivity and worker retention. ITAC conducted a study and found that telework reduced turnover by an average of 20 percent, boosted productivity by up to 22 percent, and trimmed absenteeism by 60 percent. AT&T, which has more than 25% of its workforce teleworking on a regular basis, has found fewer people taking sick leave, better worker retention and higher productivity since making teleworking an option to employees. Additionally, telecommuting allowed companies to adhere more closely to the Clean Air Act, the Family and Medical Leave Act, and the Americans with Disabilities Act. Other studies produced similar findings.

Other research projects have been carried out with a transport perspective. Since the inception of information and communication technologies (ICT), the space-time paths have been altered greatly that may affect the levels of human interaction, land-use decisions and travel behaviour... when face-to-face interaction is being used in the initial stages, relationship can be followed-up later by emails or telephones (i.e. trip substitution). For instance, work activities (e.g. project planning activities) previously requiring business travel to customers can now be undertaken at the office through online collaboration software and the use of electronic communication tools (e.g. video conferencing, instant messaging, emails etc) to support interaction. (Lim et al., 2003).

The challenge in this study was on the possibility of electronic communication being good enough to substitute face-to-face interaction. Nevertheless, ongoing technological developments have improved “virtual interaction” tools greatly where people can look and talk to each other in real-time using ICT. With portable computers, high-speed telecommunications links, and ever-present pocket communications devices, many employees today can work almost anywhere at least some of the time. These work arrangements are likely to become more popular with the current trends towards greater customization of services and virtual organizing. Distributed work offers great
potential for firms to reduce costs, enhance competitive advantage and agility, access a greater variety of scarce talents, and improve employee flexibility, effectiveness and productivity. More employees can thus spend more time in the field with various customers and delivering services on the spot that previously would have needed office-based staff and visits by customers to the company’s office. In this regard, it can be said that there are three types of telework: home-based or full-time telework, centre-based or part-time telework and mobile-based telework.

In their review of the literature on telecommuting and its implications for vehicle travel and emissions, Walls and Safirova (2004) point out that many surveys do not address telecenters at all, thereby leaving out workers who telecommute in that way. Secondly, some workers may telecommute part of a day and work in the office part of the day. This explains the discrepancies in the findings about the extent of telecommuting in the US. For instance while a national survey done by the Census Bureau finds that approximately 1% of California workers in occupations that are conducive to telecommuting report that they “usually” work at home, another annual national survey by a private firm, Link Resources, finds that between 1.88% and 3.34% of U.S. workers telecommute. Two (2) other California surveys indicate about 9.8% (Walls & Safirova, 2004). The justification for this was that the later surveys allowed for the possibility of telecommuting only occasionally—as opposed to “usually” in the Census survey. Another explanation is that the amount of reported teleworking varies across studies because the sample of workers is often different.

Research by Lim et al. (2003) on the effects of telework on organization and business travel state that there are three dominant factors influencing the decision makers to adopt telework in an organization: management goals, individual needs and quality of ICT and facilities. In their explanatory study, they posit that the quality of ICT and Telework place facilities plays an important role as to whether telework would be adopted in a company or not. Also the availability of broadband infrastructure, the usability of virtual communication tools and the risk of data security problems may influence management decision to adopt telework (Lim et al, 2003).

Previous surveys also assert that managers and supervisors are key players in the tele-work process. They set the parameters of the tele-work arrangement and define tele-work for their organizations. Studies show that clear guidance and direction increase the chances of success for tele-work programs.

2.3 WHY THE STUDY NOW

There have been significant changes in Kenya in the recent past that provide sufficient motivation to research on Telecommuting. Globalization and the technological advancements being experienced in Kenya today open new possibilities for telecommuting. The increase in broadband providers empowers telecommuting by raising the functionality of a home office to the level of the corporate office.

A Telework America Research Report of the International Telework Association & Council (ITAC), showed that Telecommuting has become of age with Broadband. As a result, Employees
with broadband connection telework more frequently than those with dial-up and exhibit greater ‘connectedness’ with others and greater productivity enhancements than did their dialup counterparts (Pratt, 2003). It is no secret that today Kenya is at the verge of a Broadband windfall and each and every ICT service provider is actively enhancing this as a competitive advantage including the Mobile operators who have introduced data bundles featuring High Speed Packet Data Access (HSPDA) typically referred to as 3G.

Previous surveys have also not addressed the emerging technologies such as VoIP and Group Decision Support Systems as enablers of Telecommuting. This study will explore and provide an insight on the technical capacities available in Kenya that would facilitate cost effective telecommuting by incorporating the emerging technologies.

The study is guided by the premise that successful implementation of large-scale teleworking requires combinations of organizational flexibility with good ICT infrastructure and well-developed human resource management (HRM) policies (Limburg, 2002). Barriers due to information technology are impacting the implementation of home-based telework programs in Kenya. Development of Telecommuting frameworks that link people management with strategic direction to enable improved business outcomes is a worldwide trend in both the public and private sectors. This makes this study a necessary undertaking now.

Finally, we are aware of the plethora of ICT development initiatives that are on-going in Africa at country, regional or even continental level (Okpaku, 2002). There are similar ICT for development initiatives that look at how to take advantage of the enabling capacity. It is therefore appropriate that Telecommuting becomes one of such initiatives and hence the relevance of this study.
CHAPTER THREE: METHODS

3.1 RESEARCH METHODOLOGY

This project is in the form of a survey that involves collecting standardized information from a carefully selected sample of people. The data will generally be collected through personal interviews, telephone, written/self-administered questionnaires, and written/researcher-administered questionnaires.

Most telecommuting projects demand a great deal of coordination between the many stakeholders. Collection of statistical data and evaluation of the results requires several years in order to study the before- and after-effects of telecommuting on various aspects of a worker’s life. This would however not have been possible within the time allocated and the resources available for the purposes of this course. Consequently, the survey was scaled down accordingly to focus on the implementation methodology.

This study used a cross-sectional survey design to assess the penetration of telecommuting in organizations. Cross-sectional survey has the advantage that the findings from the sample can be applied to the wider target group or the population as a whole. Again quantitative estimates can be made for the size and distribution of impacts. Through the cross-sectional survey design, it is possible to assess the capacity of ICTs in organizations and in the market with a view to establish the feasibility of implementing telecommuting programs in Kenya. The key steps that were followed in the survey are as follows:

i.) Establish the goals of the survey, as in what is to be learnt
ii.) Determine the sample – whom to interview
iii.) Choose the interviewing methodology
iv.) Create the questionnaire
v.) Pre-test the questionnaire
vi.) Conduct interviews and enter data
vii.) Analyze the data and produce reports

The survey was expected to achieve the following goals;

- Provide baseline data against which the performance of telecommuting can be compared to traditional work approaches.
- Offer a comparison between telecommuters and non-telecommuters.
- Provide the actual conditions under which typical Kenyan organizations operate.
- The survey was also to be used as a key input to a formal evaluation of impacts of telecommuting.

3.1.1 Expected challenges in carrying out the survey

Inasmuch as survey is the most ideal method to carry out the research, it was expected that there would be some foreseeable challenges or disadvantages. These included:-

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- Results not being available for a long period of time.
- The processing and analysis of data could be difficult.
- Large surveys, such as household surveys are often expensive and time-consuming
- Possible biases because researchers may ask leading questions; the sample population may be biased in a particular way; questions may not be clear or the respondents may be influenced by the researcher.

3.2 SOURCES OF DATA

Information for this study may be obtained from several sources, many of which are listed below:

1. ICT markets: To avail information on available ICT infrastructure and associated costs as regards implementation and operation of telecommuting programs including training of employees.
2. Surveys and proposals for national projects such as the e-government to aid in establishing the feasibility of telecommuting.
3. Statistics obtained for telecommuting related faculties e.g. the traffic density occasioned by trips to work places and possibly the associated costs.
4. Document reviews of previous studies regarding the subject matter.

Both random sampling and selective sampling will be used to provide the population of research.

3.2.1 The Sample

The survey targeted working class population from a cross-section of organizations in and around Nairobi, Kenya. This sample gave indicative information regarding the various aspects of telecommuting. The survey used stratified sampling approach in which participants were chosen so that the sample had characteristics of the target. In this regard, the qualified sample was sub-divided into five groups according to their job classifications as follows:

1. Managers such as Human resource managers, supervisors and company executives responsible for monitoring and coordinating the employees.
2. Employees of various organizations irrespective of job function.
3. IT Managers of various companies.
4. Service providers for computing, voice and data services.
5. Policy makers especially from the government and other agencies.

To enhance the research, it was intended that organizations that have or are in the process of implementing telecommuting in Kenya would be identified and people in such organizations included in the sample.

3.2.2 Sample Size

Statistically, a small representative sample will reflect the group from which it is drawn. The larger the sample, the more precisely it reflects the target group. The sample size used in this survey was determined based upon the time that was available, the budget and the necessary degree of
precision required. A Sample Size Calculator\(^2\) provided by Creative Research Systems (2008), was used to calculate the sample size for this survey with the settings of 99% confidence level, and a confidence interval of 20.

![Determine Sample Size](https://example.com/sample_size_calculator.png)

**Figure 2:** Screen shot of Sample Calculator from Creative Research Systems

The formula used to calculate the sample size in this calculator is:

\[
ss = \frac{Z^2 \cdot (p \cdot (1-p))}{c^2}
\]

Where:
- \(Z\) = Z value (e.g. 1.96 for 95% confidence level)
- \(p\) = percentage picking a choice, expressed as decimal (.5 used for sample size needed)
- \(c\) = confidence interval, expressed as decimal (e.g., .04 = ±4)

In using this calculator, the population size is ignored (left blank) when it is very large or unknown as was the case in this survey. This means that a sample of 500 people is equally useful in examining the opinions of a state of 15,000,000 as it would a city of 100,000 (Creative Research Systems, n.d.). Therefore, in order to draw meaningful conclusions from the data, a sample of at least 45 respondents was considered for the survey.

### 3.3 DATA COLLECTION TOOLS

This generally being an explanatory study, its success depended on the ability to capture the information needed to answer the research questions. The data collection tools that were used were

\(^2\) This Sample Size Calculator is presented as a public service of Creative Research Systems. You can use it to determine how many people you need to interview in order to get results that reflect the target population as precisely as needed.
namely: document reviews; personal interviews of sampled stakeholders; and written/self-
administered questionnaires.

3.3.1 Personal Interviews

With this tool, otherwise known as interviewer administered questionnaire, the interviewer asked
the questions face-to-face with the interviewee. These took place at venues mutually agreed
between the interviewer and the interviewee and this was mostly in offices, restaurants, and so on.
This method was chosen due the following advantages:

1. Interviews allow opportunity to clarify and restate questions whose meaning the respondent
   may not understand by using probes, thus eliciting more information.
2. The ability to find the target population easily and yield a high response rate.
3. Longer interviews are sometimes tolerated, particularly when arranged in advance. People may
   be willing to talk longer face-to-face than to someone on the phone.
4. Interviews provide flexibility e.g. can make use of visual aids.

However, personal interviews also have some challenges, for example;

1. Personal interviews usually cost more per interview than other methods especially during
   initial planning and field administration.
2. The interviews may not be as candid for fear of intimidation/victimization.
3. It is often difficult to locate respondents and set appointments successfully.
4. There is a risk of person-to-person bias say due to personality differences etcetera.

Nonetheless it was an appropriate tool for collecting information especially as regards the open
ended questions on issues such as policy.

3.3.2 Self Administered Questionnaires

The self-administered questionnaire method involved sending a set of well designed questions to
respondents via post, e-mail or hand-delivery. The respondents then filled out the questionnaire and
returned it to the researcher or had it collected from them. The questionnaires were designed in
such a way that they would provide respondents with a high level of comprehension of the research
subject in order to capture the required information in a clear and efficient manner. A case in point
was the use of the phrase ‘work from home or away from office’ rather than the term
‘telecommuting’ which many a respondent did not understand during the pre-test phase. In order to
ensure reasonable response rates, both the time and opinions of respondents during the pre-test
were considered.

Questionnaires have several advantages.

1. Questionnaires are among the least expensive.
2. They can be done with only the names and addresses of the target population.
3. Allows the respondent to answer at their leisure, rather than at the often inconvenient moment
   they are contacted for a phone or personal interview. They are thus not as intrusive as other
tools and tend to attract more honest responses.
4. They give respondents a sense of anonymity thereby affording credible responses. The self-administered questionnaires do however possess some drawbacks. 

1. They often take longer than other kinds since respondents are usually not as enthusiastic as the researcher to fill out the forms. This may lead to double mailing costs in trying to extract the completed questionnaires from the respondents.

2. They are prone to ambiguities as the respondents may interpret the questions differently from what was intended.

3.3.2.1 Pre-testing the Questionnaire

In this step, the questionnaire was tested with a small number of interviewees having similar characteristics to those of the target group of respondents before conducting the main interviews. This test run revealed unanticipated problems with question wording, instructions to skip questions, etc. It helped to ensure that the interviewees would understand the questions clearly and that the instrument served the purposes for which it was designed or required further revision. Among the feedback from this session was that the term telecommuting was inadvertently misunderstood from the onset hence necessitating a change of wording.

3.3.3 Document Reviews

In this method, documents that had relevance to the subject under study were reviewed. This involved reports presented by other research firms including the Central Bureau of Statistics, plans and frameworks presented to the government such as the E-government projects, program guidelines and policies, the millennium digital villages project, budgetary information among others. The annex of this report shall provide the list of reviewed documents.

A major methodical challenge for this tool was access to the said documents. Especially with regard to cabinet or government frameworks, it was very difficult to gain access to these documents since most are in hard copy, and/or kept under lock and key in various offices.

3.4 DATA ANALYSIS METHODS

The data that was collected was input in Microsoft Excel spreadsheets and by considering the various variables, MS Excel was used to manipulate the data and generate charts and statistics. The empirical observations were then compared to the theory and conclusions drawn from these. Therefore the data analysis was highly inductive and involved the following elements:

- Assessment of technologies available to support telecommuting, including performance, functionality, user interface and cost issues.
- A survey of the market with regard to available typical technical solution that can maintain connectivity of telecommuters to their workplaces.
- Perspectives of ICT practitioners such as Chief Information Officers and managers about the viability of telecommuting in Kenyan organizations.
• Cost-benefit analysis regarding the implementation of telecommuting in Kenyan organizations.
CHAPTER FOUR: RESULTS

This chapter presents and discusses the findings of the survey obtained through interviews, questionnaires, observations and document reviews. The purpose of the study was to establish the extent to which telecommuting has been adopted in Kenya and to investigate the challenges and/or drivers affecting the uptake of telecommuting in Kenya. The result of this study will be used as a basis for developing a telecommuting model that will highlight the set of methods (processes), technologies, and organizational changes necessary for successful implementation of Telecommuting.

4.1 THE RESPONDENTS

The sample used in the study was over 90 respondents with response ratios summarized below.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Count</th>
<th>Responded</th>
<th>Spoiled</th>
<th>Useable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Administered questionnaire</td>
<td>78</td>
<td>41</td>
<td>3</td>
<td>38</td>
<td>48.72%</td>
</tr>
<tr>
<td>Interviewer administered questionnaire</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>80.00%</td>
</tr>
<tr>
<td>Face-to-face interviews</td>
<td>10</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>70.00%</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>93</td>
<td>52</td>
<td>3</td>
<td>49</td>
<td>52.69%</td>
</tr>
</tbody>
</table>

Table 1: Survey statistics report

4.1.1 Gender Variation

Out of the respondents, the gender disparity was as shown in the chart below:

Figure 3: Respondents Gender

As indicated, the number of male respondents was higher that that of female respondents. This may be attributed to the fact that most of the people in formal employment are male.
4.1.2 Level of Education

The survey targeted the working population without discriminating their levels of education. From the data collected, it was observed that most of those employed today have at least a degree program and a good number are post graduates as shown in the figure below. This confirms that most of the employees have had some formal post-secondary education.

![Respondents level of education](image)

**Figure 4: Respondents level of education**

From this we can infer that the literacy level of the working population is above average and this is a significant enabling factor that should drive telecommuting. Besides the levels of education, it was also observed that over 95% of the respondents are confident around computers. It is therefore safe to say that most employees today can run applications, download and upload files, install/configure software, and do minor troubleshooting. This aspect is important as it implies that most of the respondents have the ability to get by with less dependence from the IT staff.

4.1.3 Organization Size

Another aspect of the survey was the size of the organizations that the respondents work for. The result was as follows:

![Organization sizes](image)

**Figure 5: Size of organizations the respondents work for**
As shown in the bar chart above, more than 50% of the respondents work for fairly large corporate organizations (with employees in excess of 50). This implies that should these corporate organizations choose to implement telecommuting programs, the effect is expected to be significant. This would be manifested by lower transportation demands, reduced environmental emissions, no need for more office space etc. The survey observed that most of the companies with the capacity to roll-out telecommuting are multinationals and large corporations. Nonetheless, these companies are not telecommuting in the true sense of the word. In fact one of such companies, a multinational, has implemented this concept in the sense of ‘flexible work hours’ program that requires the employee to be present at work at least part of the time of day even though he/she can connect and carry out their duties remotely.

4.2 DISTANCE AND COST

The survey included an investigation of the distances traveled by employees to and from work and the cost associated with commuting.

4.2.1 Distance and Time

The aspects of time and distance were studied in order to estimate the distances is traveled by employees and the time consumed by employees on daily commute. With reference to Figure 5 below, it was observed that many of the employees are compelled to leave their homes unnecessarily early each day in order that they get to their places of work on time. It is sometimes worse in the evenings. Going by the travel durations reported by the respondents, it is clear that due to commuting, children have less time with their parents and vice versa, and this contributes negatively to the quality of life among employees. Furthermore, the lost time is a cost to the company and the employee, time that would otherwise be used to do other tasks if telecommuting programs were in place.

The figure below show the responses to the question of the average time commuters spent on the road to work one way.
Figure 6: Average travel time to work one way

Again, the actual distance of the homes of the employees is as shown below.

Figure 7: Average distance from home to work

From the above data, it can be deduced that the average distance from home to work one way is approximately 12 km. This translates to approximately 24 km covered by each employee every day just to get to work.

4.2.2 Commuting Costs

The survey also sought to establish the direct costs incurred by employees as a result of having to commute to and from their places of work every day. These costs range from the money used to rent office space for the employee to the incidental costs the employee has to incur on a daily basis such as the daily parking fee or bus fare. Again owing to the fact that food bought from restaurants tends to be more expensive, it was observed that daily commute meant increased expenditure on food unlike if the employees were to eat from their homes. While observing that some expenses would remain unchanged whether an employee commutes or not, the survey involved asking the
respondents the approximate savings per month that would result from implementing telecommuting. The results were as shown below:

![Figure 8: Average cost of commuting](image)

Regardless of the means used to get to work, it can be observed that on average, each employee spends about Kshs. 5,000 extra, variable depending on the proximity of their residence to work and/or the means of transport used. In other words, this is the amount of money that would otherwise be saved if the employee were to telecommute. Besides, the employer also incurs additional costs to keep the employee at work. These include office space, parking space, maintenance, office administration, utility services such as cleaning etc. For instance, to lease parking space for employees today would cost on average Kshs. 5,000 per month per parking according to interviews with property managers.

### 4.3 WORKING FROM HOME

In order to determine the prevalence of telecommuting in Kenya, the survey set to establish the state of affairs around fundamental aspects of telecommuting with attention to the frequency and ability of working from home. In this regard a number of questions were posed to the respondents and their responses are here below presented and discussed.

#### 4.3.1 Take work home

Of the 38 employees who responded to this survey, 26 of them do take work home. Majority of these do take work home at least two (2) days a week, a clear indication that most of the work or at least part of it can be completed in the comfort of their homes. In fact one school of thought is that some employees do manage to complete their work at home due to fewer interruptions. This is further confirmed by the large number of respondents who identified ‘Less distraction from work’ is being one of the major benefits of telecommuting. See Figure 11. Again this large percentage is
an indicator that more and more people are joining the information age as the work done need not
be location dependent.

4.3.2 Can complete work at home

The respondents were asked if they would be able to finish their work on time if allowed to work
from their homes. The objective of the question was to prompt the respondent to give a self
assessment on their character. Telecommuting requires a lot of self discipline and hence the need
for both the employer and employee to chose carefully who can be put on the telecommuting
program. The responses to these questions were as follows:

Question: Would you finish your work in time if you were to work from home?

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>28</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Not sure</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 2: Ability to complete work on time

These responses indicate that a good number of employees believe they can complete their work at
home.

4.3.3 Nature of Job

Respondents were asked if their job would allow them to work at home during normal office hours
and the following was their responses.

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
</tr>
<tr>
<td>Not sure</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 3: Telecommunicable jobs

In this result, it can be observed that nearly half of the respondents hold jobs that can permit them
to telecommute while other jobs would not allow. From the face to face interviews it was observed
that some of the jobs involve a lot of physical tasks and face to face interaction was vital in order to
complete the tasks satisfactorily. Another reason was attributed to the lack of information systems
that can enable for example electronic workflows and approvals. This is further confirmed by the
17% of respondents (Figure 13) who identified the nature of their work as the main reason why
telecommuting may not have been implemented in their organization.
4.3.4 Telecommuting offer

As stated in the literature review, telecommuting should be something that the organization does not what an employee does once in a while. In this regard, respondents were asked whether they are indeed offered the opportunity to telecommute and their responses were as follows.

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>13</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
</tr>
<tr>
<td>Not sure</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 4: Offered opportunity to telecommute

With more than 50% of the employees interviewed not accorded the opportunity to telecommute, it is a clear indication that telecommuting has not yet taken root in Kenya. Therefore in as far as the penetration of telecommuting in Kenya today, the study revealed that it is still a new concept that has yet to be embraced by organizations as an alternative work option. In fact, as interviews with stakeholders revealed, telecommuting is a 'sleeping giant' in the phase of ICT innovations that include other products such as mobile banking and e-commerce.

4.3.5 Frequency of telecommute

Further investigation was done for those who do not telecommute to establish how many would be willing to telecommute if they had a chance. To this

If you were give the opportunity, would you work from home?

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Not sure</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 5: Willingness to work from home

The responses above indicate willingness of employees to telecommute rather than commute to their work places. This is an important prerequisite for successful implementation of any new system.

A further question put to respondents was how many days a week they telecommute or would like to telecommute.

How many days a week do you/would you like to work at home?

<table>
<thead>
<tr>
<th>No of Days</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>No of Days</td>
<td>No. of Respondents</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>TOTAL</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 6: Number of days worked at home

The above response indicates that a majority would settle for full-time telecommuting, followed by those willing to work away from the office at least twice a week.

### 4.3.6 Frequency of meetings

Meetings and the need for face-to-face interaction at work has been cited as a major factor in justifying the stereotype working from the office. In this regard, the respondents were asked how often they actually do hold meetings and the result is as shown in the bar chart below.

**How often do you hold meetings with your subordinates?**

![Figure 9: Frequency of face-to-face meetings](image)

It was observed that a very small percentage of the respondent do actually have daily meetings while the majority have monthly meetings. This means that telecommuting is still a possible work option insofar as meetings are concerned since telecommuters may still attend the said meetings without having to work at the conventional offices.

### 4.3.7 Telecommuting Proponents – feasibility

In mapping a way forward for telecommuting, the respondents were asked for their opinion with regard to whether telecommuting is feasible or not.

**In your opinion, would you support the idea of people working from their homes?**
From the above result, a massive 89% were in support of telecommuting. This may be taken as an indicator to the probability of telecommuting being a viable alternative to the conventional working from the traditional office.

4.4 TELECOMMUTING REQUIREMENTS

In order that telecommuting is implemented successfully, it is imperative that there exists adequate infrastructure to enable its roll-out and sustenance. In this regard the survey sought to establish a number of aspects regarding the existing infrastructure with a view of determine if indeed the same can be maintained in a telecommuting environment. The following are the areas investigated:-

4.4.1 Mode of communication

The respondents were asked to state the maid mode of communication that they use to communicate in their daily tasks and the following was the result:

As can be seen in the figure above, majority of the respondents do use e-mail. Even in the government offices where IT has been introduced and despite the use of e-mail not being according to protocol, the e-mails is still used then followed up with signed hard copy letters. This is an indicator of increased awareness and reliance on use of e-mails as a means of communication and this can very well be used in a telecommuting environment.
4.4.2 How many require computers to work

To establish the main tools of trade, the survey sought to determine how many employees require using a computer in their daily work processes. The results were as follows:-

In your work process, how often do you use computer facilities?

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>32</td>
</tr>
<tr>
<td>Most of the time</td>
<td>6</td>
</tr>
<tr>
<td>Occasionally</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

Table 7: Use computers to complete work

As indicated in the results above, all the respondents use the computer for their daily work processes with a large majority having to use it all the time.

4.4.3 How many can work on PC alone

Telecommuting is an ICT intensive undertaking and requires that the individuals have fairly above average skills in using computers. In this regard, one of the survey questions sought to establish the computer literacy of the average worker by asking the respondents to assess themselves on their ability to operate a computer. The result was as below.

Question: Which of the following best describes your interaction with computers?

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confident. I can run applications, download and upload files, install/configure software, and do minor troubleshooting</td>
<td>37</td>
</tr>
<tr>
<td>OK. I can use word processing software, and generally manage files</td>
<td>1</td>
</tr>
<tr>
<td>Uncomfortable. I have little experience using computers</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

Table 8: Computer literacy levels

4.4.4 Equipment necessary for Telecommuting

The respondents were also asked to state the main tools of trade that they would require to be able to work comfortably from their homes. To this the responses were as follows:
<table>
<thead>
<tr>
<th>Equipment</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>35</td>
</tr>
<tr>
<td>Printer</td>
<td>16</td>
</tr>
<tr>
<td>Copy machine</td>
<td>9</td>
</tr>
<tr>
<td>Facsimile machine</td>
<td>6</td>
</tr>
<tr>
<td>Modem (for internet)</td>
<td>34</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>23</td>
</tr>
<tr>
<td>Telephone</td>
<td>26</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
</tbody>
</table>

**Table 9: Telecommuting equipment**

As indicated above, the most needed items are a PC, the internet, Microsoft Office software and a telephone line. Of the few who required other equipment, it basically involved proprietary software. Again the result emphasizes the fact that telecommuting is an ICT-intensive program, understandably so since the physical commute is in effect replaced by telecommunication links.

### 4.5 BENEFITS OF TELECOMMUTING

The objectives of this project was not only to establish the prevalence of telecommuting and come up with a model, but also to determine some of the projected benefits of telecommuting over the traditional work styles. In this regards, the survey set out to establish the benefits of telecommuting as experienced by those already practicing and the following were the responses:

![Benefits of Telecommuting](image)

**Figure 12: Benefits of Telecommuting**

From the above bar chart, it can be observed that the key benefits of telecommuting are:
- Reduced stress
- More time spent with family
More flexible work schedules
- Less distraction from work, higher productivity
- Reduced costs (Travel, lunches, clothes, office space, etc)
- More control over one’s life

These findings were further corroborated by the results from the interviews in which most of the respondents pointed out that telecommuting is a more efficient way of working. Among the benefits, they listed the following;

- Less congested roads and city center
- Reduced costs of operation
- Better work-life balance
- Ability to use competent resources irrespective of location.

4.6 CHALLENGES TO TELECOMMUTING

4.6.1 Impediments to Telecommuting

The study sought to establish the main reasons why telecommuting may not be as popular as it ought to be despite the advantages it has over the tradition commute to office work style. In this regard, the respondents were asked the main reason(s) as to why telecommuting may not have been implemented in their organizations. The results were as follows;

![Figure 13: Challenges of Telecommuting](image)

As per the pie chart above, most of the respondents felt that the main reason as to why telecommuting was yet to be implemented in their organization was the lack of adequate communication network to support such a working environment. A similar number of respondents felt it is the need by management to supervise their staff.
4.6.2 Management approach

As indicated in the pie chart above, many employees feel management would not introduce telecommuting programs due their need to supervise them. In this regard, the management approach employed seems to be that of supervisory.

4.6.3 Factors affecting Telecommuting

For telecommuting to successfully deploy there needs to be adequate ICT infrastructure and systems. Kenya as a developing nation faces a number of challenges that have contributed to the laxity in the uptake of innovative programs such as telecommuting. To this end the survey went further to establish the extent to which some factors affect this uptake and the following were the results.

![Figure 14: Factors affecting/hindering telecommuting](image)

From the above results, it may be observed that the most respondents believe that the Management styles adopted in their organization as well as the technological capacity to support and sustain telecommuting are the two main challenges to telecommuting. True to this finding is the fact that Kenya being a developing country, is yet to realize advanced ICT infrastructure to support telecommuting.

The other significant challenge as established from the one-on-one interviews with key stakeholders was the fact that in Kenya today there is no legal recognition of e-transactions. This has prompted many a people to deal in person. Closer home, within the government, an e-mail does not hold legal representation and many of the officers have to follow every communication with a
hard copy letter even if a mail to the same effect has been sent. However, the law is currently under review to admit the use of digital signatures as a substitute/complement to the handwritten signatures. This will enable an employee to get approvals for most of the business processes from management without necessarily having to travel to the office.

Other issues identified from the survey as challenges to telecommuting include:-

- Lack of an institutional and legal framework to implement automated services including electronic transactions.
- Lack of standardization of components and systems being procured and applied across government.
- Limited country-wide ICT awareness that hinders cultural and attitudinal change.
- A wide internal digital divide between rural and urban areas as well as low bandwidth.
- Financial and human resource constraints.
- Bridging the ‘islands of automation’ by allowing sharing of information among agencies.
- High costs of ICT utilization and maintenance.
- High costs of migration from analogue to digital broadcasting.
- Challenge of obtaining a better integration of ICT solutions into company and public policies.

4.7 OTHER FINDINGS

In the course of the survey, the researcher sought to establish other factors that are likely to shape the way people work and hence influence the advent of telecommuting.

4.7.1 ICT Infrastructure in Kenya

There have been tremendous growth in the ICT sector the world over and Kenya has not been an exception. According to a CCK Sector statistics report (Communication Commission of Kenya, 2009), the telecommunication infrastructure received a major boost with the landing and commissioning of the East Africa Submarine Systems (TEAMS). Today the fixed line network registered subscribers reached 247,972 in the quarter ending March 2009. The fixed wireless subscribers stand at 448,529 in June 2009. The mobile services have also continued to be the most popular means of communication in the country with the four licensed mobile operators recording a combined subscriber base of 17.4M at the quarter ending June 2009. Besides, this, the operators have embarked on expansion of their networks especially in the areas of internet and broadband. There were 1.82 million internet subscribers at the end of June 2009 and 1.80 million mobile data/internet subscribers making a total of about 3.6 million internet users.

This statistics in no doubt signify a positive trend towards use of ICT in the day to day activities of the populace especially within the urban areas. Given that Telecommuting depends directly on the infrastructure available, the current trend clearly paves way for the emergence of telecommuting. The preceding paragraphs depict some of the developments that have come alongside these developments.

The researcher found that the infrastructure upgrades to technologies that support high capacity services has opened more possibilities. For instance the migration to third-generation (3G)
technology has enabled a more computer-like experience on tiny devices such as the Blackberry. Blackberry uses a compression feature that enables effective use of bandwidth and faster email download speeds. Furthermore, its MDS feature allows for remote access to company systems and applications especially when used together with applications such as those from Rove, which give users the power to manage networks, access terminals, control desktops, run applications, manage files and much more from anywhere using their handheld devices (Rove Mobile Admin Architecture, n.d). Among the largest beneficiaries according to one of the providers are the sales people who no longer need to return to base after every sale by giving them wireless access to CRM systems that allow them to place orders on the spot. This concept has taken collaborative computing to a new level that could make telecommuting a possibility.

4.7.2 Government Effort

The Government of Kenya recognizes the importance of ICT in economic development. In this regard, it is pursuing to improve ICT infrastructure in order to bridge the digital divide and lower the cost of communication (Office of the Prime Minister, 2008). The Government is also leveling the ground through development and implementation of policy and regulations aimed at attracting investment within the sector. To this end, the Government has liberalized the mobile cellular market and the international gateway leading to many players in the sector providing satellite based broadband access. This, according to CCK, has brought about competition that is driving down the cost of communication. As a result also, operators are now offering internet access products mostly on broadband technologies including Code Division Multiplexing Access (CDMA), WiMAX and now 3G (EDGE and GPRS).

The cost of communication has remained high especially due to the fact that Kenya relies on Satellite communication for its gateway to the internet backbone. The government has thus embarked on several projects to develop affordable ICT infrastructure with a view to build an information economy.

a. The East African Marine Systems (TEAMS) that will connect the Kenyan coast to Fujairah port in the United Arab emirates thereby providing quality broadband connectivity to the internet backbone currently provided though the slow expensive VSAT. The project is being implemented in an open access model where operators in the region, through the Public Private Partnership Initiative (PPP) have invested in a special purpose vehicle.

b. National Terrestrial Fibre Optic Network project (NOFBI) intended to complement the TEAMS project by ensuring maximum utilization of capacity and connectivity in all districts in the country.

c. Government Common Core Network (GCCN) that will function as a shared and secure interoperable government-wide ICT architecture which will not only integrate work processes and information flows, but will also improve inter-ministerial sharing of databases and exchange of information. This will also eliminate duplication and redundancy, improve public access to government services and ensure responsiveness in reporting, monitoring and evaluation.
d. Kenya Transparency Communication Infrastructure Programme (KTCIP) that aims to ensure equity in the provision of ICT services across the country. It touches on two main areas namely establishment of digital villages at constituency level and Bandwidth subsidy for key learning, social and government institutions.

e. The Government Data Centre (GDC) that will be set up to provide storage for all government databases. In addition, the Neutral Data Centre (NDC) will provide world-class services to government ministries, departments and agencies, private sector operators and businesses. This will be a major enabler of telecommuting as access to information will be easier.

f. Zero-rating taxes on ICT infrastructure will promote affordability subsequently increasing penetration and reducing the cost of customer acquisition of the necessary equipment to support telecommuting.

g. National ICT Centers of Excellence are also planned so as to develop a critical mass of human resource required to support capacity for the industry. This is due to the fact that the computer literacy levels especially within the civil service are still very low. This in terms of telecommuting will demystify ICT and people will be more confident to work independently from anywhere.

h. Introduction of E-Service within the Civil service has seen the Government install Local Area Networks (LANs) in all Ministries/Departments headquarters, acquire of ICT hardware and software and deploy integrated government-wide information systems. Such systems include the Integrated Financial Management System and Integrated Personnel and Payroll System, online recruitment and selection system, online exam results and pension system. With such infrastructure in place, it will be much easier for civil servants to work from anywhere – telecommute. Spearheading these initiatives is the government sponsored e-government secretariat. Among its achievements has been the establishment of a web portal - http://www.kenya.go.ke through which websites for all ministries have been created and email systems enabled for communication between government agencies as well as its citizens.

Other initiatives have been undertaken by various organizations to improve this very challenging phenomenon of connectivity. For instance, the World Bank embarked on a 10-year, multi-country Regional Communications Infrastructure Program (RCIP) to assist Eastern and Southern African countries to implement a strategy of effective connectivity by among other activities, financing coordinated backbone deployment to avoid redundant infrastructure initiatives and focus on missing links, and supporting the development of e-government applications and content to complement the deployment of the regional infrastructure (Environmental Resources Management, 2007). At the end of this program it is expected that all capitals and major cities in East and Southern Africa should be linked to the global Information and Communications network through competitively priced high-bandwidth connectivity. This in effect will tremendously improve the connectivity challenge. This initiative is being driven by the Kenya ICT Board.

4.7.3 Cultural challenge

It was observed that inasmuch as most respondents prefer to telecommute, a small number would not like to work from home in spite of all the conditions being right. This is a pointer that some
employees may not take up telecommuting simply because they are not willing to let go of the culture of reporting to work.

Again, it was observed that even though most private businesses begin at the owner's home, some proprietors are forced to rent an office in order to win the confidence of their clients who associate the location of a company's offices to the company's stability and capacity. This culture may actually work against those wishing to telecommute.

4.7.4 Real Estate Situation – Association of office location with prestige

The researcher also sought to find out some information regarding the possible savings on cost of office space that can be realized by the use of Telecommuting.

It was established that office space is charged per square feet with the main determinants being security; parking spaces, accessibility, power back up facility among other aesthetics. Usually the tenant would pay for actual office space, parking spaces taken, electricity based on usage, service charge (water, cleaning, maintenance, etcetera). At the time of carrying out this survey, the rates for office space within the CBD were ranging between Kshs. 80 to 120 per square feet per month and service charge of Kshs. 22/= per sq ft. The tenant would typically be required to take a lease of at least one year. While parking would be Kshs. 4000 per slot per month. The rates are higher in the up-market places such as Westlands and Yaya and are in the range of Kshs. 140 per square ft per month while other regions in the industrial part of the city and areas beyond a 15km radius from the CBD charge lower than Kshs. 80 per sq. ft.

On the demand side of the equation, it was established that organizations dimension their requirements of office space based on the nature of business being undertaken and the need for meeting rooms among other factors. It was further observed that in dimensioning an open sitting office, organizations of less than 10 people would typically take up 800 square feet office space whereas those with 10 to 30 people would require between 1500 to 2000 square feet. Organizations with more than 50 employees would need 5000 square feet and above. These sizes can increase depending on the type of sitting arrangement and office partitioning used. In the case where employees use individual offices, each employee would then require about 250-300 square feet. Total office space is not directly linked to the number of employees due to nature of business and use of common areas. Therefore for a typical organization with a mix of individual offices as well as open space sitting, the average space requirement per person would be in the range of 150-200 square feet. Taking an average of 175 square feet per person at a price of Kshs. 100 per square feet worked out to a real estate cost of approximately Kshs. 17,500 per employee per month.

It can thus be observed that telecommuting can reduce the real estate cost by more than 50% if an organization were to run a full telecommuting program retaining only enough space for the jobs that cannot be done remotely and for occasional in the office working by some of the staff.
CHAPTER FIVE: DISCUSSION

The survey involved in-person discussions/interviews, document reviews and questionnaires in which a number of issues regarding telecommuting were studied and the results and findings have been presented. In this section, the findings as obtained and observed in the previous chapters shall be used to develop a Telecommuting model that may be used as a guide to successful implementation of a telecommuting program in a given organization. This model may also serve as a source of information to help create awareness in the private and public sectors. For instance, the model may prompt the Government of Kenya to formulate necessary policies and initiate campaigns towards a ‘telecommuting society’ thereby increasing its uptake in the public and private sectors.

At present, there is no framework for telecommuting designed for Kenya considering its unique infrastructural challenges. Much has however been done in the field of e-learning and e-commerce. In developed countries, there are several telecommuting frameworks some of which are considered here. These include the Queensland Framework (Department of Industrial Relations, 2002); A Guide for Managers, Supervisors, and Telework Coordinators (US Federal Government, 2003); and a Telecommuting Guide – Smart Valley® (Benhamou et al., 1998). These frameworks and guides were based on research projects carried out in the respective countries, usually under the sponsorship of their respective governments and various donor agencies. The frameworks have been subjected to further reviews and the feedback obtained thereof used to refine the frameworks.

Clearly, there are outstanding differences between the developed and the developing countries especially with regard to the environment of ICT offered by a given country in terms of the digital divide and network readiness as portrayed by the Networked Readiness Index (NRI) (Dutta & Mia, 2008). Cultural differences, institutional or otherwise, and the different degrees of computer literacy influence the readiness of the community’s key stakeholders (individuals, businesses, and governments) to use ICT. These factors makes such models not usable in an off-the-shelf manner and hence the need to carefully craft a framework that works in these special circumstances.

5.1 THE TELECOMMUTING MODEL

This model outlines the summary of aspects that would pertain the setting up of a telecommuting program within an organization in Kenya. It is more or less a telecommuting manual that includes the Telecommuting policy, the Telecommuting organization and allocation of responsibilities, schedules, procedures, instructions and other internal documents that can be used for telecommuting management and control. Technological platforms for Telecommuting including the capacities. The corresponding costs and benefits are outlined herein. The model further identifies key risks and respective mitigation and control measures.

This model shall serve only as a guide or reference and it is hoped that it may help users to customize their own telecommuting programs that meet the particular needs of their respective organizations putting into consideration their various conditions.
Frameworks have typically been developed by improving existing ones through adaptation or modification. The model proposed herein will be based on the Cisco model (Benhamou et al., 1998), upon which the local factors, as identified in the survey, will be incorporated to make it practicable.

5.2 DEFINITION OF TELECOMMUTING
Telemcommuting is a fairly new concept especially in a developing country such as Kenya. Otherwise referred to as teleworking, Telecommuting may be defined as an alternative work arrangement for employees to conduct all or some of their work away from the primary workplace. In other words, the daily physical commute to a central place of work is replaced, in part or whole, by telecommunication links. It is important to note here that in order that the relevant benefits are realized; telecommuting needs to be something the organization does and not just an individual. Judging from the impact of mobile telephony in Kenya today, it is expected that broadband would present countless opportunities that will change our lifestyles, telecommuting being a major possibility.

5.3 TYPES OF TELECOMMUTING
Telecommuting would exist in a number of forms depending on the nature of the organization and the tasks at hand and also the circumstances under which such programs would be running. However, it is necessary to state that mere checking of voicemail and emails from home in the evenings and weekends would not pass for telecommuting. Instead, telecommuting should be something an organization does, along with the relevant policies. In this regard, the various forms of telecommuting programs are described below.

5.3.1 Work at Home
This is where the employee designates workspace at his/her home to conduct work-related duties during the normal working hours. In this arrangement, it is important that the organization guarantees a conducive environment before an employee is allowed to telecommute. The following may thus be considered:

a) **Workspace:** The Employee needs to have an adequate office setting necessary to accomplish his/her work requirements. This include a desk, filing cabinet, computer, stationery, telephone set, printer (if necessary) among other necessary items that would usually be provided to the employee if he/she were working from the office. The organization need not provide items that an employee already has. However where items are missing, the company may consider supplying the same with clear use policies governing the use and maintenance of such items. A clear inventory should be maintained to keep track of the organization’s property at employee residences.

b) **Utility:** This includes the services that are required by the employee and the costs incurred thereof as a direct result of working from home such as electricity bills, telephone bills etcetera. Typically there would be a cost-sharing plan between employee and employer. Alternatively,
either party would foot the bill provided the necessary policies are contained in the organization’s telecommuting manual.

c) **Connectivity:** In order that the employee can efficiently receive and submit work to and from the office, there needs to be in place an efficient and reliable connection for both Voice, Data and where possible Video. In this regard, the company may supply the employee with a telephone handset - mobile and/or fixed line. For data/internet connection, the company may supply a suitable link. Again, there would be in place a Phone and Data use policy to govern the use of these devices.

d) **Security:** As more organizations become information/knowledge based organizations, the aspect of security takes centre stage when formulating ways of working. In such organizations, information is the second most valuable asset next to personnel. In establishing a secure system, the company must strike a balance between the risk of damage and the cost of protection. Therefore, the solution chosen thereof must have an inbuilt security component. A typical approach has been the use of VPNs combined with security token keys.

e) **Health and Safety:** The safety of the employee while discharging duties to the organization is and remains a concern of the employer. Hence in setting up a telecommuting program, the organization needs to address issues of health and safety of the employee in terms of adequate lighting, ventilation, fire readiness. In so doing the organization may have in place a requirement to always report accidents and injuries immediately to supervisors. Further to this, clear policies surrounding injuries while doing office work in the house need to be in place along with the necessary indemnities prior to commencement of the program.

### 5.3.2 Hoteling

This may be defined as a ‘just-in-time’ concept for workspaces where vendors provide shared workspaces, complete with all the necessary business equipment, where workers check in and out as and when need and pay only for usage. This usually used for temporary office spaces to complement work from home such that in case of meetings or peaks, the employee can check in a workspace and as soon as work subsides, move back to their homes. It is also popular with mobile workers e.g. sales people moving from region to region.

### 5.3.3 Satellite Office

This is where an organization sets up a remote office in the locality of a high concentration of employee residences thereby allowing some of them to work from these locations rather than having to commute to the main office facility. In this way, the organization may assure adequate workspace for its employees while saving time on the employees by significantly reducing or eliminating physical commute. This is suited to situations where an organization's workforce resides in a given location or housing scheme. Today, the trend has been that organizations are taking to house their staff and this makes telecommuting the next logical step to tackle the challenge of office space and commuting.
5.3.4 Neighbourhood Work Center:

This is where public facilities house employees from different organizations with each organization meeting the administrative and technical requirements of their employees. In Kenya this concept is being run under the brand of Business Centres. This is where a set of fully furnished and equipped offices with telephone, desk, computer, internet and common facilities such as board rooms, reception area and support staff. The tenant can then rent the office on a daily, weekly or monthly basis. On a national level, there are plans to have a large Business Centre particularly with the upcoming Business Process Outsourcing venture. Such office can come in handy in promoting telecommuting. With these offices being set in peri-urban and rural areas raises the bracket of people who can telecommute while avoiding distractions from home.

5.3.5 Virtual Office

This is a concept applicable to employees who are constantly on the road using technology as the main link to centrally located resources.

5.4 THE TELECOMMUTING BLUEPRINT - A MANAGEMENT PERSPECTIVE

Telecommuting was defined as something an organization does rather than what an employee chooses to do once in while for convenience's sake. In this regard, management play a vital role in the direction an organization takes with regard to Telecommuting. For a successful uptake of telecommuting, managers and supervisors have to be on board from the very beginning as they make the strategic decision of whether or not to go the telecommuting way. At the tactical level, they identify eligible positions and employees, set performance expectations and parameters for telecommuting arrangements and monitor productivity. It is therefore important that the telecommuting program has the blessings of top management even though the actual implementation may be the task of their appointees. The following is an overview of the telecommuting program from a management perspective.
With reference to figure 14 above, the process starts by the top management appointing a telecommuting committee to steer the implementation of the program. By so doing the top management commits itself to the cause and thereby guarantees sponsorship of the program. The telecommuting committee then draws up the telecommuting objectives based on their assessment of the company activities and consultation with top management and employees. A telecommuting policy is then drafted to reflect the goals while laws and regulations are drawn up to ensure the goals are achieved. It is on the basis of the policy and goals that specific telecommuting activities such as time reporting, employee screening, etcetera, are carried out and the employees start telecommuting. The goals are then followed up to ensure the program is still on course and necessary measures taken to keep it on course. Periodic management reviews may follow to introduce improvements.

5.5 DIMENSIONS OF THE TELECOMMUTING MODEL
Underlying the above management perspective is a tactical approach to the telecommuting program. This comprises the issues that have to be considered in detail when implementing a telecommuting program. The major areas of concern, herein referred to as domains, are namely Management, Administration, Employee, Technology and Monitoring. These may be tabulated as below.
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**Table 10: Dimensions of the Telecommuting Model**

**5.5.1 Management**

**5.5.1.1 Telecommuting Proposal**

The formulation of a telecommuting program may begin by a preliminary assessment of an organization's situation through which the organization may recognize a problem or an opportunity to which telecommuting could be one among other solutions. The preparation and presentation of a Telecommuting Proposal to the management team would then follow. The proposal may give a high-level view of what the program is all about and how it can be used within the organization. The management would then make the strategic decision to allow further study of the possibility of telecommuting. This would typically be followed by appointing of a steering committee usually known as the Telecommuting Committee.
5.5.1.2 Telecommuting Committee

The strategic decision to go telecommuting by top management marks the first step towards a telecommuting organization. This decision is important as it guarantees sponsorship of the program as well as the corporation of the decision makers along the implementation path. The output of such a decision is the appointment of a responsible person to oversee the implementation. In fact it is best to put in place a Telecommuting Implementation committee to plan the telecommuting program, monitor progress, and assess the need for changes and improvements that will ensure success of the program. The telecommuting committee will therefore be responsible for determining the program objectives, the potential and intended outcomes, evaluating the working environment (resources, employees, company policies) and identifying potential courses of action throughout the program lifecycle.

In constituting the committee, it is important that all the key stakeholders are involved. For instance, you may include a representative from the Human Resource department as well as an employee from each department. This group can help carry out a self survey of the organization to ascertain the viability of telecommuting, establish program goals, objectives, written policies, and procedures. The Telecommuting committee will for each of these aspects come up with the options that suit their organization.

5.5.1.3 Feasibility

Inasmuch as telecommuting has rather obvious benefits from the outset, it is not always applicable for every organization. It is therefore important that before an organization embarks on a telecommuting program, they carry out a thorough feasibility study to ascertain the viability of the program especially with respect to their own activities. This may include identifying if there are positions within the organization that are telecommunicable, doing a cost benefit analysis to determine if telecommuting would really add value to the organization. The assessment may be in the form of a self study that looks at the current ways of working in the organization and the problems that telecommuting would help solve. Telecommuting programs are more likely to succeed and thrive when they are integrated with the company’s overall long-term business strategy. In assuring viability, other factors such as connectivity may be tested through a small scale pilot roll-out or otherwise.

An important aspect of this feasibility study is a risk assessment in which the management takes stock of the obvious risks, and possibly formulates the necessary mitigating measures. The result of the feasibility study will from the basis upon which the management may decide whether or not the organization should go the way of telecommuting.

5.5.1.4 The Telecommuting Policy

Telecommuting has been defined as an agreed agreement between employer and employee, rather than something the employee does occasionally for convenience’s sake. Many an organizations have indeed implemented telecommuting from an employee perspective where it is the employees who put pressure on the management to allow them to telecommute in order to cope with a
situation such spousal transfer. This approach of telecommuting is always short-lived as it is seen as a benefit to the employee and the necessary cost savings and program benefits are not recouped. Again the program stops with the subject employee leaving the organization or retiring. It is for these reasons that telecommuting should be organization-driven rather than employee-driven. There is need therefore to have this implemented through laid down procedures in the form of a Telecommuting policy. The Telecommuting Policy Statement of the organization must be in writing and prepared in consultation with employees and other stakeholders such as trade unions where applicable. It is recommended to appoint a Telecommuting Committee that will plan the program, monitor progress and assess the need for changes and improvements going forward. Senior management must also endorse the program and show clear ownership of the program.

The policy may outline the program definition, the objectives and goals of the program as well as the benefits to the organization and to employees, putting in consideration the size and nature of the organization. The Policy should as well expound on the risk assessment report established in the feasibility study and make provisions for mitigation to ensure success of the telecommuting program. Through the policy, there should be commitment by management to:

(i) Facilitate telecommuters to do their work through necessary benefits and compensation schemes, say cost sharing for power and telephone (utility) bills.
(ii) Protect the health and safety of employees
(iii) Treat all employees without discrimination between telecommuters and non-telecommuters.
(iv) Continuously seek to improve the performance of the telecommuting programs.

The policy shall also address issues such as the procedures for participation in the program, time reporting, expected work environment, management of telecommuting, monitoring, employee insurance, terms of engagement, etcetera. The policies should go as far as stipulating the roles and/or obligations of the employee and the manager in the telecommuting program and make provision for evaluating the program periodically. All participants must know what the guidelines and expectations are and who is in charge of the various aspects of the program. The policy may be adopted as an addendum to the HR policy or may be in-built into the existing HR Policy.

For organizations already telecommuting, the policy should be reviewed regularly to improve with technology and changing work demands.

In drawing up the policy, the Telecommuting Committee should have representatives from the IT and Human Resource departments and some of the managers. Furthermore, the Telecommuting committee may come up with the following documentation as a package to facilitate successful roll-out of telecommuting programs.

- Sample agreement to be completed by the employee and supervisor
- Supervisory checklist
- Home safety checklist
- List of possible logistical support items available from the company
- List of telecenters and the procedures for using a telecenter
Some of the aforementioned issues are here below addressed.

5.5.1.5 Organization Design

This refers to the aspects that must change within an organization to make telecommuting a reality. Organization technology (the science of integrating technology and people) indicated that three components of organization must change as illustrated in the figure below:

![Figure 16: Organizational Technology](image)

- **Structure** – How we organize accountabilities in terms of say approvals, supervisors etcetera. This aspect determines the approach an organization takes in implementation and administration of telecommuting.
- **Process** – The core processes defining what the organization does and this will mainly touch on work flows and instructions.
- **Culture** – Includes the values, styles and rewards that characterize the organization and support core processes. Such issues as management styles and employee attitude are to be considered here.

Organizational technology then defines what structure, process and culture must look like to successfully integrate people and technology (Heneman, Greenberger, & Innis, 2002). Telecommuting depends largely on the ability of the employees to effectively use available technology to carry out their duties hence organizational design is vital to the success of telecommuting. The telecommuting steering group will therefore have to search for and evaluate alternatives, select appropriate software, hardware, tools, connection, etc to ensure the smooth operation of the program. In addition to this, the organization should be generally supportive of flexible work arrangements.

5.5.1.6 Management Styles

As a matter of fact, building trust between the employees and managers remains a big challenge to the uptake of telecommuting. Managers accustomed to managing by walking around and observing employees are faced with a dilemma ‘How can I manage what I can’t see’. The thing to remember here is that true control does not come from face to face contact but from an employee’s sense of personal ownership of the business process and its results (Heneman et al., 2002). There is need
therefore to re-orientate the managers to embrace management by results rather than by the clock or ‘face time’.

Managers and supervisors are key players in the telecommuting program in the sense that they set the parameters of the program and decide whether or not a telecommuting arrangement is feasible. They also define telework for their organizations and/or departments (US Office of Personnel Management, 2003). Studies show that clear guidance and direction increases the chances of success for telecommuting programs and when managers approve of a telecommuting arrangement, they provide support, guidance, and ongoing evaluation for it.

5.5.1.7 Management Review

Once the program has been rolled out in an organization, it is necessary that the management team meet periodically to analyze the progress of the program as well as introduce checks and balances that will optimize the program.

5.5.2 Administration

This refers to the part of the organization that is concerned with the day to day operation of the telecommuting program. They involve the departmental managers, supervisors and the Human Resource personnel. Once the Telecommuting committee has defined the policy and goals of the program, the managers and supervisors implement the program at the operational level. Among the tasks under telecommuting administration is determining who telecommutes, signing telecommuting agreements with employees, monitoring the performance of telecommuters among other activities, some of which are reviewed below.

5.5.2.1 Who Telecommutes

It is important for the program administrators to determine who telecommutes in a systematic manner, perhaps with the help of supervisors. Telecommuting successfully depends on the right mix of many variables including the right jobs/tasks, people, organizations, and home-office settings. The telecommuting policy would generally give the guidelines as to who telecommutes. A suggestion is to implement telecommuting as a privilege where aspects such as employee discipline are considered. Clearly again, not all jobs can be accomplished away from office and there will be need to identify which jobs can be put on telecommuting programs. It must be understood that the suitability of a given job position depends on the work content rather than position.

Telecommuting may be deemed feasible for the following situations:-

1. Work that requires thinking and writing, such as data analysis, reviewing grants or cases, and writing regulations, decisions, or reports;
2. Telephone-intensive tasks, such as setting up a conference, obtaining information, and contacting customers; and
3. Computer-oriented tasks, such as programming, data entry, and word processing.
This list is growing everyday as more and more jobs are reorganized and computerized. It is not enough for the position to be suitable for telecommuting. The telecommuter must also be up to the task.

It is indeed a challenge in determining who should or should not telecommute. To do this, it is recommended that the supervisor views all positions as eligible for telecommuting. Another approach is where, employees apply for the telecommuting option and then the management, through the human resource department, evaluates the applications case by case and determines whether or not the employee may telecommute. To aide in this phase of telecommuting an employee screening system may be devised. This would include carrying out a telecommuting readiness assessment for each employee. In order that the program may succeed, the telecommuter ought to have the right job, a good job performance record, have the right home office environment and posses social independence skills among other aspects.

5.5.2.2 Telecommuting Agreement

Once the company has put in place a policy to support telecommuting, an Employee Telecommuting Agreement that sets the basis on which the employee will be authorized to work from home should to be put in place. A frame agreement may be drawn as a template and edited for actual agreements with the telecommuting employees. Among the issues the agreement should address include the responsibilities of the employee, the managers and all other relevant aspects pertaining to the implementation of the program such as routine checks, leaves of absence, indemnity clauses as regards health and safety, etcetera.

5.5.2.3 Monitoring

In a telecommuting situation, performance must be measured periodically and the results used to improve the program. Unlike the office set-up where supervisors can observe the performance of activities by an employee, telecommuting demands measuring of results rather than activities. Quantity, quality, timeliness, and cost-effectiveness are some of the general measures that supervisors may use. Thus, telecommuting requires a results-oriented management approach: managing the work instead of the worker. Today there are a number of applications that can further be used to enforce and guarantee the availability of the employees. An example is the use of Oracle’s web-based PeopleSoft suites and other time reporting applications. Such systems can allow all or part of the company’s business functions to be accessed and run on a web-client (PeopleSoft, 2009).

Workforce performance management is one of the fastest growing segments of the Human Capital Management (HCM) software market. Research continues to provide conclusive proof that leading organizations have strong performance management practices which would seamlessly accommodate employees working from home.

To further enhance performance, the management may put in place a number of incentives in the program based on performance such as extra-leave days in order to encourage employees to join the program and exploit it to the possible extent thereby ensuring its success.
5.5.2.4 Maintaining and Supporting Teams

Due to lack of frequent face-to-face interaction, telecommuting has the potential of breeding individualism and killing the team spirit in an organization. Managers and employees are often afraid of losing the informal conversations that they are used to having in the office where for instance one can interrupt another to get clarification. Thus when considering a telecommuting program, one needs to structure communication effects that have always been taken care of informally through technology in order to keep communication channels open.

Using appropriate technology, collaboration software exists that can help maintain such links. Internal news groups can be used to generate on-line discussions of telecommuting issues. Chat rooms can be implemented to gather information in real-time, substituting for live focus groups. Some face-to-face meetings can be organized to make employees meet and touch base as well. As noted by Heneman et al. (2002), there are certain interactions that need to be handled in person as faxes and teleconferencing cannot replace human contact. Continued lack of contact leads to a deteriorated human relationship and human trust among employees and with management. This therefore is a concern that the organization has to address when implementing telecommuting.

5.5.2.5 Evaluation

The telecommunicating program and telecommuters should be evaluated periodically in order that the program may be sustainable. Key issues for evaluation for most agencies include the effect of telework on productivity, operating costs, employee morale, recruitment, and retention. Also to be evaluated are the employees' remote access needs to ensure effectiveness and efficiency of the program.

The technology used to provide telecommuting within the organization may also be used innovatively to give such evaluation. In fact surveys that were once expensive in terms of printing, mailing and compiling hard copy questionnaires are now simplified to simple mails or even better online responses by the participants through the internet/intranet. The company's network utility statistics can also be used to provide information about the remote access users in terms of say what time they log in, how much traffic is uploaded or downloaded, how many successful hits are made etcetera. These results can then be used in the evaluation and where necessary, improvements undertaken to make the program more successful. It is important that such feedback is shared with the users and management alike and this is likely to encourage their participation in the evaluation as well as give employees the feeling that management is concerned about their work activities at home.

A sample of an evaluation sheet is attached in Appendix B.

5.5.3 Employee

Telecommuting substantially changes the way we do work and the employee often determines whether or not the program succeeds. It is therefore vital to ensure that the program gets acceptance from the employees and that the employees are adequately equipped to handle the program.
5.5.3.1 Focus on Education

Employees and managers have different interpersonal and technological needs and it may not be obvious to know their training needs. Telecommuting being a technology-based undertaking requires one to possess a certain comfort level with computers, software, online service providers, collaboration/telephone systems etcetera. For instance it will be necessary that employees know how to use laptops or their personal computers to access the company’s database, and upload/download documents. Other than technology, employees may need training on soft skills such as time management, communication, etcetera. It is therefore necessary that when rolling out a telecommuting program, the administration together with the managers and supervisors analyze and determine the training needs of the workforce, paying attention to objectives and goals of the telecommuting program. Where applicable, a representative from the training and/or HR department should form part of these discussions so as to develop an appropriate training program for telecommuters and supervisors. Besides improving the capability of employees, the training forums can present opportunities to pre-empt likely problems and instead equip the telecommuters with possible solutions and other best practices that will ensure successful implementation of the program.

5.5.3.2 Employee Screening

Even though, the strategies, parameters and criteria of choosing telecommuters may vary from one organization to the next, it is recommended that telecommuting needs to be voluntary. This way, the employee will be an active participant resulting in a win-win scenario for the stakeholders. At the same time, it should not be a right that the employee is entitled to. In order to achieve this balance, employees should as well be required to apply for this service at which point management can vet the applications based on a predefined criteria. The employee may also conduct a self-evaluation to accompany his/her application, and this may be used as input to the screening process. Potential telecommuters may be assessed based on the criteria below:

i.) The individual’s work responsibilities – To determine if indeed the tasks can be completed off site.

ii.) Self-Motivation – Necessary to ensure an employee can drive himself to complete assigned tasks without supervision.

iii.) Performance – Telecommuters should be good performers to guarantee better productivity with telecommuting.

iv.) Work space – An assessment of the employee’s work environment to ensure it is appropriate to enable him/her to work efficiently and effectively.

This criterion is very subjective and may need the participation of all stakeholders especially the managers, while keeping the interests of the organization in mind.

5.5.4 Technology

The backbone for telecommuting is Information Technology (IT) and specifically the element of connectivity. It provides the data and communications platform that will help the organization to
link and leverage its human capital to achieve a competitive advantage. A good IT system allows an organization to store and retrieve large amounts of information efficiently and cost effectively. Today's technology provides a variety of solutions that can meet this requirement and the key therefore lies in choosing the right solution for your organization. Therefore in driving a telecommuting initiative in an organization, it is important that management identify, partition and prioritize IT applications to assure success of the program. To start with, one can think about the computing resources and the type of applications used in the office each day. In this regards, there are a number of essential issues that have to be considered:

5.5.4.1 Automating Work

Typically, automating of routine activities at work is the starting point for most organizations in IT utilization. As observed in the survey, one of the challenges to telecommuting is ‘Reorganization of work to enable it to be done outside of the office’. The level of automation should ideally be one of the criteria to be checked before an organization decides to go the telecommuting way. In many cases, the organizations make use of a combination of internally developed applications and standard applications and resources on the workstations. Whatever the case, the management has to ensure that the telecommuters can still access these applications and carry out their daily routines from wherever they are. It is the trend to make the organization’s software e-business ready through say making applications that are deployable on the internet/intranets/ extranets and accessible by web browsers. In fact, most enterprise solutions (such as supply chain management, logistics, accounting, customer relations management, etcetera) are now in-built with support for internet standards, web-based deployment and browser-based access. Therefore organizations that already have this in place can have a head-start in deploying telecommuting.

5.5.4.2 Telecommuting Devices and Services

An important part of successful implementation of telecommuting programs is the availability of the tools of trade - the computing resources. These include physical devices and systems as well as services necessary to support telecommuting. It is important that the management analyses the computing needs of each employee in order to ensure that there are adequate facilities to support telecommuting demands. In many cases, telecommuters will use nearly the same resources as those on site except where the economies of scale is lost due to lack of shared facilities such as printers. Nonetheless, the printers supplied to employees may be of lower specifications hence the total cost of ownership may not escalate as much. The following are some of the key devices that today can enable a telecommuter work effectively.

i.) Computers: This is the most commonly used device for routine jobs. Competition and favourable tax tariffs have combined to greatly reduce the cost of computers to the extent that most organizations in Kenya today, can afford to allocate desktops to all employees who need them even if only for word processing tasks. The computer specifications may vary depending on the employees job requirements. Laptops prices have also been dropping tremendously and are no longer a preserve of the rich. Consequently, mobile computing has become a common
phenomenon. In fact most corporate organizations issue each employee with a laptop as part of the basic tool of operation.

ii) **Printing Devices**: Some employees may need to deal with hard copies of documents and so may need to use the printer. Advanced low cost printers are today available especially with multiple functionality for printing, copying, scanning and faxing. Again with each deserving employee being entrusted with a printer, there is usually greater sense of responsibility and as such the operation costs may even be lower. Another option is the use of a copy centre in the employee’s locality, especially for those who need to print only occasionally.

iii) **Communication Links**: To successfully telecommute, the employees must have access to the computing resources they need to do their job. To do this, there is need to have communication links for data, voice and/or video to enable them upload and download documents away from home with as much ease as they would in the office. The choice of the communication link will depend on the type of information that will need to be transmitted and the frequency of use. Also whether users use terminal access, file transfer or both to connect to applications in the main office may determine the solution chosen. Nevertheless, cost, capacity/speed, availability and reliability are often the key factors to consider when choosing which communication solution to implement. Today, there are many options to choose from and here below we list a few.

a. **Mobile broadband**: Mobile operators are today upgrading their networks to Third Generation (3G) mobile technology, which offers superior speeds of up to 7.2mbps for internet and data access and alongside this technology, the operators are offering attractive and cost friendly hotspot bundles. The coverage of this services is fairly large hence can guarantee service in most parts of the country meaning employees can still keep in touch wherever. 3G enables the business communication services instantly providing that the user has a 3G/HSPDA cell phone or a Desktop/Laptop with a broadband modem or 3G router depending on the user requirements.

b. **Fibre connections**: For many years, internet costs have been high due to the use of satellite transmission for national outbound traffic. The past few years have seen a leap towards fibre optics and now fibre has become the defacto mode of data transmission in Kenya especially with regard to backbone connectivity. There are a number of initiatives to wire the country with fibre connections both on land and sea. Private firms have put in place fibre connections between and within all the major towns and service providers are now offering home solutions on fibre, a phenomenon that has greatly improved the possibility of telecommuting.

c. **Wireless LANs/WANs**: Wireless LANs and WAN access are part of the advanced communication links that have removed physical barriers that once required employees to be in their offices to deliver service. In Kenya today, many service providers have come
up with hotspots concept whereby within given localities one can access low cost high speed communication.

d. Home-office connections. A number of some service providers today are providing Home-office connections to employees of particular companies. Such a set-up is ideal for telecommuting and is likely to be more cost effective.

iv.) Smart Phones: Today, mobile phones are smarter, more sophisticated and sport better processing power setting the stage for some highly lucrative mobile commerce applications that end users desire. For instance, Blackberry keeps users connected to people and information on the go with push-based wireless access to email, phone, text messaging, internet, organizer and other data via the GPRS network. In this way, an employee can be up to date with incoming mail without having to be at the office. Again most handheld devices can also be used as a modem to provide internet connectivity to a PC/laptop at competitive rates and reasonable data speeds. Management can thus consider to have some of the employees use these devices to support telecommuting.

v.) IP Telephony: Internet Protocol Telephony or VOIP (Voice over Internet Protocol) is the transmission of telephone calls over a data network, accomplished by packetization of the voice streams. VOIP therefore enables users to make telephone calls over a data network like the Internet. This technology greatly reduces telephone communication costs as it uses the same infrastructure for providing both Internet access (data) and Internet telephony (voice). The convergence of voice and data facilitate the implementation of such cutting edge applications as unified messaging, multimedia conferencing, collaborative contact centers, and interactive multimedia response systems. These applications help organizations realize business gains by improving operational efficiencies, increasing productivity, and enhancing both user and customer satisfaction. In this regard, an organization may consider putting in place a VoIP solution within its telecommuting infrastructure.

vi.) Messaging: When implementing a telecommuting program, ensure that there is an efficient messaging system, the primary one being email. The e-mail facilities should support typical internet messaging protocols and be accessible by browser-based clients as most users will be accessing their mailboxes via the internet. The email system thus chosen should provide integration with popular desktop applications through universal file viewers, so that files can be easily viewed, attached and transferred. The organization may also consider the capability of the mail system to deliver rich messages; content enhanced with graphics, voice, etc. Another important feature to consider when selecting a mailing system is the message security.

vii.) Groupware Functionality: In a typical organization, employees would often work in teams. Therefore when putting in place telecommuting infrastructure, the management need to incorporate a system to sustain the collaboration between the team members. These type of applications may be collectively referred to as Groupware applications and would typically
include the following features: Calendaring/scheduling; Conferencing (video/data/voice); connector services for access to legacy applications and data; contact management; document management; electronic forms design, submission and management; project management; relational database access and integration; replication facilities (for business continuity) and workflow design, implementation and monitoring. When such applications are used it is possible to have electronic workspaces for teams of people.

5.5.4.3 Information and Communication Security

Information security is characterized as the preservation of confidentiality, integrity and availability of information. Information is often the second-most valuable asset of an organization after the personnel and so data and network security is a significant issue in telecommuting especially owing to the fact that telecommuters often use public networks to access and transmit sensitive information. Many of the security controls such as passwords, software security standards etcetera also apply at home and in fact many more may have to be added. Controls and policies should be implemented to safeguard confidential information. Challenge response products, encryption products and more secure protocols have to be employed if true security is to be accomplished.

From the survey it was noted that, security has not been a major issue when it comes to IT systems among the SMEs, but with the decentralization that comes with telecommuting, it is bound to be a significant factor. In the large corporate organizations, security is very critical, especially in organization with global/multinational presence. It is the responsibility of both the managers and the employees to ensure information security and have therefore to be sufficiently sensitized and trained on information security. Before implementing a telecommuting program therefore, it is important that management address the security needs and where necessary upgrade them to cope with the risks posed by telecommuting. Other options to consider are here below discussed.

i. **Virtual Private Network (VPN):** This is an enterprise network set up on shared infrastructure and which uses the same level of security, management and efficiency policies found in private networks. This is achieved by the use of encryption and authentication of the data send over the public network. By using advanced, standards-based security protocols, an organization's data is protected from unauthorized access and misuse. Cisco VPN service has been successfully implemented in a number of organizations in Kenya. To this end, it has been known to increase productivity and flexibility for mobile users and centralized database administration, critical factors for successful telecommuting program. Furthermore there is the potential cost savings since using the Internet to distribute network services over long distances means companies no longer have to purchase expensive leased lines to various destinations.

ii. **Access Tokens:** For organizations with more emphasis on security, the security can be enhanced further by issuing access tokens to each user for purposes of accessing the intranet. One such example is the use of RACOM Cards.

iii. **Hard drive protection:** Data protection has often been cited as the reason for not allowing employees to work away from home. This can be circumvented by having each user install
hard-drive protection software such as Pointsec to ensure the integrity and confidentiality of the information stored on a computer even after the machine is stolen.

iv.) **Application Security**: Besides security provided on the network, the applications used by the organization should also provide some form of security functions such as authentication, authorization, access control, digital signatures and encryption. This will ensure that should the system be exposed, then the intruder may not be able to compromise the integrity of the contents on the network by say performing illegal transaction using the organization’s applications.

5.5.4.4 IT Support

Telecommuters are bound to encounter problems in the course of working. The problem may be at a logical level such as authentication/authorization where support may be sought from the head office IT personnel over the phone or it may be a physical on site problem that calls for immediate intervention. Common problems include PC/Workstation hardware and software cases; Network printers; Central & Local systems; Local Area Networks (LAN) & Wide Area Networks (WAN). Whatever the case, a good telecommuting program should consider having a technical support plan that enables telecommuters to access help immediately when their machine is not working. Technology today is such that system and software administrative functions are integrated with popular network monitoring and management tools thus enabling administrative functions to be accessible from any workstation, local or remote. Many organizations have a Help Desk while others have outsourced this function or even have a combination of the two. The option selected is best determined based on the nature of the organization. A few of these options are discussed here:

i.) **Self Service**: Depending on the complexity of the systems in use and the level of computer literacy of staff, it is possible that a lot of the users can solve their own problems without intervention from a technician, providing that the right infrastructure is in place. An organization may find it prudent to train its staff to do first-level diagnosis and repair before engaging technical assistance. These may also be supported by having web based guides.

ii.) **Help Desks**: Many medium and large organizations today have dedicated IT support groups, popularly known as Help Desks. This is often the single point of contact for all IT support cases, including telephony services. To support telecommuting, a help desk may be set up to support users with their IT related issues. Typically, a user may contact the help desk via any of the following ways – a user support portal, telephone, e-mail or simply walk-in service.

iii.) **Outsourcing**: This can be solved by having the service outsourced such that if an employee has a problem, he/she can get online support and if need be, a provider be charged with this responsibility and paid on a case by case basis. This has proved to be more cost effective than having many IT technicians who busy-wait for a problem to occur. In any case, many organizations today have IT specialist companies supporting their information systems with the internal person only playing a management role.
5.5 Implementation

Once the telecommuting program has been thought through and the general parameters and systems designed, it is now time to implement the program. Implementation of a Telecommuting program is a step-by-step process that requires carefully calculated activities to be taken at the opportune time to ensure smooth roll out. Such activities include production of documentation/materials, set-up, installation and testing of the selected telecommuting technology and finally launching and managing the program.

5.5.1 Implementation Strategy

The telecommuting committee needs to determine what implementation strategy will be used in rolling out the program. Here below are some options:

1. Pilot: This is where a small number of employees are enrolled on the program and closely monitored to iron out any hitches and to confirm the feasibility of the program. Once the pilot is successful, the organization can then roll out the program to the rest of the organization.

2. Phased implementation: This is where a number of telecommuters may be schedule to start telecommuting one group after the other. This may apply especially in very large organizations where dimensioning may be a big challenge if all potential telecommuters were to start all at once.

3. Large-scale Implementation: This is an all out implementation strategy where once the systems are in place and the program launched, all eligible employees start telecommuting and the rollout is managed all at once. This approach is only recommended if the expected hiccups during the roll-out are minimal and/or have limited effect to the organization's operations.

5.5.2 Stakeholder Involvement

Up until now, the telecommuting committee has been working in isolation to set the stage, involving the necessary players as need arise. But now it is time to let it out and so it is imperative that all the stakeholders, telecommuters or not, are notified and buy into the telecommuting idea. The team can also share the details of the roll-out plan and field questions that the workforce may have regarding the program. When, all the players have the same understanding of the objectives of the program and their role, the success of the roll-out is almost assured.

Aside of the telecommuters, the other major stakeholders include the IT/IS team and HR resources. These are necessary in order to:

1. Enhance the existing network/telecommunication capabilities in the organization.

2. Add state-of-the-art software and hardware. Telecommuting often comes along with the need to acquire new software and hardware to enable the employee to effectively telecommute. There include use of groupware, security access tokens and the like. The IT/IS team will need to ensure the availability and usability of such devices on the organizations Information system.
Provide thorough training for all participants and managers. The fact that users will now be relying on technology to complete their day-to-day tasks, it is imperative that they understand what tools are in place and how to use the same. As part of implementation therefore, a series of workshops and training sessions may be organized to get the users accustomed to the new tools such as groupware, secure access, minor troubleshooting, etc.

5.5.3 Preparing the Work Environment

1. Physical Security: The implementation teams check the security arrangement at the locations of work for the telecommuter(s) and upgrade the same where necessary.

2. Workspace: This is where the management assures that the telecommuter has set aside an environment that is appropriate for telecommuting. Whether the employee will be hoteling, working from home or from digital centers, the organization’s occupational health and safety requirements must be met. Among the items to check for workspace is lighting, noise levels, safety, building and structure, ventilation and temperatures, ergonomics and electrical considerations, etc. In some cases, arrangements are made to supply the telecommuter with the necessary furniture along with the necessary usage policies. Alternatively, a lump sum allowance may be paid to the user to guarantee an up-to-standard work environment.

3. Equipment: For employees to dutifully discharge their duties, they need to have all the necessary equipment and resources necessary to facilitate telecommuting. It is therefore important that the implementation team confirms the availability of all the needed equipment, infrastructure and services. Where there is a deficit, the necessary items may be procured in advance and supplied to the telecommuter-to-be. The internet services can be tested from the user’s locations and reference materials with instructions availed. The ownership and/or terms of usage of the equipment supplied have to be specified. There also need to be a policy in place for determining how utility bills and things like insurance will be handled. Typically a simple cost-sharing formula would apply.

4. Support: To ensure continuity and to adequately address the likely high number of issues that may arise at the start of the program, a properly dimensioned support team needs to be put in place to respond to any problems that may be reported. If such service is outsourced, it is important that contractual agreements are in place before commencing the program.

5.5.4 Change Management

The ultimate effect of telecommuting is that it changes the way an organization way of working, often introducing new work flows and processes. Also affected is the style of management. Naturally, some managers will resist as they feel a loss of control when their employees are not in close contact while others feel it is an extra burden having to manage people off-site. Proper training and effective communication mechanisms can be initiated in this case to not only neutralize the ‘myths’ but to also pre-empt the questions that may come up. The implementation team therefore has a task to monitor and adapt the integration as events unfold. By continuous
integrative evaluation, it will be possible to smoothly adopt the telecommuting technology and the rest of the work system.

5.5.5.5 Evaluate the Success of the Implementation

The implementation team should evaluate the program performance and then using the findings come up with potential improvements that would solve the problems and/or optimize the program.

5.6 FACTORS AFFECTING UPTAKE OF TELECOMMUTING IN KENYA

While the potential benefits of telecommuting for organizations are not in doubt, a number of factors emerge as impediments to the uptake of telecommuting in organizations in Kenya. In the section we look at these challenges and the possible ways of going round them in order that telecommuting may be a reality rather than a myth.

5.6.1 Poor ICT Infrastructure

For a developing country like Kenya with a very low tele-density, the infrastructure available to support full fledged telecommuting is insufficient or simply not available all together. In the survey, it came out clearly that the bandwidth available in the market at the moment is not enough to support bandwidth-intensive applications such as video and teleconferencing. In this regards, it is worth noting that, there have been various initiatives by both the government and private sector to alleviate this in the recent past. Fibre optic networks are being rolled out to residential areas, within the major towns and also undersea cables have been put in place to substitute the high latency and costly satellite technology currently used to connect country to the backbone. This will result in much higher speeds at affordable tariffs which will in turn support the telecommuting programs. Again the GSM operators are today rolling out 3G services that have fairly high speeds for data communication using modems.

Again at organizational levels, most organizations have insufficient Server Processing Power and Access Ports necessary to support telecommuting as most organizations in Kenya today are dimensioned for on-site IT systems with limited out-bound connections, often only to their respective Internet Service Providers (ISPs). The roll-out of telecommuting has therefore had cost implications to the organizations in terms of investing in more powerful servers and higher numbers of access ports to support the telecommuters.

5.6.2 Costs

The initial cost of starting a telecommuting program is often too high for the budgets of the company especially as regards the acquisition of the required ICT infrastructure. The cost of bandwidth in Kenya is known to be exorbitant, aggravated especially by the fact that the country relies on satellite connection to the backbone. In as much as the prices of computing hardware and software are decreasing, the need for more powerful servers, more office equipment such as printers that would otherwise be shared, all add up to a huge bill to the organizations budget. The rapid advancement of technology puts many of these items in the obsolete brackets calling for
replacement and when this is done on large scale, the costs are significant. Again telecommuting means more telephone lines have to be acquired for each employee and this is likely to increase the communication bills as cost control measures may not be as effective in a telecommuting environment. This has resulted in the telecommuting programs being suspended due to their impact on the organization finances. It however helps to note that the benefits associated telecommuting, even though not easy to fully quantify in terms of money, far outweighs the initial investment. In Kenya, the government has liberalized the telecommunication sector, bringing in more players to end the era of monopolies and these has created competition that has consequently resulted in lower tariffs. This is set to further reduce as more cost effective transmission systems in the name of undersea fibre cables are rolled out.

5.6.3 Culture and Attitudes
Culture, organizational or corporate, remains a challenge to telecommuting affecting managers and employees alike. Managers who are used to managing by walking around may not be comfortable with the telecommuting approach. Telecommuters’ work must be evaluated by measurable standards such as ability to meet project objectives and deadlines and produce work that meets certain quality standards. In this regard, the telecommuting program must be accompanied by a performance management system that takes into account particular KPIs for the telecommuter and measurable by e-mails, faxes, reports and face-to-face meetings for feedback.

The employees on the other hand may fear being side-lined or isolated for choice assignments, training opportunities, or promotions and therefore prove counterproductive to the objectives of the program. The supervisors and management should address such issues frequently to diffuse any tensions by say organizing regular face-to-face meetings.

5.6.4 Insufficient Skills
The implementation of telecommuting program may require the scarce, expensive consultants and specialists to get it going. Also the workforce needs to have a certain level of competence especially as regards technical expertise and computer literacy to be able to exploit the ICTs for a productive telecommuting experience. The ongoing maintenance and user training takes longer and costs more than vendors acknowledge. The innovation of application features and functionality is running faster than organization’s and end users can absorb, understand and deploy profitably. These factors together make it difficult to successfully implement telecommuting programs causing many organizations to stick to the traditional daily commute way of working.

5.6.5 Threat to Information Security
The security and integrity of the organization’s information at the employees residence is always of concern. This is especially so where the management doubts the loyalty of its workforce in the face of competition. The organization can mitigate this by having an audit system in place to put in place checks and balances to guarantee data security. Such an audit may even be done as part of the screening procedures before an employee is put on the telecommuting program. Further the
management may run some sort of ethics and code of business conduct program where employees are made aware of their obligation and commit to maintain confidentiality.

5.7 COST BENEFIT ANALYSIS

5.7.1 Productivity

Ability to utilize resources beyond geographic boundaries; work beyond eight hours without increase in labour costs; business continuity when contingencies occur such as the Post Election Violence in Kenya. In America, the percentage of telecommuters shot up following the 9-11 terrorist attacks.

5.7.2 Environmental Impact

With each organization focusing on ways of cutting their own impact on the environment, telecommuting would shape a less carbon-intensive way of life through reduced travel. From the results obtained, it is shown that majority of the respondents use personal cars to get to work. This creates a huge amount of carbon emissions that consequently impacts on the environment. Telecommuting would therefore be a sure way to reduce the number of trips that need to be made per employee. This will in effect bring down the amount of carbon emissions thereby contributing to the global drive to save the environment from global warming.

5.7.3 Support for Work-Life Balance

From the human resource perspective, the challenges of enabling employees attend to family matters adequately without exhausting their allocated leave days is very common. And where there is strict monitoring, the performance of employees with family/personal issues at the back of their mind has been wanting. It is also questionable how much of the time an employee at the workplace dedicates to work-related matters. It is indeed no surprise that some employees use company resources and time to complete personal errands.

Again, there have been campaigns to have organization respond positively to the personal engagements of their employees. Through, telecommuting, the employees will be in a position to effectively take care of their personal errands once in a while and be able to make up for lost time by working at odd hours. In fact, previous studies have shown that telecommuters actually tend to put in more hours than office going employees. This is attributed to the fact that in the comfort of their home, the employees are not worried about how they will get home, of what is going on at home etc.

5.7.4 Real Estate Savings

Because rent and operating costs constitute a significant portion of many companies' annual expenditures, the opportunity that telecommuting presents for trimming down physical space requirements is worth exploring. The potential savings generated by eliminating one average 8x8
cubicle plus one downtown parking space has been estimated at more than $2000 per employee per year.

5.7.5 Reduced Travel Costs

Traffic jams are not only the individual commuter’s problem. U.S. companies stand to lose up to 56 million work weeks this year, worth approximately $26 billion, if only half of the 108 million employees who drive to work are held up just 10 minutes each day in traffic.

5.8 CONCLUSIONS AND RECOMMENDATIONS

This survey project has been largely successful with all the answers to the research questions established. Through the investigations conducted, it is clear that telecommunication is a great opportunity waiting to happen. The trend in the telecommunication infrastructure where by it is becoming more adequate and cheaper will only serve to entrench telecommuting technology in the contemporary way of working.

In terms of the extent to which telecommunication has been implemented in Kenya, it was observed that even though many organizations have the ability to implement the telecommuting programs, indeed very few have such an arrangement on a formal basis. Majority of the organizations have only a semblance of telecommuting - where in some organizations, the employees occasionally chooses to work from their homes while other organizations flexible work programs where the employee chooses what time of the day he/she will be at work. In both cases the telecommuter does not eliminate the unnecessary daily commute hence the true benefits of telecommuting are not realized.

Again the concept of telecommuting technology as a whole is yet to be appreciated and hence there is need to sensitize the government and private sector on the benefits of this approach. It is worth noting that there are several factors that would drive organizations towards telecommuting including: the rising cost of fuel; the environmental effects of carbon emissions; the sharp increase in urban population versus the availability of resources to sustain such a population such as water and sewerage, roads, etc; and the ever decreasing cost of bandwidth and projected plummeting drop expected with the completion of the NOFBI and TEAMs projects.

On the question if the viability of telecommuting in Kenya, there was general a conditional agreement that telecommuting is viable. This was however on condition that the required infrastructure is in place.

The benefits of telecommuting were numerous. As organization grapple with the ever diminishing office space, skyrocketing rent charges and more congested roads, telecommuting will be the logical solution.

Further today the world economies are exploring more ways to cut carbon emissions in a bid to slow the looming disaster of global warming. Supporting organizations, many of whom are large corporate companies, have taken a lead in introducing telecommuting in their organizations as a contribution towards this worthy cause.
With globalization defining the world economies, staff retention and access to the right is becoming more and more a major factor in ensuring the continued survival of organizations. Telecommuting serves to retain staff that may otherwise leave for reasons such as spousal transfers while also enabling organizations to recruit qualified resources irrespective of geographical constraints.

Furthermore, with the political situation of today's society and incidences of natural calamities, the need for business continuity has never been more. Telecommuting is one way to ensure work continues if say the city is inaccessible due to political unrest, flooding, bad weather or any other geographical limitation that may arise.

These and many other benefits are what makes telecommuting the way to go and the sooner the government and private sector exploit this avenue, the better the results will be and most likely, Kenya will improve its standing on the Networked Readiness index.

While the aforementioned potential benefits are not in question, there are major challenges that will have to be overcome. The first in this list is that if infrastructure in terms of availability and cost. Secondly, the issue of culture and attitudes play a major role in success of the program. This involves managers accepting the new styles of management and employees embracing the culture of delivering work and not hours to their employers.

The strategies necessary for implementation of telecommuting were extensively covered in the model described in this chapter. This model may serve as a guide for an organization that would like to implement the program.

The government and/or its agencies may also take the leading role in promoting the use of telecommuting technology through say tax incentives and duty waivers. Besides creating an enabling environment as it is doing through the public and private partnerships, the government can also develop relevant policies that would promote telecommuting and enable the country to tap into the various benefits obtainable from such programs. In fact the ICT Policy of Kenya acknowledges that the broad challenge today is to harness the potential of ICTs for economic growth and poverty reduction. Specific challenges include lack of a comprehensive policy and regulatory framework, inadequate infrastructure, and insufficient skilled human resources (Ministry of Information and Communication, 2006).

In this regard, Telecommuting stands to be counted as a major innovation that can go a long way in unleashing the potential that is in ICTs thereby enhance socio-economic development in Kenya today. As envisaged in the policy, the challenge remains insufficient infrastructure, lack of appropriate legislation and insufficient skilled human resources. This framework may be considered as one of the baby-steps towards realization of socio-economic development.

### 5.8.1 Challenges during the survey

The following were the challenges encountered in the course of carrying out this survey project.

i.) There was little reference material about the topic with reference to the developing countries or Kenya for that matter.
There was poor response to the survey questionnaires by a majority of the respondents some citing the fact that they did not understand the concept of telecommuting.

Reluctance to participation in interviews especially by service providers fearing that information would leak to competition.

Lack of appropriate channel to return the questionnaires as many no longer use the post office nor do they want to hand deliver.

There was no possibility of counter checking the responses given by some respondents.

Where some questionnaires were not answered correctly, there was a reluctance and a times refusal to fill the questionnaire again.

On the part of the researcher, it was difficult to ensure continuity with a lot of interference from the place of work perspective.

5.8.2 Recommendations for Further Study

Telecommuting is a wide topic that touches on many aspects of society including transport systems, human resource management, ICTs etc. More studies are therefore necessary in order to get a full picture of the impact of telecommuting on these facets of life. Such studies may include;

i.) Taking this model and testing it in a live environment. By so doing, this model can be improved and published to other organizations to catalyze the rollout of telecommuting. Also the performance of telecommuting technology can then be measured.

ii.) A full study of work related travel by the working population to establish just how much of this traffic can be avoided if telecommuting were introduced. This will help get a more realistic view of how much we can save not only in terms of fuel and time, but also in terms of carbon emissions and hence the impact on the environment.

iii.) Developing a system that would be able to establish the readiness of an organization to roll-out a telecommuting program successfully.

5.8.3 Recommendations for Policy and Practice

As observed in this research, there is limited documented research that has been carried out on the topic of telecommuting. A lot of resources and time are required to be able to carry out meaningful research on telecommuting especially given that some of the aspects are not directly measurable. In this regard, it would be prudent for research institutions such as the universities to set aside funds for further research in this area. A practical proposal is where the Research for Grants on ICT for Development would sponsor some Masters and/or PhD students to carry out research on Telecommuting. The fact that telecommuting is greatly influenced by ICTs and has impact on the socio-economic development at the individual, community and national levels qualifies it for such funding. Thus going forward, the program should include telecommuting among the eligible fields of study and go a step further to sponsor students to carry out further research in this area.

The telecommuting model proposed herein has not been subjected to real life environment and this is a research opportunity that can be explored to test the viability of this model and propose further
improvement and ultimately contribute to the quality of the body of knowledge about telecommuting in Kenya.
APPENDICES

APPENDIX A: REFERENCES AND BIBLIOGRAPHY


APPENDIX B: SAMPLE DOCUMENTS FOR THE SURVEY

Letter of Introduction from University of Nairobi

UNIVERSITY OF NAIROBI
SCHOOL OF COMPUTING AND INFORMATICS

TO WHOM IT MAY CONCERN

RE: MARTIN M. M. ANAMI - P56/PS/7549/2005

This is to confirm that Mr. Martin M. M. Anami of P.O Box 7992 -00200 Nairobi is a student at the University of Nairobi in the School of Computing and Informatics, pursuing a Master of Science in Information Systems Degree. As part of the program he is required to carry out a project. In this regard he is undertaking a project entitled "A model of Telecommunicating in Kenya".

The purpose of writing is to request you to accord him the necessary assistance he may require to facilitate completion of his project. In case of clarification, kindly refer to the undersigned.

Yours Sincerely

Dr. Elijah Omwenga
SUPERVISOR
November 2008

Dear Sir/Madam,

RE: INVITATION TO PARTICIPATE IN A SURVEY

I hereby invite you to participate in my survey on Telecommuting: A Model and Readiness Index for Telecommuting in Kenya. The research project is part fulfillment of requirements for the Master of Science in Information Systems (MIS) at the University of Nairobi. In this survey, approximately 100 people will be asked to complete a survey that asks questions about working at home. The questionnaire will take approximately 15 minutes to complete.

Inasmuch as it is very important for me to learn your opinions, your participation in this study is completely voluntary. However, if you feel uncomfortable answering any questions, you can skip it or withdraw from the survey at any point. In order that your feedback is helpful to the survey, be certain to consider each question thoughtfully and honestly.

Your responses will be strictly confidential and data from this research will be reported only in the aggregate. All information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact the undersigned by phone, SMS or email.

Thank you very much for your time and support. Enclosed please find the questionnaire. Upon completion, kindly alert me and I will arrange to collect it or drop it off at any of the addresses specified therein.

Yours sincerely,

Martin Anami
P.O. Box 7992-00200
City-Square, Nairobi.
Tel: 0722-916624
E-mail: martinanami@yahoo.com
Sample Questionnaire

Survey to Establish a Model and a Readiness Index for Telecommuting in Kenya

SELF-ADMINISTERED QUESTIONNAIRE
Name (optional) ........................................................................... Organization (optional) .........................................................

INSTRUCTIONS
1. Please complete this questionnaire, considering each question thoughtfully and honestly.
2. Your responses will be strictly confidential and data from this research will be reported only in the aggregate. All information will be used only for the purpose of this study.
3. Once complete, please e-mail the questionnaire to martinanami@yahoo.com.
4. Alternatively, the completed questionnaire may be returned through any of the following ways:
   • Post it back to Martin Anami, P.O Box 7992-00200 City-Square, Nairobi or
   • Drop it off at the EKL reception on 4th floor Eden Square, Chiromo Rd Westlands
   • Call/SMS 0722-916624 and have it collected at a place of your convenience or

Should you have any questions related to this survey, please direct them to Martin M. M. Anami, of P.O. Box 7992-00200, Nairobi, Kenya, Tel: +254722916624 or Email: martinanami@yahoo.com.

Introduction:
Telecommuting, otherwise referred to as teleworking, may be defined as an alternative work arrangement for employees to conduct all or some of their work away from the primary workplace. In other words, the daily physical commute to a central place of work is replaced, in part or whole, by telecommunication links.

PROFILE
1. What is your gender?
   □ Male □ Female

2. What highest level of education have you attained?
   □ High School □ Post Graduate
   □ College □ Other (Specify) ....................
   □ Graduate

3. Do you hold a management job?
   □ Yes □ No

4. What best describes your occupation?
   □ Administration □ Customer service
   □ Accounting □ Human Resource
   □ IT □ Medical (Dr/Nurse)
   □ Production □ Lawyer
   □ Engineering □ Sales
   □ Logistics □ Other (Specify) ....................

5. What best describes your type of business
   □ Transportation □ Education
   □ Banking □ Insurance
   □ IT □ Utility (Power, Water)
   □ Manufacturing □ Hospitality/Medical
   □ Retail Store □ Telecommunication
   □ ISP □ Advertising/Promotion
   □ Professional Services (e.g. Legal) □ Other (Specify) ....................

6. Approximately how many employees are in your organization?
   □ 1 - 10 □ 10 – 25
   □ 25 – 50 □ 51 or more
7. How do you mostly communicate and coordinate work with your colleagues, managers and/or subordinates?
- Oral
- E-mail
- Phone
- Memos
- Physical Work Orders
- Other (Specify)

8. What best describes face-to-face interaction with your colleagues?
- An important part of completing my tasks
- Only somewhat important for me
- Not necessary for my work

9. On a daily basis, how often do you work out of the office premises?
- Always
- Occasionally
- Most of the time
- Never

10. In your work process, how often do you use computer facilities?
- Always
- Occasionally
- Most of the time
- Never

11. Which of the following best describes your interaction with computers?
- Confident. I can run applications, download and upload files, install/configure software, and do minor troubleshooting.
- OK. I can use word processing software, and generally manage files.
- Uncomfortable. I have little experience using computers.

12. Are you currently in a job that can allow you to work at home during office hours?
- Yes
- No
- Not sure

13. Do you ever take work home with you?
- Yes
- No
- Not sure

14. If yes, how many days in a week do you take work home?
- 1
- 2
- 3
- 4
- 5 or more
- N/A

15. Does your current employer offer an opportunity for you to work from home?
- Yes
- No
- Not sure

(If you answered Yes to the previous question. Please skip to question 17)

16. If not, and you were given the opportunity, would you work from home?
- Yes
- No
- Not sure

17. How many days a week do you/would you like to work at home?
- N/A
- 1
- 2
- 3
- 4
- 5

18. Would you finish your work in time if you were to work from home?
- Yes
- No
- Not sure

19. Please indicate which, if any, of the following office equipment/services/software you require to enable you to work at home. (Choose all that apply)
- Computer
- Printer
- Copy machine
- Fax machine
- Modem (for internet)
- Microsoft Office
- Telephone
- Other (Specify)

20. In your opinion, what would be the main reason why telecommuting may not be implemented in your organization?
- Lack of adequate communication network to support it

68
The nature of your work does not allow
The need for management to supervise staff
Lack of appropriate computerized systems necessary to enable work from home
The costs associated with telecommuting e.g. computers, printers, phone bills
Do not know

TRANSPORTATION

21. Please indicate how many days a week you use the following modes of transport to work

<table>
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<tr>
<th>Mode of Transport</th>
<th>0</th>
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<th>4</th>
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<td>b. Car pool/Get a lift</td>
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<td>c. Take public transport</td>
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<td>d. Ride a bicycle</td>
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<td>e. Walk</td>
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<td>f. Other</td>
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22. How many kilometers (approx.) do you travel to get to work (one way)?
- □ 1 - 5
- □ 6 - 15
- □ 16 - 30
- □ 31 or more

23. How long does it take you to get to your place of work on average (one way)?
- □ Less than 30 min
- □ 1 - 1 ½ hours
- □ 30min – 1 hour
- □ More than 1 ½ hours

24. Approximately how much do you spend per month to get to work as in fares and/or fuel expenses that would otherwise be saved if you worked from home?
- □ Less than Kshs. 1,000
- □ Kshs. 1,000 - 2,500
- □ Kshs. 2,500 - 5,000
- □ Kshs. 5,000 - 7,500
- □ Kshs. 7,500 - 10,000
- □ Over Kshs. 10,000

(If you do not telecommute you may skip to question 29)

TELECOMMUTING ASSESSMENT

25. Please choose the statement that best describes the changes the Employer has seen with your Productivity and Quality of Work, since you started Telecommuting. (If not sure of answer continue to next question).
- □ Excellent
- □ Good
- □ Average
- □ Below Average
- □ Poor

26. What are the greatest benefits that you have realized from Telecommuting so far? (Check all that apply)
- □ Less Absenteeism
- □ Less distraction from work
- □ Higher productivity
- □ More flexible work schedule
- □ Less commuting
- □ More control over your life
- □ More time to spend with family
- □ My employer benefits from extra work time
- □ Reduced Stress
- □ Reduced costs (travel, lunches, clothes)
- □ Reduced employee turnover
- □ No benefits realized
- □ Other (specify)...

27. Please choose the answer that best describes this statement, "My life has improved since I started Telecommuting".
- □ Excellent
- □ Good
- □ Average
- □ Below Average
- □ Poor

28. Do you agree that Telecommuting has helped you spend more time with your family?
- □ Strongly Agree
- □ Agree
- □ Neutral
- □ Disagree
- □ Strongly Disagree

29. What is your overall opinion of Telecommuting?
- □ Excellent
- □ Good
- □ Average
- □ Below Average
- □ Poor
MANAGEMENT

30. Which of the following closely describes the style of management used at your organization?
   □ Management by results approach  □ Management by supervision
   □ Not sure

31. How often do you hold meetings with your subordinates/Co-workers/Superiors?
   □ Daily  □ Weekly
   □ Monthly  □ Quarterly or less frequently

32. I can trust my employees/coworkers to get the work done, even if I/the manager cannot see them doing it.
   □ Strongly Agree  □ Agree  □ Neutral  □ Disagree  □ Strongly Disagree

33. I feel it is important for a manager to help employees achieve a balance between their professional and personal responsibilities.
   □ Strongly Agree  □ Agree  □ Neutral  □ Disagree  □ Strongly Disagree

34. The company is able to facilitate and provide support to employees to enable them work from home.
   □ Strongly Agree  □ Agree  □ Neutral  □ Disagree  □ Strongly Disagree

35. To what extent are/would the following factors be a challenge to telecommuting in your organization?

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Great extent</th>
<th>Somewhat great extent</th>
<th>Neutral</th>
<th>Minimal extent</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Equipping telecommuters to connect with office resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b. Reorganization work to enable it to be done outside of the office</td>
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<tr>
<td>c. Changing the management approach to enable effective supervision</td>
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<tr>
<td>d. Getting the necessary technological platform to support telecommuting</td>
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</tr>
<tr>
<td>e. Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

36. In this department, people are open to part-time work, job sharing, and other flexible work arrangements.
   □ Strongly Agree  □ Agree  □ Neutral  □ Disagree  □ Strongly Disagree

37. In your opinion, would you support the idea of people working from their homes?
   □ Yes  □ No  □ Not sure

Thank You very much for your Time and Participation!

If you have any suggestions to make this survey more relevant, please get in touch with the below mentioned

Martin M. M. Anami
P.O Box 7992-00200
Nairobi, Kenya
Tel: +254722916624
Email: martinanami@yahoo.com.
August 2008

Dear Sir/Madam,

RE: INVITATION TO AN INTERVIEW

I hereby invite you to participate in an interview for a survey on Telecommuting titled: A Model and Readiness Index for Telecommuting in Kenya. The research project is part fulfillment of requirements for the Master of Science in Information Systems (MIS) at the University of Nairobi. The survey involves interviews with several stakeholders of whom you've been selected to be part. Inasmuch as it is very important for me to learn your opinions, your participation in this study is completely voluntary. Your responses will be strictly confidential and data from this research will be reported only in the aggregate. All information will be coded and will remain confidential.

I am therefore writing to request your audience and participation in this interview at a time and place of your convenience. Thanking you in advance for your time and support.

Enclosed please find samples of the questions you are likely to asked in the interview.

Yours sincerely,

Martin Anami
Tel: 0722-916624
E-mail: martinanami@yahoo.com
Sample Interview Questions and Template

TELECOMMUTING

Interviewee: Date of interview:
Position in Organization: Interviewer
Organization: Place of Interview
Interviewee Category: Duration of Interview:

NOTE: The responses from this interview will be strictly confidential and the data will be reported only in the aggregate. All information will be used only for the purpose of this study.

Introduction:
Telecommuting is otherwise referred to as teleworking, may be defined as an alternative work arrangement for employees to conduct all or some of their work away from the primary workplace. In other words, the daily physical commute to a central place of work is replaced, in part or whole, by telecommunication links.

General Questions

1. What is the most common mode of communication used to coordinate work between colleagues, managers and/or subordinates in your organization?
   □ Oral □ Phone □ Physical Work Orders
   □ E-mail □ Memos □ Other (Specify) ..........

2. How important is face-to-face communication among staff in your organization?

3. Have you ever been able to work from home?
   3a. If Yes, what was different when working from home than working at the office?
   3b. If No, if you were given the opportunity, would you consider/recommend working from home?

4. What is your typical mode of transport to work?
   □ Drive □ Take public transport □ Walk
   □ Car pool/Get a lift □ Ride a bicycle □ Other.................

5. How many kilometers (approx.) do you travel to get to work (one way)?

6. How long does it take you to get to your place of work on average (one way)?

7. Approximately how much do you spend per month to get to work as in fares and/or fuel expenses that would otherwise be saved if you worked from home?

8. How often do you hold meetings with your subordinates/Co-workers/Superiors?
   □ Daily □ Weekly
   □ Monthly □ Quarterly or less frequently
MAIN QUESTIONS

Q:

Q:

Q:

Q:

Q:

Q:

Q:

Q:

INTERVIEWER COMMENTS:
APPENDIX C: EXAMPLES OF TELECOMMUTING DOCUMENTS

Telecommuting Site Checklist

This checklist should be completed during a site visit to the employee’s proposed home office. The adequacy of the work space must be determined between you and the employee. The success of the telecommuting arrangement depends on the assessment of the work space and the ability of the employee to successfully complete the required work in this environment. If the work space is not adequate, the telecommuting agreement will not work.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the space seem adequately ventilated?</td>
<td></td>
</tr>
<tr>
<td>2. Is the space reasonably quiet?</td>
<td></td>
</tr>
<tr>
<td>3. Are all stairs with 4 or more steps equipped with handrails?</td>
<td></td>
</tr>
<tr>
<td>4. Are all circuit breakers and/or fuses in the electrical panel labeled as to intended service?</td>
<td></td>
</tr>
<tr>
<td>5. Do circuit breakers clearly indicate if they are in open or closed position?</td>
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</tr>
<tr>
<td>6. Is all electrical equipment free of recognized hazards that would cause physical harm (frayed wires, bare conductors, loose wires, flexible wires running through walls, exposed wires fixed to the ceiling)?</td>
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</tr>
<tr>
<td>7. Are electrical outlets 3 pronged (grounded)?</td>
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</tr>
<tr>
<td>8. Are aisles, doorways, and corners free of obstructions to permit visibility and movement?</td>
<td></td>
</tr>
<tr>
<td>9. Are file cabinets and storage closets arranged so drawers and doors do not open into walkways?</td>
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</tr>
<tr>
<td>10. Do chairs appear sturdy?</td>
<td></td>
</tr>
<tr>
<td>11. Is the space crowded with furniture?</td>
<td></td>
</tr>
<tr>
<td>12. Are the phone lines, electrical cords, and extension wires secured under a desk or alongside a baseboard?</td>
<td></td>
</tr>
<tr>
<td>13. Is the office space neat and clean?</td>
<td></td>
</tr>
<tr>
<td>14. Are floor surfaces clean, dry, level, and free of worn or frayed seams?</td>
<td></td>
</tr>
<tr>
<td>15. Are carpets well secured to the floor and free of frayed or worn seams?</td>
<td></td>
</tr>
<tr>
<td>16. Is there a fire extinguisher in the home, easily accessible from the office space (required)?</td>
<td></td>
</tr>
<tr>
<td>17. Is there a working (test) smoke detector within hearing distance of the work space (required)?</td>
<td></td>
</tr>
<tr>
<td>18. The employee agrees to arrange for an energy audit of the home by the local utility company and fire safety inspection by the local fire department within 30 days of the signing of this agreement, provided they can be accomplished free of charge.</td>
<td></td>
</tr>
<tr>
<td>19. We agree that in our opinion this is an acceptable home office space that allows the employee a reasonable opportunity to meet the job requirements as a telecommuter.</td>
<td></td>
</tr>
</tbody>
</table>

Comments (optional):
Site Inspected by: ________________________________________________

Date: __________________________________________________________
Telecommuting Agreement

The following constitutes an agreement between [Your Business] and [Employee].

[Employee] agrees to participate in the telecommuting program and to adhere to the applicable guidelines and policies. [Your Business] concurs with the employee's participation and agrees to adhere to the applicable guidelines and policies.

Terms and conditions. The telecommuting agreement is subject to the following terms and conditions:

Duration. This agreement will be valid for a period of [specify term] beginning on [start date] and ending on [end date]. At the end of that time, both parties will participate in a review which can result in the reactivation of the agreement.

Work hours. Employee's work hours and work location are specified in the Attachment at the end of this agreement.

Pay and attendance. All pay, leave and travel entitlement will be based on the employee's primary business location. Employee's time and attendance will be recorded as performing official duties at the primary business location.

Leave. Employees must obtain approval before taking leave in accordance with established office procedures. By signing this form, employee agrees to follow established procedures for requesting and obtaining approval of leave.

Overtime. The employee will continue to work in pay status while working at the home office. An employee who works overtime that has been ordered and approved in advance will be compensated in accordance with applicable law and rules. The employee understands that [Your Business] will not accept the results of unapproved overtime work and will act vigorously to discourage it.

By signing this agreement, the employee agrees that failing to obtain proper approval for overtime work may result in removal from the telecommuting program or other appropriate action.

Business owned equipment. In order to effectively perform their assigned tasks, employees may use [Your Business] equipment at the telecommuting location with the approval of [Your Business]. The equipment must be protected against damage and unauthorized use. [Your Business] owned equipment will be serviced and maintained by [Your Business]. Any equipment provided by the employee will be at no cost to [Your Business], and will be maintained by the employee.

Inspection. The telecommuting location will be inspected periodically to ensure that proper maintenance of [Your Business] equipment is performed, and that safety standards are met. Notice must be given to the employee at least 24 hours in advance of the inspection, which must occur during normal working hours.

Liability. [Your Business] will not be liable for damages to the employees' property that result from participation in the telecommuting program.

Reimbursement. [Your Business] will not be responsible for operating costs, home
maintenance, or any other incidental cost (e.g., utilities) whatsoever, associated with the use of the employee's residence. The employee does not relinquish any entitlement to reimbursement for authorized expenses incurred while conducting business for [Your Business].

**Workers' Compensation.** The employee is covered under the Workers' Compensation Law if injured in the course of performing official duties at the telecommuting location.

**Work assignments.** The employee will meet with [designate contact person] to receive assignments and to review completed work as necessary or appropriate. The employee will complete all assigned work according to work procedures mutually agreed upon by the employee and [the contact person] according to guidelines and standards stated in the employee's performance plan.

**Employee evaluation.** The evaluation of the employee's job performance will be based on norms or other criteria derived from past performance and occupational standards consistent with these guidelines. For those assignments without precedent or without standards, regular and required progress reporting by the employee will be used to rate job performance and establish standards. The employee's most recent performance appraisal must indicate fully achieved standards.

**Records.** The employee will apply approved safeguards to protect [Your Business] records from unauthorized disclosure or damage. Work done at the telecommuting location is considered [Your Business] business. All records, papers, computer files, and correspondence must be safeguarded for their return to the primary business location.

**Curtailment of the agreement.** [Specify whether the employee may continue working for your business if the employee no longer wishes to telecommute. Also specify the circumstances under which the telecommuting agreement will be terminated by your business (e.g., if continued participation fails to satisfy business needs) and the consequences of that termination on the worker's continued employment.]

**Performance location.** The employee agrees to limit performance of assigned duties to the primary business location or to the approved home location. Failure to comply with this provision may result in termination of the telecommuting agreement and/or other appropriate disciplinary action.

Employee: ___________________________ Date: ________________

[Contact person]: _______________________ Date: ________________

**Attachment**

The following hours and locations are agreed to in support of the Telecommuting Agreement.

Primary Business Location: ________________________________
<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
<th>Location (home, office, other)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td><em><strong><strong>-</strong></strong></em></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td><em><strong><strong>-</strong></strong></em></td>
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<td>Wednesday</td>
<td><em><strong><strong>-</strong></strong></em></td>
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<td>Thursday</td>
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<td>Friday</td>
<td><em><strong><strong>-</strong></strong></em></td>
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<tr>
<td>Saturday</td>
<td><em><strong><strong>-</strong></strong></em></td>
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</tr>
<tr>
<td>Sunday</td>
<td><em><strong><strong>-</strong></strong></em></td>
<td></td>
</tr>
</tbody>
</table>

Comments (Schedule flexibility, etc.):

__________________________________________________

__________________________________________________

__________________________________________________

__________________________________________________

__________________________________________________

__________________________________________________

Signatures:

[Your Name]: ___________________________ Date: ______

Employee: ___________________________ Date: ______

Employee Information:

Name: _______________________________________

Address: _____________________________________

City, State and Zip: ___________________________________
Telecommuting Program Evaluation

Date:
Employee:
Manager:
Telecommuting Manager:

Instructions

Please answer all questions using a scale of 1 (strongly disagree) to 5 (strongly agree). In order to help make the program stronger, please be as candid as possible.

The Program

1. The goals and objectives of the program were clearly defined. 1 2 3 4 5
2. I felt supported in this program by my manager. 1 2 3 4 5
3. The structure of the program made it easy to perform my role. 1 2 3 4 5
4. The program requirements were just right. 1 2 3 4 5
5. The time commitment for each part of the program was just right. 1 2 3 4 5
6. The match between my mentoring partner and I worked. 1 2 3 4 5
7. I believe the program will benefit the organization. 1 2 3 4 5
8. The overall expected outcomes for the program were realistic. 1 2 3 4 5
9. The program worked for me. 1 2 3 4 5

The Relationship with the Mentor

1. The match between my mentoring partner and I met my needs. 1 2 3 4 5
2. We have met regularly. 1 2 3 4 5
3. We came prepared to use the time effectively. 1 2 3 4 5
4. We were confident about what to do when we started. 1 2 3 4 5
5. My mentor understood what I was saying. 1 2 3 4 5
6. My protege/mentee understood what I was saying. 1 2 3 4 5
7. I experienced learning and growth during the process. 1 2 3 4 5
8. We were open and honest with each other. 1 2 3 4 5
9. We had meaningful conversations. 1 2 3 4 5
10. My mentor offered guidance and knowledge. 1 2 3 4 5
11. My mentor could be called a "developer of people." 1 2 3 4 5
12. My mentor shared concerns and asked good questions. 1 2 3 4 5
13. My mentor enlightened me. 1 2 3 4 5
14. This relationship will continue beyond the formal process. 1 2 3 4 5

Benefits and Lessons Learnt

1. As a result of the program:
   I have grown. 1 2 3 4 5
I feel better about my career.  
1 2 3 4 5  
I feel more concerned about my career.  
1 2 3 4 5  
I feel more a part of the organization.  
1 2 3 4 5  
I feel it was worth my time and effort.  
1 2 3 4 5  

2. The rules for success, both unwritten and written, were explored and considered.  
1 2 3 4 5  
3. Developmental areas were defined and recommendations made.  
1 2 3 4 5  
4. This experience increased my effectiveness.  
1 2 3 4 5  

**General Questions**

What has been the greatest benefit you received from this experience?  

What were the greatest challenges?  

What conversations still need to take place?  

Please provide specifics about the mentoring relationship:  

Strengths -  

Weaknesses -  

Recommendations -  

Please provide specifics about the program:  

Strengths -  

Weaknesses -  

Recommendations -