ACCESS TO AND USE OF INFORMATION IN MUKURU AND KANGUNDO DIGITAL VILLAGES, KENYA

BY

BARON SILAS

A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Science in Library and Information Studies, School of Information Sciences, Department of Library, Records Management and Information Studies

MOI UNIVERSITY
ELDORET

2018

DECLARATION

DECLARATION BY THE CANDIDATE:

This thesis is my original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior permission of the author.

---------- ----------

BARON SILAS DATE

IS/MPHIL/054/2011

DECLARATION BY THE SUPERVISORS:

This thesis has been submitted with our approval as University supervisors.

---------- ----------

Prof. Joseph Kiplang'at DATE

Technical University of Kenya

---------- ----------

Dr. Damaris Odero DATE

Department of Library, Records Management

and Information Studies

Moi University

DEDICATION

This work is dedicated to my family. Thank you for your support, encouragements, love and understanding.

ACKNOWLEDGEMENTS

I would like to thank the almighty God for having given me the opportunity and strength to finish this research. I am especially grateful to my family, particularly to my dear wife Christine Tamnai for giving me the necessary social and emotional support that I needed to carry this study, my grateful thanks to the Ministry of Sports, Culture and the Arts, specifically the department of Kenya National Archives and Documentation Service for funding my study.

I am heavily indebted to my supervisor Dr. Damaris Odero for her guidance, advice and helpful comments that made it possible for me to finish this research. Special thanks also go to Prof. Joseph Kiplang'at for his invaluable advice and comments without which this research could not have been possible.

Finally, I would like to thank everyone who has supported me in completing this research report. May God Bless you all

ABSTRACT

The Kenya government, in its quest to increase access to Information and Communication Technologies (ICTs) and ensure that rural communities have access to information, have come up with Digital Villages Project (DVP) in partnership with other stakeholders. Whilst the motive behind the DVP is to increase information accessibility there is little to show that the same has been achieved. Accordingly, this study investigated access to and use of information by local communities in Mukuru and Kangundo digital villages. The study sought to determine the information needs of the local communities, establish the factors influencing the choice of information source, find out the extent to which Mukuru and Kangundo digital villages are used by the communities to access information and examine the factors affecting the use and access of information in Mukuru and Kangundo digital villages. The study was informed by information chain model whose key elements: local content, economic resources, social resources and action resources formed the basis for the research. The study was guided by qualitative research approach with purposive sampling technique being used to identify the two digital villages and the respondents under the study. Data was collected from a sample size of 50 respondents consisting of 2 managers of the digital villages, 7 staff members, 40 users and 1 key informant using interview method. Observation and documentary analysis were used as secondary data collection method. Data analysis was done qualitatively and presented using direct excerpts, narrative explanations and supported by figures and tables. Findings show that local communities require all kinds of information in their day to day life with particular emphasis on agricultural and health information. However, there is a general observation that digital villages are not being used by local communities to access this information due to lack of technological knowhow, shortage of finances and the social perception of the digital villages. The study recommends review of the current digital villages' model in order to enhance their usage as a source of information. This includes collaborating with local institutions to generate local content so as to meet the needs of local communities, marketing of digital villages as a source of information and improving quality of services offered in the digital villages. The study concluded that, access and use of information in the digital villages should be enhanced by addressing the challenges and adopting a new framework of implementation proposed under this study.

TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ACKNOWLEDGEMENTS iv
ABSTRACT v
TABLE OF CONTENTS vi
LIST OF TABLES ix
LIST OF FIGURES x
LIST OF ABBREVIATION xi
CHAPTER ONE 1
INTRODUCTION AND BACKGROUND INFORMATION 1
1.1 Introduction 1
1.2 Revolution of Telecentres 3
1.3 Statement of the Problem 6
1.4 Aim of the Study 6
1.5 Objectives of the Study 7
1.6 Research Questions 7
1.7 Assumptions 7
1.8 Significance of the Study 8
1.9 Scope 8
1.10 Limitations 9
1.11 Definition of Operational Terms 10
CHAPTER TWO 12
LITERATURE REVIEW 12
2.1 Introduction 12
2.2 Theoretical Framework 13
2.2.1 Information Chain Model 15
2.3 The Concept of Telecentres/ Digital Villages 24
2.3.1 Digital Villages 26
2.4 Information Needs 28
2.5 Telecentres and Information Accessibility 30
2.6 Sources/Channels of Information Access 32

2.7 Topology and Operating Models of Telecentres 33
CHAPTER THREE 38
RESEARCH METHODOLOGY 38
3.1 Introduction 38
3.2 Philosophical Interpretation 39
3.3 Research Strategy 40
3.4 Research Approach 41
3.5 Study Population 42
3.5.1 Target Population 42
3.5.2 Accessible Population 42
3.6 Sampling 43
3.6.1 Purposeful Sampling 43
3.6.2 Purposeful random sampling 44
3.6.3 Sample size 44
3.7 Data Collection Methods 46
3.7.1 Semi-Structured Interview Method 46
3.7.2 Document Analysis 47
3.7.3 Observation 47
3.8 Validity and Reliability 48
3.9 Data Analysis 50
3.10 Ethical Consideration 51
3.11 Chapter Summary 51
CHAPTER FOUR 52
DATA PRESENTATION, ANALYSIS AND INTERPRETATION 52
4.1 Introduction 52
4.2 Response Rate 52
Table 4.1: Response Rate Analysis 53
4.3 Demographic Data 53
4.3.1 Distribution of Respondents by Gender 54
4.3.2 Distribution of Respondents by Age 55
4.3.3 Distribution of the Respondents by Level of Education 56
4.3.4 Distribution of Respondents by Occupation 57
4.4 Information Needs Analysis 58

4.5 Sources of Information 60
4.6 Services Offered at the Digital Villages 61
4.6.1 Quality of Services Offered at the Digital Villages 63
4.6.2 Use of Internet Services in the Digital Villages 64
4.6.3 Use of Pasha Portal in the Digital Villages 71
4.7 Challenges Affecting Access to and use of Information in the Digital Villages 72
4.7.1 Financial Factors 73
4.7.2 Technological Factors 74
4.7.3 Social Factors 74
4.8 Chapter Summary 77
CHAPTER FIVE 78
SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS 78
5.1 Introduction 78
5.2 Summary of Major Findings 78
5.2.1 Information Needs 79
5.2.2 Sources of Information 79
5.2.3 Use of Digital Villages to Access Information 80
5.2.4 To Explore Challenges Affecting Access and Use of Information in Digital Villages 82
5.3 Conclusion 83
5.4 Recommendations 84
5.5 Proposed Framework for Improving Access to Information in the Digital Villages 87
5.6 Suggestions for Further Research 90
REFERENCES 91
APPENDIX I: LETTER OF INTRODUCTION TO THE RESPONDENTS 100
APPENDIX II: INTERVIEW SCHEDULE FOR DIGITAL VILLAGE USERS 101
APPENDIX III: INTERVIEW SCHEDULE FOR THE MANAGERS/OWNERS OF DIGITAL VILLAGES 105
APPENDIX IV: INTERVIEW SCHEDULE TO THE SECRETARY - DIRECTORATE OF ICT BOARD 106
APPENDIX IV: OBSERVATION CHECKLIST 108
APPENDIX V: RESEARCH PERMIT 109

LIST OF TABLES

Table 2.1: Different Criteria of Classifying Telecentres 34

Table 3.1: Sample Size Analysis 45

Table 4.1: Response Rate Analysis.....53

Table 4.2: Distribution of Respondents by Gender (n=40).....54

Table 4.3: Distribution of Respondents by Age.....56

Table 4.4: Distribution of the Respondents by Level of Education (n=40).....56

Table 4.5: Some of the Excerpt on the Quality of Services Offered in the Digital Villages63

Table 4.6: Information Accessed from the Pasha Portal.....71

Table 4.7: Challenges Affecting Access and use of Information in the Digital Villages..72

LIST OF FIGURES

Figure 1.1: The Information Chain Model (Heeks, 2005:13) 16

Figure 3.1: Research Onion Diagram (based upon Saunders et al's diagram, 2009) 39

Figure 4.1: Category of Users (n=40) 55

Figure 4.2: Distribution of Respondents by Occupation (n=40) 57

Figure. 4.3: Comparison of Kangundo and Mukuru by Occupation 58

Figure 4.4: Information Needs of Digital Village Users (n=40) 59

Figure 4.5: Sources of Information (n=40) 61

Figure 4.6: Overall Distribution of Services Used by Respondents (n=40) 62

Figure 4.7: Uses of Internet Services in the Digital Villages (n=34) 65

Figure 4.8: Education use of Internet 67

Figure 5.1: Proposed Model for Information Access in Digital Villages 88

LIST OF ABBREVIATION

ACWICT	-	African Centre for Women & ICT
C2G	-	Citizen to Government
CBO	-	Community Based Organization
CCK	-	Communication Commission of Kenya
CIDA	-	Canadian International Development Agency
DANIDA	-	Danish International Development Agency
DVP	-	Digital Villages Project
FAO	-	Food Agricultural Organization
G2C	-	Government to Citizen
G2G	-	Government to Government
ICIPE	-	International Centre of Insect physiology and Ecology
ICT	-	Information and Communication Technology
IDRC	-	International Development Research Centre
ITU	-	International Telecommunication Union
KARI	-	Kenya Agricultural Research Institute
KIHBS	-	Kenya Integrated Household Budget Survey
KNBS	-	Kenya National Bureau of Statistics
MCT	-	Multipurpose Community Telecentres
NGO	-	Non Governmental Organization
OECD	-	Organisation for Economic Co-operation and Development
UCRC	-	Ugunja Community Resource Centre
UNDP	-	United Nations Development Programmes
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
USAID	-	United States Agency for International Development
WSIS	-	World Summit on the Information Society

CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

1.1 Introduction

The vision and the guiding principles of the World Summit on the Information Society (WSIS) envisage promoting the use of Information and Communication Technology (ICT) based products, networks, services and applications to help countries surmount the digital divide. According to Plan of Action adopted by WSIS of improving connectivity and access to ICT by 2015, one of the indicative targets is connecting marginalized and rural communities with ICT and establishing community access points (WSIS, 2003).

The WSIS action plan provides a detailed guide on establishing multi-purpose community public access points which requires that individuals, organizations and communities benefit from having access to information and knowledge from these access points. This sentiment is shared by, Ariyabandu (2009) who notes that, governments should establish community access points but ensure that the services such as Internet are provided to their citizens at affordable costs or free of charge.

The Government of Kenya recognizes the importance of ICT in economic development and has therefore initiated major steps to promote its use. One of the major initiatives that the Government is pursuing is the Digital Villages Project (DVP) also known as telecentres. Gomez and Hunt (1999) views telecentres as a solution to the development problems around the world because of their ability to provide desperately needed access to Information and Communication technologies (ICT). Telecentres have considerable latent for narrowing the digital divide in remote, rural and disadvantaged communities.

They can be especially useful in helping developing countries and rural areas take advantage of the information economy, access education, government information, healthcare and other services, and develop socially and economically.

Whyte (2000) defines a telecentre as a “physical centre that provides public access to long-distance communication and information services, using a variety of technologies, including phone, fax, computers, and the Internet. Telecentres can be publicly or privately owned, be part of a public or private franchise, or be provided by international donors. They run the spectrum from "phone shops" through to "cybercafés," cottage telecentres for telework or telecommuting, and specially constructed multipurpose community telecentres (MCTs), some with advanced services, such as medical diagnosis and telemedicine”.

The Telecentre concept has been widely adopted in the United States, Canada and Australia. However, in these countries the focus is more on advanced services such as Internet access and video conferencing rather than on basic telephone services (Jensen and Esterhuysen, 2001). In developing countries in Africa and elsewhere, public facilities are needed for basic access, and for value-added services that can contribute to the social and economic welfare of the community. Over the past two decades, ICT access points have proliferated in many developing nations with the support of governments, donor agencies, non-governmental organizations (NGOs) and commercial enterprises.

The need to improve accessibility of information in sub Saharan Africa led to a number of telecentres being established by various organizations. The major aim was to ensure

that there is improved flow information to the rural and marginalized communities. According to Kamba (2009) over 35 telecentres were established between 1997 and 2000 by the International Development Research Centre (IDRC) through its ACACIA projects in several African countries including Benin, Uganda, Tanzania, Mali, Senegal, Mozambique and South Africa.

1.2 Revolution of Telecentres

Over the past decade, Information and communication technology (ICT) has created a broad range of economic and social activities. Countries that have maintained high economic growth and development have given attention to the role of ICT as both an economic and social enabler. Utilization of ICTs has given rise to powerful new economies based on knowledge and information. This has resulted in new avenues of development, employment, productivity, efficiency, and enhanced economic growth. (Vision 2030, MTP)

The idea of community access points emerged in the 1980s with the introduction of the telecottages in Scandinavia and Community Technology Centers (CTC) in the United States of America. According to Roman & Colle (2002), the initial purpose of telecottages was to fight against marginalization of remote rural places in the information society. In the mid 1990s a new breed of telecottages appeared in Hungary. These were built around social and economic development, computers and the Internet. This was part of a more robust movement that marked the close of the 20th century, with a variety of international organizations supporting the diffusion and adoption of ICTs and telecentres (Jensen and Esterhuysen, 2001).

In Africa, Telecentres have received significant support from UNESCO, the International Telecommunication Union (ITU), the International Development Research Centre (IDRC) and a number of other international development agencies (Rose, 1999). The governments of a number of countries, as well as telecommunications operators, have also contributed to the spread of access to services. According to Jensen and Esterhuysen (2001), there are several pilot telecentre projects scattered throughout the continent. Similar sentiments are shared by Oestmann and Dymond (2001) who notes that a significant number of such centres have been piloted and implemented by various governmental and development agencies across the globe. These pilot projects have been set up to test different models, mechanisms of implementation and strategies for sustainability. The most well known of these projects are the ITU/UNESCO/IDRC projects in Benin, Mozambique, Uganda, Mali and Tanzania, and the South African programme supported by the Universal Service Agency (USA).

In Kenya, the government, together with external stakeholders and private contractors, is increasing its ICT investments in order to bridge the digital divide. According to ICT board (2010), most of the ICT facilities in Kenya are in urban areas. This has resulted in glaring disparities between urban and rural areas in the distribution of ICT facilities. To redress the disparities, the Kenya ICT Board is implementing the Digital Villages project (DVP) under the Kenya Transparency Communications Infrastructure Project, which will see a creation of network of information facilities across the country. By 2012 there were 39 digital villages spread all over the country.

The project has been branded to “pasha” which is a Swahili word that means to ‘inform’. The Digital Village Project (DVP) is an integral part of an innovative public private partnership (PPP) for taking ICTs to the rural communities in Kenya. DVP seeks to harness the vast untapped potential of the rural sector by making information more accessible to the wider population through the development and utilization of ICT facilities in the rural areas.

According to the ICT board, the objective of the project is to provide a suite of services to the public via computers connected to the internet. The services include government services; community based services as well as a host of commercial services. Specifically, digital villages are supposed to provide the following services to the rural communities:

- Enhance information as communities shall be exposed to news and trends that may positively impact their lives.
- Provide employment for Kenyans both directly through economic activity that the centre will generate and secondarily through the opportunities that the information will provide.
- Enhance provision of government services. Kenyans will be able to access government services such as NSSF statements, driving license application forms, police extracts among others, from the Pasha Centres.

The digital village concept was part of a digital inclusion strategy aimed at easing access to technology and information in rural areas. They were envisaged to bring about much

transformation in the rural areas of Kenya by providing access to information, services and means of communication.

1.3 Statement of the Problem

The dearth of documented evidence on general performance of the digital villages can be interpreted to mean that digital villages project is being implemented without due consideration of lessons that can be learnt from other community based ICT initiatives especially in terms of access and use of information. Similar initiative already exists in many communities across the country in the form of telecentres, for example, the Communication Commission of Kenya (CCK) telecentres and Maarifa centres by the ALIN foundation. As is the case for any major project, before further developments are planned, there is a need to conduct an evaluative assessment. This study therefore, undertakes to examine the extent to which people use existing digital centres to access information and identify factors affecting their use. By conducting such a study, the dynamics surrounding use of such facilities can be better understood. With this understanding, variables influencing use of the digital villages can be isolated and appropriate measures can be implemented to ensure that their intended purpose of easing access to technology and information in the rural areas is achieved.

1.4 Aim of the Study

To investigate access to and use information in Mukuru and Kangundo digital villages by local communities with a view of proposing measures that may enhance the usability of the digital villages.

1.5 Objectives of the Study

1. To determine the information needs of the communities served by Kangundo and Mukuru digital villages.
2. To examine the sources of information used by the communities in Mukuru and Kangundo to access information
3. To find out the extent to which Mukuru and Kangundo digital villages are used by the communities to access information.
4. To examine the factors affecting the access and use of information in the Mukuru and Kangundo digital villages
5. To make recommendations and propose a framework for improving access and use of information in digital villages.

1.6 Research Questions

1. What are the information needs of the communities served by Kangundo and Mukuru digital centres?
2. What kinds of information sources do people prefer to use?
3. To what extent are digital villages being used to gain access to information?
4. What role can the digital villages play in meeting information needs of the community?
5. What factors affect access and use of information in the digital villages?

1.7 Assumptions

The study was based on the assumption that:

1. Inadequate local content undermines the optimum usage of the digital villages.

2. Lack of awareness hampers the usage of digital villages as a source of information.

1.8 Significance of the Study

The study like any other meaningful research has pragmatic, policy and knowledge significance to different stakeholders including government, Non-Governmental Organizations (NGOs) and the community (Mukuru and Kangundo communities).

By identifying what local people use digital villages for and the extent to which information is being used by communities, the study hopes that this information may be useful to government when drawing on the type of information sources and services to be provided by the digital villages commensurate with community needs.

The findings on factors influencing access and use of information at the digital villages can be used by key stakeholders such as government and Non-Governmental Organisations to strategize on more effective ways of providing services at the digital villages.

1.9 Scope

The scope of this study can be described in terms of institutional delimitations. Community access points such as digital villages have been classified according to the agencies initiating them such as the Non-governmental, Governmental and private community access points. The study therefore is based on the government initiated ICT projects, specifically the Digital Villages Project, given that other government initiated projects such as the Communications Authority of Kenya telecentres also exist.

Digital villages were established to provide a suite of services to the local communities that include employment to youth in the rural areas, improved business skills and knowledge and lastly enable local communities to easily access the internet to get information on certain issues such as how to start a business, how to access government services. The focus of the study was on the issue of access and use of information in the digital villages.

1.10 Limitations

Researchers can be successful in developing deeper understanding of a phenomenon, but nature places limitations on ever acquiring complete understanding in the sense that knowledge can never be certain. Based on this sentiment, some of the notable limitations are as follows:

i. The respondents chosen for the study were restricted to active users. It should have included all the community members (Non users) living around the Digital villages to find their view on why they do not use the Digital villages.

ii. At the level of data collection, it was beyond the researcher's ability to fully eliminate problems of maturation (biological and psychological problems among subjects which influence research findings). Otherwise, the best interview skills were employed when administering interview schedules.

1.11 Definition of Operational Terms

Telecentres

A telecentre is any kind of arrangement seeking to provide shared and mediated access to information and ICT-enabled services in rural areas through new technologies especially computers and Internet.

Digital Villages

A Digital Village is an E-center which provides services to the public such as internet, printers, fax machines, telecommunication, provide training and education. In addition provide government services to the rural and underserved areas of Kenya, for example applying for government jobs and driving licenses through the pasha portal.

Internet

Refers to a worldwide system of networks and computers connected over international telecommunication backbone and routed using Internet protocol suite (IPS) address, so as to allow participants to dialog with each other and to find, use and exchange information resources on computers of other academic institution, private companies, government agencies and Individuals.

Government

A Government is an organization, machinery or agency through which political unit exercises its authority, makes and enforces laws, administers public policy for the country, land area, people or organizations. It also refers to worksites affiliated to local or nation governments including but not limited to public service agencies.

Access to Information

The concept of access to information is related to the ability of users to obtain information in the possession of the state and in other cases private entity, for the purpose of being informed about the activities of the state. Borgman (2000) defines access to information as "connectivity to a computer network and to available content, such that the technology is usable, the user has the requisite skills and knowledge, and the content itself is in a usable and useful form"

Usability

According to ISO 9241 standard, usability is the extent to which a product (herein the digital villages) can be used by specified users to achieve specific goals with effectiveness, efficiency and satisfaction in a specified context of use.

Information Sources

According to Mtega and Benard (2013), Information sources are points where information which is in either print or electronic format can be accessed; they may include people and organizations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Literature review is an important step of the research process. As noted by Boote and Beile (2005:3), "A thorough, sophisticated literature review is the foundation and inspiration for substantial, useful research". Literature review is a summary of what has been published on a specific topic. It's a recap and re-organization of important information related to a given topic. Literature review allows the researcher to gain insights on the current knowledge in his current field of study.

The review of related literature involves the systematic identification, location and analysis of documents such as articles, abstracts, reviews, monographs, dissertations, books, other research reports and electronic media, which contains information related to the research problem. The review has several important functions that make it well worth the time and effort. The major purpose of reviewing literature is to determine what has already been done that relates to the research topic. This knowledge not only avoids unintentional duplication, but also provides the understanding and insights necessary to develop a logical framework.

There are several ways in which literature review are organized. These are chronological, methodological or thematically. Chronological is where literature is organized along progression of time, that is, materials are analyzed according to when they were published. Methodological on the other hand, is where materials are analyzed based on the method used in the literature being reviewed. Finally, thematic reviews are organized

around topics or issues. The current study adopted theme analysis in organizing its literature review.

The review focused on key themes of the research topic, this included the concept of telecentres/digital villages; the origin and history of telecentres; Information needs of the community; Telecentres and information accessibility; factors affecting the use of telecentres; and challenges facing information access in telecentres.

2.2 Theoretical Framework

Research theories and models are formulated to explain, predict and understand a phenomenon (Abend, 2013). Theories that gain recognition in a discipline shape the field, help define the scope of practice, and influence the training and socialization of its professionals. Today, no single theory or theoretical framework dominates research or practice in community based ICT projects and information access. A review of journal articles published in the past two decades have revealed that a number of theories and models have been used, but only a few of them were used in multiple publications and by several authors.

Some of the theories and models that have been propounded to explain issues of community based ICT projects and access to information include; the ICT4D model by Heeks, information utilization capacity theory by Curras, and the three-stage information society model by ITU. In identifying the desirable framework, the Information Chain model, was adopted as the preferred model for this research.

Three Stage Information Society Model

The three stage information society model was developed by International Telecommunication union in 2009 as a generic model for information society measurement. According to ITU, for a country to transform and become an information society it has to undergo a three-stage process. These stages are: stage 1- the ICT readiness stage which is the level of networked ICT infrastructure, stage 2- ICT intensity which reflects the level of use of ICT in the society and lastly stage 3-ICT impact which reflects the outcome of effective use of ICT use. The three stage model has been majorly used in ICT- Development Index (IDI) studies to raise awareness on future policy decisions among policymakers. In their report on measurement of information society, ITU (2011) one of the weaknesses of this model is that the composite indices used are always questioned since the non homogeneous nature of countries makes it difficult to derive a generic indicator.

The scope of the current study, "access and use of information" is too narrow for information society model. The study therefore did not use this model since its scope is too wide as compared to the current study.

The Information Utilization Capacity Theory

This theory was propounded by Curras in 1986. The theory indicates that, utilization of information is dependent on the ability of the user to access information and later utilizes it. The capacity to utilize available information is reliant on certain cultural, socio-economic, political and geographical variables. It also includes the appropriateness of the information, the information channel and the information provider's characteristics.

The information capacity theory has been used majorly in business studies to determine the capacity of customers to utilize information so as to increase productivity. However, Research in social sciences and information sciences have adopted this model to explain information needs among rural communities, for instance Zaid (2011) uses this theory to explain information needs of women in Ekiti State, Nigeria. One of the major strengths of the theory is that the variables comes our clearly which helps to creating parameters that are easy for comparison. The current study did not adopt this theory since it did not provide for the use of information communication technology in information access. The theory tends to be bias towards information seeking studies.

In identifying the desirable framework, the Information Chain model, was adopted as the preferred model for this research as explained below.

2.2.1 Information Chain Model

Information chain model has been utilized in studies across a range of disciplines. The most notable works relating specifically to ICTs and information access includes: Heeks, 2005; Heeks 2008; Gigler, 2004 and Akther, 2012. Heeks in his work gives much more focus on information above information driven technologies. He considers the technology to be useless, as long as it does not support information processes. Emphasizing Heeks view point, Gigler (2004) points out that, technological factors such as infrastructures, computer ownership and access to technology cannot solve the major challenge of ICT development. He considers the major challenge to be transferring data access from internet into meaningful information and availability of social resources to implement the information into the practices in the communities.

According to Heeks (2005), the contribution of ICTs to socio-economic development must be founded on an understanding of information in development. He believes that understanding Information chain provides means for understanding the activities and resources required for information to contribute to development. The model shows that the utter presence of data is not enough, but that communities need to be able to access the data, assess its qualities and apply it to their own local needs. The four elements in which the model is anchored include data resources, economic resources, social resources and action resources.

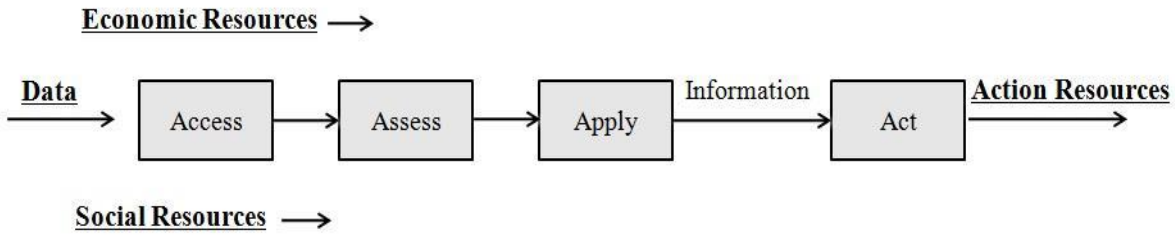


Figure 1.1: The Information Chain Model (Heeks, 2005:13)

In conceptualizing the information chain model with the current study, the researcher looked at data resources as the availability of local content in digital villages, economic resources as the infrastructure and affordability of services in the digital villages, social resources as the technological knowhow and the perception of the digital villages by the local communities, and finally the action resources as the ability of the users of digital villages to use information for development. The elements of the model are discussed further below:

i) Data Resources (Local Content):

This element refers to the availability of data resources (Local content) in the digital villages. Individuals are mainly concerned with information that is relevant to them. There is a deluge of information available through information and communication technologies (ICTs) but the amount of data that is directly relevant to local communities may be relatively small. According to Organization for Economic Co-operation and Development (OECD), the content that is most important to people is typically in their own language and is relevant to the communities in which they live and work, this relevant content is often referred to as local content. There is a strong need to create local ICT based content, relevant and accessible to the community, in order to make the digital villages truly a community centre.

ICTs have the ability to disseminate information widely both locally and globally, but there is a danger of the local communities consuming irrelevant information since most of the content in these ICTs are global and does not fit the needs of local communities. This is argument is supported by Ballantyne, (2002:), who notes that developed countries are more ICT-enabled than developing countries and have published much more of their local content, resulting in the danger of developing countries having easy access to globalized knowledge and thus turning them into consumers of distant and potentially irrelevant information.

Currently, content for ICT applications primarily originates from developed countries and therefore the content produced in the developed countries is often not appropriate or useful in developing countries (Subramanian, Nair & Sharma, 2010). To facilitate greater

access to ICT and more relevant use of these technologies, there needs to be an emphasis on content development at the local level. ICT initiatives which aim to bring local communities and other marginalized groups into existing global information flows may fall short unless attention is paid to local knowledge systems and content.

Kenya is at the forefront of innovation in local content on the Internet as attested by the adaptation of global solutions (OECD, 2011). Websites such as uzanunua.com, an adapted version of e-bay is used by Kenyans to buy and sell goods online which helps in marketing of products by local communities. There is a huge potential for Kenyan initiatives and the local content being generated. Ushahidi, a local software developed to provide more and accurate information about post election violence in 2008, have benefited other countries such as Chile, Haiti, Russia and Japan in the aftermath of disasters in their countries.

The Kenya government has also been in the forefront in the creation of local content through its e-government services and the tandaa project at the ICT authority. The government seeks to increase and diversify sources by promoting employment in the development of local content on the Internet. It is providing incentives to local content providers through reduced licence fees, loans for the development of local content, access to technical assistance and training as well as awards for best content providers (Bruegge, 2011). According to OECD, government through the ministry of Information and Communication has created content that is not only being consumed locally but all over the world for example, the Tinga Tinga tales, an African folklore tales have been

commissioned by BBC for its CBeebies channel and by Disney Channel for its Disney Junior block.

In general, we can say that a lack of visible local content in digital forms in Kenya has little to do with ICTs, it is more about the way people value their own culture, traditions, and languages. Ballantyne (2002) believes that by networking producers and intermediaries, existing local content can be channelled to local and community access centres where it can be accessed and used for development.

ii) Economic Resources

Accessing information from ICTs requires a lot of Economic resources including telecommunications infrastructure to provide network access, electrical infrastructure to make ICTs work, infrastructure to keep all the technology working, money to buy or access the ICTs, usage skills to use ICTs, and literacy skills to read the content (Heeks, 1999).

The Kenya Integrated Household Budget Survey (KIHBS) conducted by the Kenya National Bureau of Statistics (KNBS) indicated that there are roughly 20.6 million Kenyans living in households whose reported income expenditures was insufficient to afford basic necessities. The survey further indicate that majority of the 46 per cent of the population living below poverty line are in rural areas. The poverty level in rural and semi-urban areas makes it difficult for communities to access and use information in the digital villages.

According to Panos (1998) new communications technologies are revolutionizing access to information but the revolution is unlikely to reach the poor. In a world where 80% of the world's population has no access to reliable telecommunications, and one third has no access to electricity (Panos, 1998), it is hardly surprising that the ICT based Information reaches few poor people. Likewise, more than half of the low-income countries' population is illiterate, with a far greater proportion unable to read English, the language that dominates digitized information (UNDP, 1998).

In support of Heeks information chain theory, Foley, Alfonso & Ghani (2002) identifies economic factors such as low-income, low level of education and lack of technology that influences use of Information in telecentres. Akinsola, Herselman & Jacobs (2005) also added other factors that influence the use of ICTs by rural communities: These include low literacy rates; lack of awareness/understanding of ICT; the cost of financing and the availability of funds; technology adaptation; lack of technical capacity/maintenance; and lack of infrastructure and social amenities.

According to Buhigiro (2012), affordability of services and ability of users to access information is a major challenge among Local communities. Majority of people in developing countries who live in rural areas depend on subsistence farming such as agriculture and livestock farming, and have insufficient funds to pay for the information services offered in the digital villages. In support of this view, Falch & Anyimadu (2003) pointed out that "although there is an obvious need for access to telecommunication facilities in rural areas, it may not be possible to provide the service at prices affordable to the local community".

ICT initiatives is an expensive venture, the cost associated with acquisition of infrastructure is not affordable to local communities. Although government and donor agencies have tried to come up ICT based projects such as telecentres, very few exist in low-income countries (Heeks 1999). The Kenyan government through Kenya ICT board has started Community based projects such as the Digital Villages' Project and KENNet to cushion the communities against the overt resources so that they can be able to access information from the internet.

The electrical infrastructure to supply electricity is a major obstacle in Kenya. Electricity is not only expensive for a local community project with a very limited budget but power outages and rationing affect the operation of such initiatives. According to Hellström (2003), Power shading and electrical spikes can easily destroy the equipment which is expensive to acquire. He argues that there is need to acquire Uninterrupted Power Supply (UPS) unit so as to ensure that computers are shut down properly even power goes off.

iii) Social Resources

Local communities require more than economic resources for them to make use of data transmitted by ICTs. They need the motivation, confidence and knowledge to access, assess and apply the data, and they must also trust the source of data/information. These resources are discussed below:

Source Proximity; Heeks (1999) believes that data is created within a particular context and retains embedded characteristics of that context: it contains what its creators do know and do feel is important and misses out on what they do not know or do not feel is important; it reflects their political and economic beliefs; it reflects their culture. This

sentiment is shared by Wilson (1999) who opines that personal characteristics such as beliefs held by a person, interests, needs or existing attitudes, personal cognitive need (knowledge base) may constitute barriers to access and use of information. Pornography is an example; people in the developing countries might believe that this is the norm in the West since there is so much of it available on the Internet.

Trust of Information Source; Before the community accepts data, they must trust both its source and its communication channel. Hellström (2003) says that content and means of transmission must be accurate and trusted by the community before it is communicated successfully. The owners of digital village should create confidence among the users by making sure that the content they transmit is reliable. This will make digital villages to be trusted as sources of information.

Confidence and Security; in order to use new communication channels, users must have confidence and feel motivated to take a certain amount of risk. In general, local communities lack confidence because of their social circumstance and experience. According to Buhigiro, (2012) confidence and security will grow if users are trained and assisted in assessing whether the information is true or not, as well as adapt the information to a particular need. Managers and staff at the digital villages should be readily available to assist users in the use of digital villages in order to build their confidence. In most remote places, people have never used computers and they may be reluctant to use them.

ICT Skills; According to Heeks (1999), Information creates knowledge, but knowledge is also needed to create information. It is knowledge that helps us to access information, by knowing where to find and how to use information sources. It is knowledge that helps us to assess information, by assessing whether it is truth or lies, of value or not. It is knowledge that helps us to apply information, by adapting it to our particular needs and circumstance. According to Ellen (2003) telecentres are supposed to be run by trained and skilled persons who will assist in training the users, a view shared by Hellström (2003) who notes that the only way to learn how to use the information effectively and to ensure the data reliability is through training. Trainers are needed so that they can help users in assessing whether the information is true or not, as well as adapt the information to a particular need.

iv) Action Resources

This element is related to the aspect of "use of information" in this research. Heeks (1999) believes that Information supplied via ICTs has no value unless it informs decision making and action. For example, information about markets is of no value if a farmer in rural area cannot deliver his produce to the market or information about new government tax rules is of no value if the entrepreneur cannot afford to pay tax. It is therefore important that the information accessed from the digital villages is used by the local community for their benefit.

A lot of research has been conducted on information seeking behaviour of users, but very little have been done on how information is processed after it has been acquired. The information Chain model provides a framework to ensure successful access to ICT-

enhanced information by the rural communities. It provides a mechanism on how data needs to be accessed, assessed and applied by users before action is taken. The model shows that the utter presence of data is not enough, but that communities need to be able to access the data, assess its qualities and apply it to their own local needs.

According to Owen (2007) information chain model is mostly represented as a conduit metaphor that is, a sequential representation that describes the various stages information traverses before action is taken. It involves description of the various stages of the information flow with little reference to previous or succeeding steps. The drawback is emphasised by Kamel in his study on ICT for Development (ICT4D) projects in developing countries, who notes that, the one way uni-directive information chain model is not sufficient to postulate the impact of ICT4D project.

2.3 The Concept of Telecentres/ Digital Villages

Access to information has the potential to bring about the needed social and economic change in a society (Ariyabandu, 2009). However, with the advent of new technologies there is a tendency for rural communities to be left behind in information access. This is aggravated by information evolution that has resulted in greater socio-economic inequality in society due to different level of access to computers and Internet. To mitigate such inequalities, Atieno and Moturi (2013) propose the use of telecentres to provide access to computers and Internet to allow for the public to access information. Ariyabandu (2009) advocates for telecentres as they provide public as opposed to private access to Internet and computers which has allowed better access to information and knowledge to remote and rural areas. Jensen and Esterhuysen (2001) add that community

access points (telecentres) are the only source, for many rural and remote areas in developing countries, to ensure access to ICT for everyone.

A telecentre has been defined differently by different scholars. Conradie (1998); Whyte (2000); Benjamin (2001) defines a telecentre as a facility that provides public community based access to ICTs as well as a range of information-based services. Harris (2001) in addition says that, the information acquired from the facility is used by the public for educational, personal, social and economic development.

The origin of telecentres can be traced back to 1980s when the first telecentres were established in Scandinavia and Denmark as social experiments in promoting the use of advanced information communications technology. Buhigiro (2012) as cited by Benjamin (2001) noted that the Scandinavian telecentres were established as means of improving access to telematics in rural and isolated areas.

In 1983, the first "community technical centre" was established in Harlem in the United States. According to Molnar and Karvalics (2000) the main objective of the community technical centres was to reduce the unfavourable effects of the digital gap that had evolved between the upper and lower layers of the American society in the access to, and use of, basic technological and communicational devices such as telephones.

In 1985, more telecentres were established in the remote villages of Vemda-len and Harjedalen in Northern Sweden. According to Molnar and Karvalics (2000) the establisher of the telecentres in swenden, saw the main aim of telecentres as the provision of basic telecommunications services for the local, isolated population. Some years after

the birth of the first telecentre, the number of European telecentres grew to some hundred; sentiments supported by Benjamin (2001) who pointed out that more than 230 telecentres had been established in Australia, Austria, Canada, Denmark, Finland, Germany, Ireland, Japan, Norway, Sweden, the UK and the USA by early 2000s. The main aim of establishing centres in these developed countries was to bring access to ICTs for people who normally do not have access to them.

In mid 1990s, telecentres started spreading in developing countries with the support of development agencies. In Africa, Telecentres have received considerable support from UNESCO, the International Telecommunication Union (ITU), the International Development Research Centre (IDRC) and a number of other international development agencies. The governments of a number of countries, as well as telecommunications operators, have also contributed to the spread of access to services. There are several pilot telecentre projects scattered throughout the continent. They have been set up to test different models, mechanisms of implementation and strategies for sustainability. The most well known of these projects are the ITU/UNESCO/IDRC projects in Benin, Mozambique, Uganda, Mali and Tanzania, and the South African programme supported by the Universal Service Agency (Hunt, 2001).

2.3.1 Digital Villages

The Digital villages' project originated from the Kenyan government's recognition that ICTs have been centered mainly in the urban areas, resulting in glaring disparities between urban and rural areas in the distribution of ICT facilities (Kenya ICT Board, 2009). The government in partnership with the private sector is taking ICTs to rural and underserved communities and making the ICTs affordable and accessible to the

underserved and rural populations (Kenya ICT Board). The project, initiated in 2008 by the Kenya ICT Board and funded mainly by the World Bank, aims at providing a suite of services to the public, especially those in the rural areas via computers connected to the internet.

Some of the services include health information, market price, e-learning platforms, online courses on vocational training, gaming and ICT, business & entrepreneurship training resources, agency banking services, employment opportunities both directly and indirectly through the economic activities the centers generate, and government services, for example, National Social Security Fund (NSSF) statements, driving license application forms and police abstracts (Kenya ICT Board, 2009)

According to the (Kenya ICT Board, 2009) the Digital Villages' aims were to; enhance social and economic development, create employment, Increase ICTs connectivity in rural and underserved communities, offer services such as e-learning platform and improve provision of government services.

Kenya ICT Board counts on three Pasha Models for their Pasha Centres, they include: The Capability Maturity Model (CMM), basic model (basic office services, internet surfing, and e-mailing), Standard model (basic skills courses, face to face support, and access to government services), Advanced model (remote technical support, wireless access to satellite places, educational and vocational course training room, and health advice room). Services currently offered are inconsistent across the two centres; basically they range from basic to standard. They mainly depend on the IT experience of the staff in the centre at the time.

2.4 Information Needs

Information is facts or knowledge needed to answer some question faced by people in their daily life (Mtega, 2012). People need information for their day-to-day activities and for the development of their environment and themselves. Dervin's (1992) notes that people seek information when they have identified gaps in their knowledge that prevent them from making sense of a situation in which they find themselves, solve a problem at hand or make an informed decision.

According to Reitz (2010) information need is a "gap in a person's knowledge that, when experienced at the conscious level as a question, gives rise to a search for an answer". The user often needs information to fill out a conceptualization of a problem or idea. The information seeking behavior is a problem-solving or decision-making process where an individual identifies possible sources, differentiates and chooses a few sources, locates or makes contact with them, and interacts with them in order to obtain the desired information

Identifying information needs is the first step towards satisfying the needs. According to Mtega (2012) an information seeking process involves a number of steps, including: identifying information sources, consulting the sources and accessing information. Mtega is further of the opinion that, choice of information sources is influenced by factors such as age, level of education and Economic factors. Having knowledge of how these factors influence information seeking behavior is important for improving access and usage of information in local communities.

Telecentres have been effective in providing information to empower rural communities by providing access to information on agriculture, education, business development, e-commerce and participation in e-governance. Issa (1998) in his study of information needs of rural dwellers in Kwara State, Nigeria, analyses several information needs of rural and disadvantaged communities in developing nations. In his analysis he identified a set of information needs such as health, agriculture and allied occupations, education, housing, employment, legal matters, crime and safety, policies and government. According to Kwigizile, Chilongola, J., and Msuya (2011) rural communities require information on agriculture, education, career development, health, non-governmental organization activities, Government related information and micro credit information. Mtega (2012) in his study concluded that rural communities needed all types of information, although each individual has specific information needs related to specific individual problems. Mtega further states that information needs vary from one individual to another due to different social economic conditions, occupation and basic survival needs.

According to Akanda and Roknuzzaman (2013), information needs of the rural communities maybe different mainly due to reasons such as level of education, economic activities, and social status. From the above summarization of information needs by rural communities, it is clear that they need information on all aspects of human endeavors. It is therefore important to note that development in these areas can only be realized when this information needs have been provided and fully met.

2.5 Telecentres and Information Accessibility

Information access and use has been considered for a long time as a means through which rural and disadvantaged communities can achieve any meaningful development. This sentiment is supported by Kamba (2009) who asserts that having access to the right information can address major problems that hinder rural community development and it can also improve chances for livelihoods. He argues that lack of access to adequate and right information at the right time to the rural communities undermines the efforts of improving the living conditions of the rural people by both governments and non-governmental organizations.

The Government of Kenya recognizes the importance of information in economic development and has therefore initiated major steps to promote its use. One of the major initiatives that the Government is pursuing is the Digital Villages Project (DVP) also known as telecentres. Gomez and Hunt (1999) views telecentres as a solution to the development problems around the world because of their ability to provide desperately needed access to Information and Communication technologies (ICT). They can be especially useful in helping developing countries and rural areas take advantage of the information economy, access education, government information, healthcare and other services, and develop socially and economically. In emphasizing the importance of information, Bell's 1979 study (as cited in Kamba, 2009) notes that:

> "The changing pattern of the new information age, the dependence upon information to create innovation and change, places a high premium on the ability of nations to access and use information to create advances in the society.

> Therefore, to produce a desire to change in human development, information deserves utmost attention for as long as man natural curiosity inheres in him".

The achievement of an information-based society is one of the main priorities of the Government towards the realization of national development goals and objectives for wealth and employment creation. Digital villages is seen by the government as the means to which this noble idea can be achieved. This is supported by Kamba (2009) who opines that connecting the rural communities to the global network can be made possible through the establishment of innovative community information centre (ICIC). When carefully designed and implemented (Kamba, 2009), ICIC promises great potentials in establishing a dynamic network for preserving, ordering and transmitting information to the rural communities. However, in this age of information revolution, providing the infrastructure, hardware and software alone is not sufficient. There is ample evidence to suggest that the sustainability of digital villages depends on recognizing the dimensions of access, because without sufficient access, digital villages will not be able to justify their existence, nor be demand-driven.

There are various reasons that are known to hinder information accessibility in rural areas. According to Ellen (2003), these factors include societal, institutional, psychological and intellectual ones. Societal factors are responsible with blocking the availability of resources necessary for satisfying the information needs within the society and institutional barriers are due to unwillingness of the information providers to provide information. Ellen (2003) states further that physical barriers to information accessibility are caused by poor information infrastructure while psychological barriers are due to the

failure of the individuals to perceive their information needs or failure to obtain needed information from appropriate providers. Other factors include basic infrastructures, (electricity, telecommunication, utilities, roads and transportation), low level of literacy, lack of proper information services, and technical competencies.

2.6 Sources/Channels of Information Access

There are several sources of information used by people in the rural areas to access information. Mtega (2012), Etta, Agonga & Katia (2001) mentions radio, television, newspaper and magazines, cell phones, face-to-face encounters, leaflets, libraries and the internet as some of the common media used by locals to access information. According to Mtega (2012) choice of information sources is influenced by several factors such as: demographic (age, gender and level of education), social, economic and cultural factors. Ownership of information sources like television sets, mobile phones and print resources depended much on the level of income of the information seeker.

Information has power only when used and applied effectively but this would not be possible if prospective users do not know appropriate sources to consult. Availability of sources sought, distance, and time taken to find a source could influence the utilization of sources of information by these rural communities. Accessibility and ease of use are the most important attributes of utilization of any source of information (Zaid, 2011).

There is poor information accessibility among developing nations, a phenomenon creating the so called information gap. Various alternatives have been thought as solutions to minimize the information gap. Print media, radio, telephone and television all aim at enhancing information availability. Modern Information and Communication

Technologies (ICTs) were also discovered so as to facilitate information sharing. ICTs are said to narrow the information and communication gap between rural communities and urban centers through giving rural people access to valuable information; and by transmitting indigenous information and locally produced knowledge (Sirimane, 1996). ICT like that of the internet are now offering valuable benefits in terms of improved vertical and horizontal communications among rural people, development agencies and government. According to Mtega and Malekani (2009):

> "ICTs enable communication, a process that links individuals and communities, governments and citizens, in participation and shared decision making".

When communities share information about their activities in fields such as agriculture, health, nutrition, and education, they provide a means through which governments and other agencies can serve them better. Rural communities and agricultural organizations can benefit equally from improved vertical channels of communication that enable rural communities to communicate with decision-makers and others concerned with development.

2.7 Topology and Operating Models of Telecentres

Public ICT access points are diverse, varying in the clientele they serve, the services they provide as well as their business and operational models. Analysis of literature shows that telecentres can be categorized variable: there are those who distinguish them on the basis of the technology availed in the telecentres, others on the basis of ownership and agencies initiating them while another group on the basis of the purpose in which the telecentre was established for example access to basic education, health and credit facilities or for commercial purpose.

Jensen and Esterhuysen (2001) have classified telecentres based type on the type of technologies housed in the telecentre. They classified telecentres into four broad categories: micro, mini, basic and full telecentre. A micro telecentre is a small shop that provides basic and essential services like telephony and e-mail while a full telecentre, is equipped with more sophisticated technologies including computers, printers, photocopiers, multimedia hardware, and video-conferencing equipments. On the other hand, mini and basic telecentres provides services that are in-between the micro and full models.

Mukerji (2008) in his study of operating models of telecentres in India, classifies telecentres according to ownership and the agencies initiating the telecentre that is, non-governmental, governmental and private. A summary the above aspect of telecentre classification is shown in table 2.1 below:

Table 2.1: Different Criteria of Classifying Telecentres

Particulars		Ownership of Individual Kiosk	Broad Purpose	Functional Orient.	Service Delivery
Civil Society Initiative	NGO Model	NGO (public)	People-oriented Development	Non-Profit	Mixed
	GO Model	GO (public)	People-oriented Development	Non-Profit	Limited
Govt. Initiative	GO-NGO Model	NGO (public)	People-oriented Development	Non-Profit	Mixed
	GO-CBO Model	CBO (public)	People-oriented Development	Non-Profit	Mixed
	GO –Franchise Model	Private Entrepreneur (public)	Mixed	Profit	Broad
Private /Market initiative	Individual Entrepreneur Model	Private Entrepreneur (public)	Commercial	Profit	Limited
	Private Franchise Model	Private Entrepreneur (public)	Mixed	Profit	Broad
	Private Corporate Model	Corporate (public)	Commercial	Profit	Limited

Source: Mukerji, (2008:7)

The digital villages have been classified both based on the ownership and the type of technologies being offered in the centres. According to the ICT board, digital villages are initiative of Government and other stakeholders. It adopts a Government- Franchise model whose broad purpose is both commercial and people oriented. According to a report prepared by IBM on the strategic Positioning of the Digital villages as a centre for rural empowerment and development, the Digital Village ecosystem includes various players including CBOs, NGOs, Telcos, churches, co-operatives, development partners and individual cyber-cafés. Another report by IBM on strategic framework for digital villages' project concludes that services currently offered are inconsistent across centres, and range from basic to advanced ICT initiatives. The services provided depend heavily on IT experience, background and community demographics for each individual owner.

2.9 Factors Affecting Access and Use of Information in the Digital Villages

Community based ICT projects have become one of the popular ways of introducing ICT to the local communities in rural areas. The digital villages for instance, have offered rural, remote, and peri-urban communities the chance to adopt ICTs to their benefit, thus enabling them to narrow developmental divide and the digital divide. This sentiments is supported by Buhigiro (2012) who noted that community based ICT have been one of the most common and relevant solutions to barriers of e-access in developing countries. On the other hand, Clark (2001) argues that telecentre users are driven to the telecentre "for quality, competitively priced and timely products, accessibility, customer service, new learning opportunities, social and work opportunities, less travelling, new and maintained services, and services to make them more efficient and competitive".

To better understand the role of ICT in community development, it is necessary to explore the factors that influence the use of digital villages, often categorized as socioeconomic factors and socio-personal factors. Various scholars have discussed these factors for example, Ellen (2000) described socio-economic factors as low-income, low level of education and lack of technology skills and socio-personal factors include attitudinal and behavioural issues such as low level of awareness, interest and acceptance of ICT usage. Akinsola, Herselman & Jacobs (2005) also added other factors that influence the use of ICTs by rural communities: These include low literacy rates; lack of awareness/understanding of ICT; scattered population in rural areas; the cost of financing and the availability of funds; technology adaptation; lack of technical capacity/maintenance; and lack of infrastructure and social amenities such as roads, water, energy and health.

The cost of services coupled with the fact that most of the rural communities are poor with low incomes is one of the major hindrances to the use of community based ICT projects to access information. According to Buhigiro (2012), lack of interest and acceptance of ICT usage in rural communities arises from seeing ICT as a luxury and not a necessity and this influences the use of telecentres facilities for information access. Ellen (2000) in her study notes that cost associated with internet access is key to the use of telecentres. The local communities will prefer to use other sources of information rather than pay to use the Internet to look for information.

Fontaine (2002:161) is of the view that, for telecentres to promote community access to information there must be some essential technological facilities. He highlights some of

the complement to access as “reliable hardware; appropriate software; awareness of ICT functions and benefits; effective training in use; equitable/affordable opportunities for use; sufficient literacy/language skills or access to information mediators; ability to synthesize, organize, and apply information; and ability to produce and disseminate information as well as receive it”.

The telecentre users in rural areas face challenges such as language problems and affordability. Most case studies conducted on telecentres in developing countries indicate that lack of knowledge of the English language, which is the predominant language on the internet, is found to be a substantial challenge to the effective use of telecentres in rural areas (Buhigiro, 2012). This is due to the fact that the applications of ICTs are programmed in foreign languages such as English. Most people in rural areas in developing countries are un-educated and they use local languages, hence this becomes a major challenge to the use of telecentres by the community

2.10 Chapter Summary

The chapter provides a review of the relevant literature that explores the concept of digital villages and telecentre, the historical development of telecentres, information needs of the rural community, telecentres and information accessibility, Sources of information, topology and operating models of telecentres, and finally factors affecting access and use of information in telecentres. It provides the reader with ongoing discourse about the topic and reports on what the scholars have already said on themes of the subject. It also provides a theoretical framework that guided the research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

"The value of, and need for objective, methodologically sound research is undeniable. Only through sound research designs can we eliminate threats to validity and draw scientifically valid conclusions to inform practice (Condelli and Wrigley, 2004)". There are several research methods researchers can choose from; however, Nolan 1997 (as cited in Kikulu, 2014) believes that the nature of the research problem and the researcher's philosophical orientation will determine the choice of appropriate methodology. The idea that a research should follow a particular methodology is not true since every problem scenario requires more than one solution to address it.

One of the fundamentals in the design of this study was to develop a robust and scientifically grounded methodology that would provide rich and detailed data about access to and use of information in the digital villages. To achieve this, a clear methodology was adopted known as a "research onion". It provides a clear framework that explains methods and strategies used in a research. The diagram below illustrates the research design framework adopted, see fig 3.1 below.

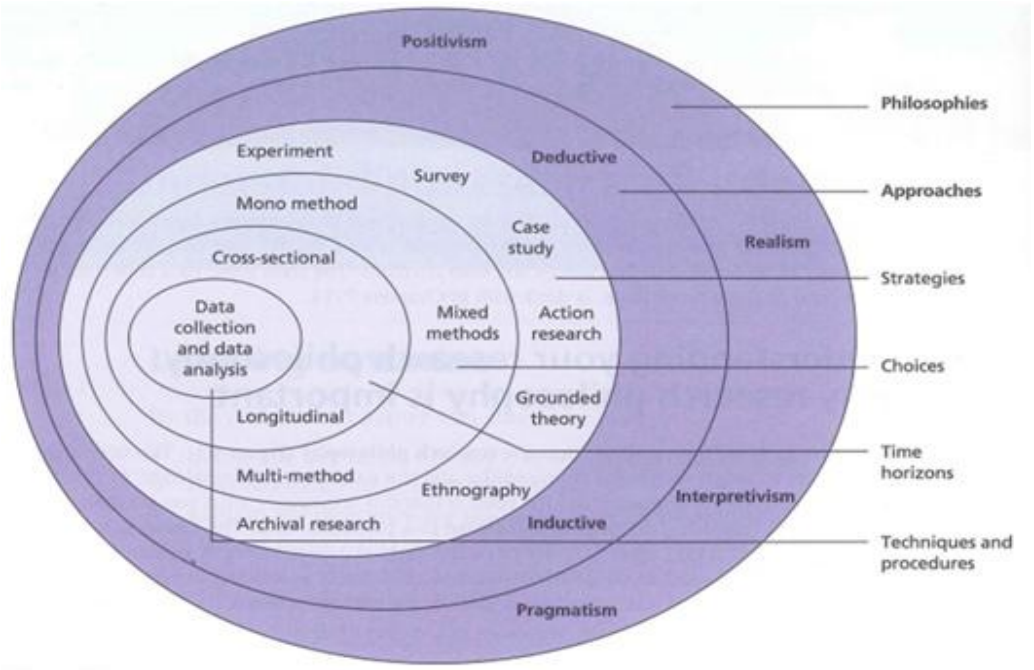


Figure 3.1: Research Onion Diagram (based upon Saunders et al's Diagram, 2009)

The essential elements of the research methodology as adopted from the research onion are discussed below. They include the philosophical interpretation, research strategy, research choices and techniques/procedures.

3.2 Philosophical Interpretation

There are three generally overarching means to establish what constitutes relevant research: positivism, interpretivism and critical theory (Crofts, Hungria and Monfries, 2011). All these paradigms are based on some underlying ontological and epistemological assumptions. Their choice in a study has considerable implications on the findings, interpretation and analysis of the findings and the resultant inferences. This realization amplifies the significance of reflectively and diligently selecting an appropriate means of inquiry in conducting research.

The underlying philosophical paradigm that was used in this research is interpretivism or qualitative approach. This approach is based on the belief that an individual's perception of the world is intrinsically tied to a stream of lifelong experiences and truth is ultimately interpreted in the light of such experiences (Weber, 2004). Further, qualities ascribed to research objects are socially constructed, that is, developed out of experience and not inherent as argued by positivists. In regard to the interpretivist approach to research, this study relied much on the experiences of people who use the digital villages as well as people directly responsible to seek explanation and interpretation of identified constructs.

3.3 Research Strategy

Traditionally, research strategies have been categorized as experiments, surveys and Case studies. These distinctions, however subtle, are based on original research questions, the people studied and the manner in which data is analyzed and presented. This study adopted case study as its research strategy. Case study, as defined by Yin (2003), refers to the collection and presentation of detailed information about a particular participant or small group, frequently including the accounts of subjects themselves. A form of qualitative research, the case study looks at an individual or small participant pool, drawing conclusions only about that participant or group and only in that specific context.

The case study approach can be exploratory, explanatory or descriptive (Yin, 2003). The researcher considers this study to be exploratory because the precise nature and characteristics of the problem are unknown. According to McKenzie & Danforth (2009), exploratory research is used to obtain greater understanding of a concept or to help crystallize the definition of a problem. Most case studies are qualitative in nature but can also be quantitative. They can also take the form of one case study or multiple case

studies. For the purpose of this research multiple case studies was used. The data collection methods employed may vary. Case studies traditionally rely on multiple sources of evidence such interviews, observation and document analysis. These methods were adopted and they are discussed further under data collection methods.

3.4 Research Approach

There are three major research paradigms in social and behavioral sciences. They include quantitative research, qualitative research, and mixed methods research. Quantitative research follows the paradigm characteristics of the Positivist researcher while qualitative research follows the paradigm characteristics of the Interpretivist researcher. On the other hand, mixed research involves mixing qualitative and quantitative research methods.

The study adopted qualitative research approach which is defined by Denzin and Lincoln (2000) as a naturalistic method involving interpretive approach to its subject matter. He believes that qualitative researches are naturalistic because they take place in a real world settings and the researcher does not attempt to influence the phenomenon of interest. Merriam (1998) describes a qualitative research as a holistic analysis of a single instance, phenomenon or social unit.

In this study, qualitative research approach made it possible to get respondent's experiences from their own perspectives. The qualitative study helped to find out the strengths, weaknesses and challenges faced by digital villages in terms of access and use of information by the local communities in Mukuru and Kangundo digital villages.

3.5 Study Population

A study population has been defined as a complete set of elements (persons or objects) that possess some common characteristic and conforms to a given specifications. According to Mugenda and Mugenda (2003), population can be classified as target population or accessible population.

3.5.1 Target Population

Target population is the entire group of people or objects to which the researcher wishes to generalize the study findings. It is the population of individuals or objects which the researcher is interested in describing and making statistical inferences about. According to 2009 population census Mukuru Slums had an estimated population of 201,042 people while Kangundo had an estimated population of 219,103 people. In this research our target population was all residents of Mukuru slums and Kangundo district.

3.5.2 Accessible Population

It is often impossible to study the whole of target population and it is therefore important to identify and define an experimental accessible population (Mugenda and Mugenda, 2003). Accessible population can therefore be defined as a subset of the target population or a portion of the population to which the researcher has reasonable access. The accessible population in this research was the end-users of the Mukuru and Kangundo digital villages and the staff of the digital villages. From the statistics and data kept by the digital villages there is an average of 300 users of digital villages in a month. However, there is indefinite number of end users in each centre.

3.6 Sampling

Sampling is the strategy of selecting a smaller section of the population that will accurately represent the patterns of the target population at large. There are a number of approaches in selecting a sample for a qualitative study. In this study, respondents included government officials in charge of the Digital Village project, Digital Village managers and users of the Digital Villages.

3.6.1 Purposeful Sampling

A purposeful sampling is the deliberate choice of an informant due to the qualities the informant possesses (Buhigiro, 2012). It is a non-random technique that does not need underlying theories or a set number of informants. According to Tongco (2007) a researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience. The aim of purposeful sampling is to afford the researcher, the opportunity to use cases that have the required information based on the objectives of the study. It has also been used in many studies (Ellen, 2002; Buhigiro, 2012 and Kulecho, 2012) to select cases that offer in-depth and rich information. Purposive sampling was used to select:

1. The digital villages to be studied
2. The ICT board in charge of Digital villages
3. The Digital village Managers

Digital Villages Project is a brain child of the Kenya ICT board, it was therefore necessary for the researcher to interview Director of the Digital Villages Project so as to get the in-depth understanding of the project. On the other hand, each of the Kangundo

and Mukuru Digital Village had a manager and staff working there. In line with purposive sampling, the researcher interviewed all the Managers of these Digital Villages. In addition, the researcher administered an interview schedule to selected staff in each of these Digital centres. Such officers were selected on the basis of availability.

3.6.2 Purposeful random sampling

Purposeful random sampling technique was used in selecting the users to be included in the research. According to Cohen and Crabtree (2006) purposive random sampling is a process of identifying a population of interest and developing a systematic way of selecting cases that is not based on advanced knowledge of how the outcomes would appear. The aim here is to increase credibility and not to foster representativeness.

In trying to identify samples within each case study the researcher did not attempt to obtain a representative sample of digital villages users because the variables with each community were too numerous for this to be achievable. The researcher visited the digital villages for a month on weekdays and purposely randomly identified 2 users per day who could provide the researcher with information. From this perspective, the researcher was able to interview 20 users in Mukuru and 20 in Kangundo Digital villages. The researcher settled on this numbers after it had reached a point of saturation and no new information was forthcoming.

3.6.3 Sample size

There is a common belief among researchers that the larger the sample the better the results which is not necessarily true. In qualitative studies the aim is not to get a representative sample of the population but to get valid, meaningful and insightful

information from the sample size. According to Hardon, Hodgin and Fresle (2004), Qualitative researchers often refer to the redundancy criterion: that is, a researcher should stop collecting data when there is no new information on which is forthcoming. Mason (2010) in his study, sample size and saturation in PhD studies, notes that although there are other factors that affect sample size in qualitative research, saturation has always been the guiding principle for researchers during data collection. On the other hand, Ritchie, Lewis and Elam (2003), are of the view that colleting more data does not necessarily lead to more or newer information. In quantitative studies, the desirable sample size is determined by the expected variation in the data: the more varied the data is the larger the sample size that will be needed to attain the same level of accuracy.

A total of fifty participants took part in this study. One director of the digital villages, One manager from each telecentre (total two participants), three staff members of Kangundo digital village, four staff members of Mukuru digital village and twenty users in each digital village (total forty participants).

Table 3.1: Sample Size Analysis

Category	Mukuru DV	Kangundo DV	Total
	Sample Size	Sample Size	
Director DVP	-	-	1
Manager DV	1	1	2
Staff DVs	4	3	7
Users	20	20	40
Total			**50**

3.7 Data Collection Methods

Qualitative research data collection methods were used to collect data. This included: interview method, documentary analysis and observations. According to Mills (2003), qualitative research uses narrative and descriptive approaches for data collection to understand the way things are and what they mean from the perspective of the research respondents.

3.7.1 Semi-Structured Interview Method

Yin (2003) believes that interviews are the most important sources of information for case studies and can yield useful information. Interviews provided an opportunity for the interviewer to investigate the responses of the participants which allowed him to pursue in-depth information around the topic (McNamara, 1999). It is particularly important in getting the story behind a participant's experiences. In defining an Interview, Saunders, Lewis and Thornhill (2003) opine that interviews allow the researcher to collect valid and reliable data that are important to research questions and objectives.

Interviews may be highly formalized and structured, using standardized questions or they may be informal and unstructured conversations. Based on the structure, Interviews can take three forms that is structured, unstructured and semi-structured method. This study used semi-structured interview method. The study adopted the semi-structured method, which according to Kothari (2004) is preferred for descriptive studies, because of providing a safe basis for both comparisons across cases in addition to enabling for generalisability.

The study adopted face to face method of data collection because it has a distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gaining their cooperation. It allowed the researcher to clarify ambiguous answers and when appropriate, seek follow-up information.

3.7.2 Document Analysis

Document analysis is an important qualitative data collection method based on the fact that institutions generally make efforts to document their policies, activities and programmes (Henning, Gravette & Rensburg 2004). Provision and analysis of a variety of documents was crucial for this study for two basic reasons. Firstly it was important for triangulation; comments made by key actor respondents during interviews were compared with information contained in documents. Secondly, this data collection technique enabled the researcher to gather information which would have taken more time to collect by other methods. The study reviewed documents such as reports, minutes of meeting, magazines and any other published materials.

3.7.3 Observation

Observations were particularly helpful in identifying occurrences that might not be discovered through interviews, including those that a respondent might not freely talk about in an interview or a Respondent might take for granted (Patton, 2002). It captures the unexpected, unusual or unsaid (Mayoux, 2012). It is also noted that the interviews are notorious for discrepancies between what people say they have done and what they actually did and observations provided useful checks for this (Robson, 2002). In addition, observations allowed the researcher to move beyond the selective perceptions and

opinions expressed in interviews (Cohen, Manion & Morrison, 2000), although they are themselves inherently subjective.

All observation was done inside the Digital Village. Users were observed when they entered the Digital Village and what they did on the internet until they left. Even though there were advantages discussed earlier of observation as a data collection method, there were limitations for example discomfort of the people being observed, time consuming and the Hawthorne effect, which is a change in the practitioner's performance due to being observed by the researcher (Polgar & Thomas, 2000). To minimize the effect of Hawthorne the observation was made without interrupting the people being observed and it was none participatory observation.

3.8 Validity and Reliability

The trustworthiness of qualitative research is often questioned by positivists, perhaps because their concepts of validity and reliability cannot be addressed in the same way in naturalistic work (Shenton, 2004). Indeed, Golafshani (2003) argues that the concepts of validity and reliability related to the quantitative research may not be applicable or support qualitative research. However, Noble and Smith (2012) argue that "although there are ongoing debates about whether terms such as validity, reliability and generalisability are appropriate to evaluate qualitative research, in the broadest context, these terms are applicable with validity referring to the integrity and application of the methods undertaken and the precision in which the findings accurately reflect the data, while reliability describes consistency within the employed analytical procedures".

According to Brink (1993), qualitative researchers avoid the terms validity and reliability and use terms such as credibility, trustworthiness, truth, value, applicability, consistency and confirmability, when referring to criteria for evaluating the scientific merit of qualitative research. To understand reliability and validity in a qualitative research, different definitions are given by many qualitative researchers from different perspectives.

According to Golafshani (2003) validity is concerned with the accuracy and truthfulness of research findings. McMillan & Schumacher (2006) pointed out that validity has the ability to address the question whether the researcher captures what the researcher thinks is valid. Validity is used to judge whether the research accurately describes the phenomenon that it is intended to describe (Bush, 2007). Reliability on the other hand, is concerned with the consistency and repeatability of the respondent's accounts as well as the researchers' ability to collect and record information accurately (Brink, 1993). Joppe (2000) defines reliability as "the extent to which results are consistent over time …and if the results of a study can be reproduced under a similar methodology".

To enhance the validity and reliability of this study, the researcher applied several techniques. First, was to give the respondents a choice either to be interviewed or not, this enabled the researcher to interview only those people who were willing to give information this increased the chances of obtaining truthful and credible information. Secondly, the researcher created rapport with the respondents so as to establish good relationship, as noted by McMillan & Schumacher (2006), positive relationship between the research and respondents is key to obtaining credible and truthful information from

the respondents. Another aspect that was used in improving the validity and reliability of the study was to compare the finding of the study with other evidence available such as the progress reports and observation of the digital villages. This was to ensure consistency and confirmibility of the results.

3.9 Data Analysis

Data was analyzed using qualitative methods of data analysis. White (2005) defines qualitative data analysis as "a systematic process of selecting, categorizing, comparing, synthesizing and interpreting data to provide explanations of the single phenomenon of interest". Creswell (2002) opines that qualitative data analysis is primarily an inductive process of organizing the data into categories and identifying patterns (relationships) among the categories.

In analyzing data for this study, the researcher opted to use thematic analysis, a qualitative analytic method, described by Braun & Clarke (2006) as a method used to identify, analyze and report patterns or themes within data. The process involved familiarization and coding of raw data collected from the field to give it meaning based on trends, patterns and relationships. According to Strauss and Corbin (1990) during coding, data are broken down into discrete parts, closely examined and compared for similarities and differences, and questions asked about the phenomena as reflected in the data. Once the patterns had been identified, data was grouped to create themes that were used in the study. As noted by Rice & Ezzy (1999) coming up with themes in the study required careful reading and re-reading of the data. The key themes in the study were information needs, sources of information, services offered in the digital villages and

challenges faced in accessing information. Further analysis of services offered in digital villages came up with sub themes under the use of internet services such as Education, employment, health and fitness, social connections and government services.

3.10 Ethical Consideration

A number of ethical issues were taken into consideration when carrying out the study. They include:

- Demographics data was collected for all respondents but disclosure was voluntary. The respondents were not forced to answer any questions.
- Respondents were given a guarantee that they will not be named. A description of respondents was used.
- Permission was sought for use and access to documentation for the purpose of document analysis (**attached is a research permit**).
- Respondents were given a letter with a brief summary of the research project and its aims, a statement guaranteeing anonymity and details of how to contact the researcher should they have any questions or concerns.

3.11 Chapter Summary

The chapter provides an overview of the research methods that were used. A clear methodology was adopted known as “research onion”. It provides framework that explains methods and strategies used in research. Its key elements include philosophical interpretation, research strategy, research choices and techniques/procedures. Other areas covered in methodology include validity and reliability of the study, data analysis, and limitations of the study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the finding of the study conducted in Kangundo and Mukuru Digital Villages. The analysis is based on data collected through semi-structured interviews with users of the digital villages and key informants such as managers, staff of the DV and the director of DVP. The data was complemented by documentary analysis and observations made from the digital villages.

In this chapter, there was an attempt to present the data in a manner that is easily understood and in which deduction and correlations can be drawn from it. The data was sorted in relation to the key themes and categories set out in the interview guidelines and questions. Each set of data was presented, analyzed and interpreted separately; this was done with the realization that as each set of data is presented, it becomes much easier to analyze and interpret it at the same time. Finally, since the study was based on qualitative research approach, the meanings derived from the findings were generally qualitative. To make them clearer, the researcher used tables, pie charts and bar graphs in its presentation.

4.2 Response Rate

Response rate has always been taken seriously in research since it has implications on validity and reliability of findings. When the response rate is high in any study, then it is most likely that the quality of the findings will also be high. This study has the benefit of 100% response rate. Different strategies were adopted by the researcher to boost the

response rate including making efforts to build personal relationship with the respondents, scheduling meetings through appointments set by the respondents and designing the interview schedules smart. The table below gives a summary of the response rate:

Table 4.1: Response Rate Analysis

Sampled Population Groups	Sample Population	Number of Respondents
Users of the DV	40	40
Managers of DVs	2	2
Staff of DVs	7	7
Director DVP	1	1

4.3 Demographic Data

Demographic characteristics such as age, gender and level of education was included in the research to provide ideal information on the characteristic of users of the digital villages. Buhigiro (2012) believes that factors such as age, level of education and gender affect the use of telecentres in accessing information. Although the respondents were purposely sampled, this was done randomly without due concern for gender. A summary of the demographic data collected is discussed below;

4.3.1 Distribution of Respondents by Gender

From table 4.2 below majority of the users of digital villages are male (23). Although the same is true with Kangundo digital village were majority of the users (18) are male, the opposite is true in Mukuru digital village where majority of the users are female (15) as compared to male (5).

Table 4.2: Distribution of Respondents by Gender (n=40)

Study area	Male	Percentage	Female	Percentage
Kangundo Digital Village	18	90%	2	10%
Mukuru Digital Village	5	25%	15	75%
Total	**23**	**57.5%**	**17**	**42.5%**

Hallberg, D., Kulecho, M., Kulecho A. and Okoth, L. (2011) in their case studies of Kenyan digital villages with a focus on women and girls agrees with the current study that the wide majority of the users of digital villages are men. They noted that male users generally believe that women have a lack of knowledge and understanding of ICT. It is not difficult to see that the dominant view is in reality the idea that technology is a male device and this induces fears on the women wishing to use technology. However, in Mukuru digital village the opposite is true (See figure 4.1), majority of the users of the digital villages are women. This can be attributed to the fact that Mukuru centre is located in a girl's institution and majority of the users are students from the institution. The

manager notes in the interview that *"... the centre has been of great help to the girls"*. (MM1)

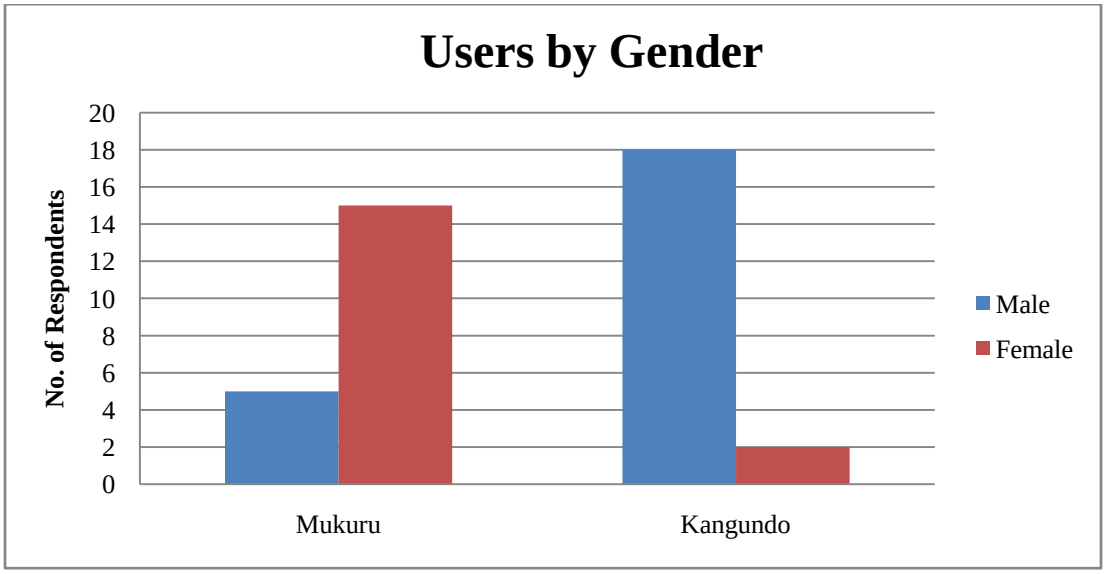


Figure 4.1: Category of Users (n=40)

4.3.2 Distribution of Respondents by Age

As shown in table 4.3, majority of the respondents were aged between 20-29 years old, closely followed by under 20 years. Respondents between ages 30- 39 years and those who were 40-49 years constituted the least number of respondents. From the observation made during the study, Majority of the visitors and users of the centres were young people aged between 17 and 35 years. A manager in Kangundo sums up the whole picture when he notes that, "*older people are not interested in the digital villages because they believe that technology is for the young people and it is too much for them". (KM1)*

Table 4.3: Distribution of Respondents by Age

Age (years)	Mukuru Centre (n=20)		Kangundo centre (n=20)		Overall (n=40)	
	Response	**Percent**	**Response**	**Percent**	**Response**	**Percent**
Under 20	7	35%	5	25%	12	30%
20-29	11	55%	10	50%	21	52.5%
30-39	1	5%	3	15%	4	10%
40-49	1	5%	1	5%	2	5%
50 and above	0	0%	1	5%	1	2.5%
Total	**20**	**100%**	**20**	**100%**	**40**	**100%**

4.3.3 Distribution of the Respondents by Level of Education

Regarding the level of education, majority of the respondents were secondary school leavers and graduates, while a few of the respondents had tertiary/college level of education. Those with primary school level of education had the least number (6) of respondents as shown in table 4.4. From analysis, it can be deduced that literacy level was an important component in determining the persons who visit the digital village. The findings aligns with literature review which indicated that low level of education and lack of technology skills are the key challenges affecting the use of telecentres in developing countries (Akisnola *et al*., 2005; Buhigiro, 2012).

Table 4.4: Distribution of the Respondents by Level of Education (n=40)

Education level	Response rate	Percentage (%)
Primary School	6	15%
Secondary School	15	37.5%
Tertiary/college	9	22.5%
University	10	25%
Total	**40**	**100.0%**

4.3.4 Distribution of Respondents by Occupation

Turning to distribution by occupation, majority of the respondents are students, teachers, health workers, farmers, and those who are unemployed. A few of the respondents form a group of other professions, namely civil servants, carpenters, builders, and market sellers. The fact that different categories of users visit the digital villages' shows that each individual has specific information need related to his occupation. The finding agrees with Mtega (2012) who concluded that people have specific information needs which relate to the specific problems they face and the decision they have to make. For instance, one of the farmers included in the study noted that: *"I use this centre to check the prices of mangoes in Nairobi before I take them to the market to avoid being exploited by traders..." (R18)*

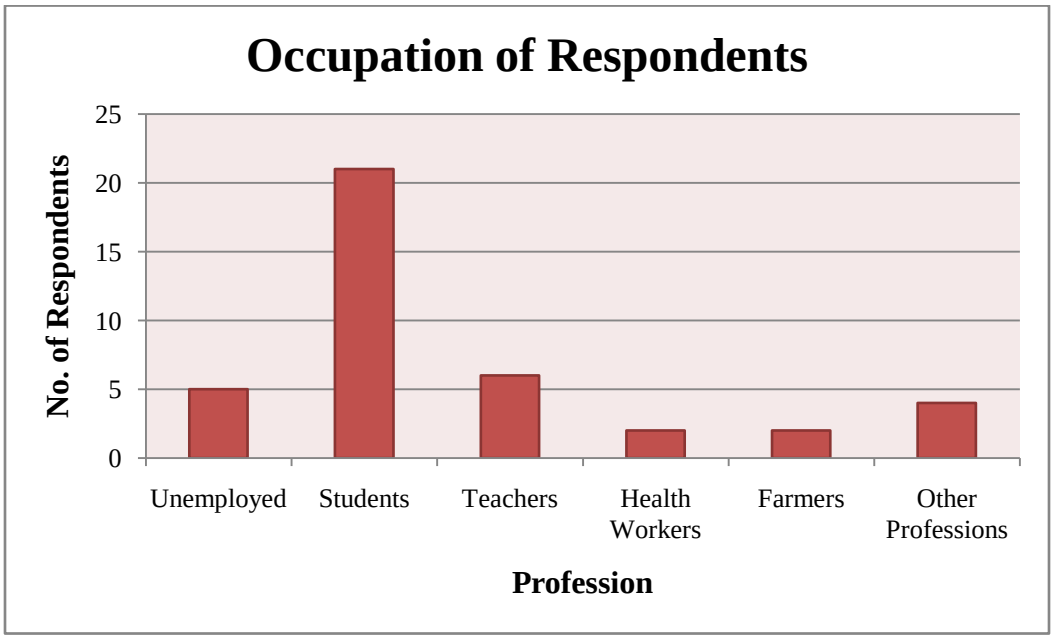


Figure 4.2: Distribution of Respondents by Occupation (n=40)

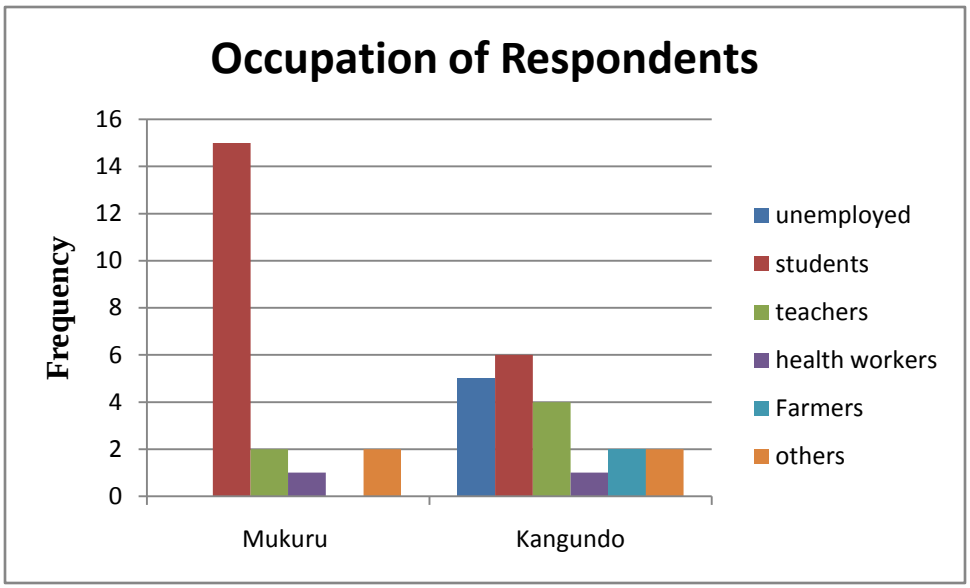


Figure. 4.3: Comparison of Kangundo and Mukuru by Occupation

It is obvious from finding, that the main digital village users are students, followed by teachers. Comparing the data on these groups shows that the percentage of students is higher in Mukuru than in Kangundo but the opposite is true with regard to teachers. This could be explained by the fact that most of the Mukuru digital village users are students at the educational centre where the digital village is located.

4.4 Information Needs Analysis

Users of digital villages expressed strong need for all categories of information with majority indicating the need for health information, academic information, agricultural information and local /international news. A few of the respondents indicated that they required political information.

Given that the respondents could indicate more than one type of information needed, overall one could say that all the categories of information were important to the users,

but with particular emphasis on health care and academic information. All respondents considered information to be important for their daily lives and their professional or economic activities, and that it should be made available in the digital villages.

The findings are in line with literature review which indicates that rural and disadvantaged communities in developing nations require information on health, agriculture, education, employment among others (Issa, 1998). The findings are also reinforced by the argument of Mulozi (2008) who revealed that telecentres have provided an opportunity to local farmers to access information that enable them to improve farm practices, market price information, linking agricultural products to market, and increase in income levels. According to Islam and Ahmed (2012) information needs of rural communities from all countries are very similar, although rural communities they do vary from region to region and from country to country depending on socio-economic conditions.

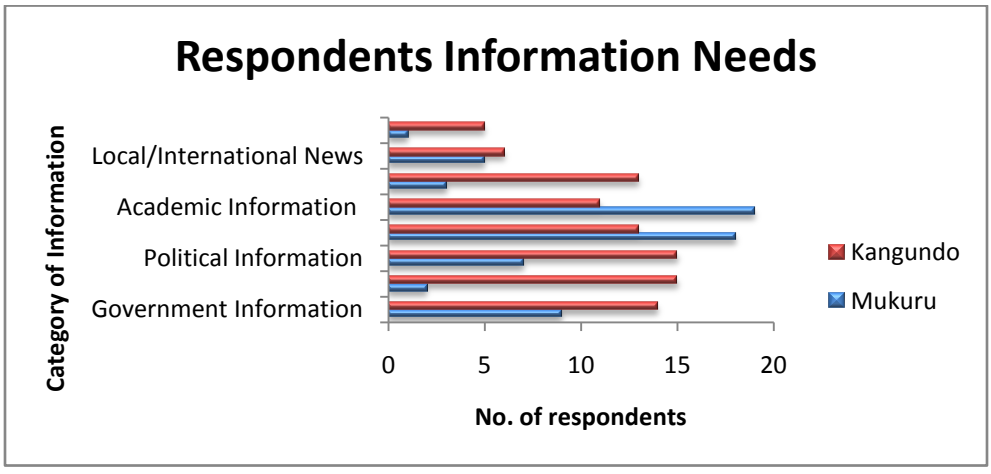


Figure 4.4: Information Needs of Digital Village Users (n=40)

Further analysis of the information needs showed that respondent's occupation, age, and level of education influenced the need for some types of information. For instance, it was found that all of the students and teachers included in the study needed academic information. It was also found that the farmers included in the sample needed agricultural information; health workers needed health information. On the other hand, all respondents with secondary, college and university level of education required health information.

4.5 Sources of Information

There were several sources of information used by people in the study area. The information sources used included radio, television, newspaper and magazines, government officials, face-to-face encounters, leaflets, libraries and the internet. The findings indicated that radio was the most commonly used source of information with majority of respondents reporting to having used it. Information was also sort from other sources that included: television, newspapers and magazines, leaflets and posters, Internet and libraries. It was found out that government officials' was the less consulted source of information with only a few of the respondents reporting to have used them to access information for their day to day life. The views agrees with the findings of the studies by Etta et al (2001), Mtega (2012) and zaid (2011) who identifies radio, televeison, Internet and libraries as major sources of information among rural communities.

The finding of the study has revealed that rural and disadvantaged communities need information to improve their knowledge and in making decisions that could improve their

quality of life. They therefore, try to meet their information needs by utilizing the information sources which are accessible to them and which they feel comfortable to use.

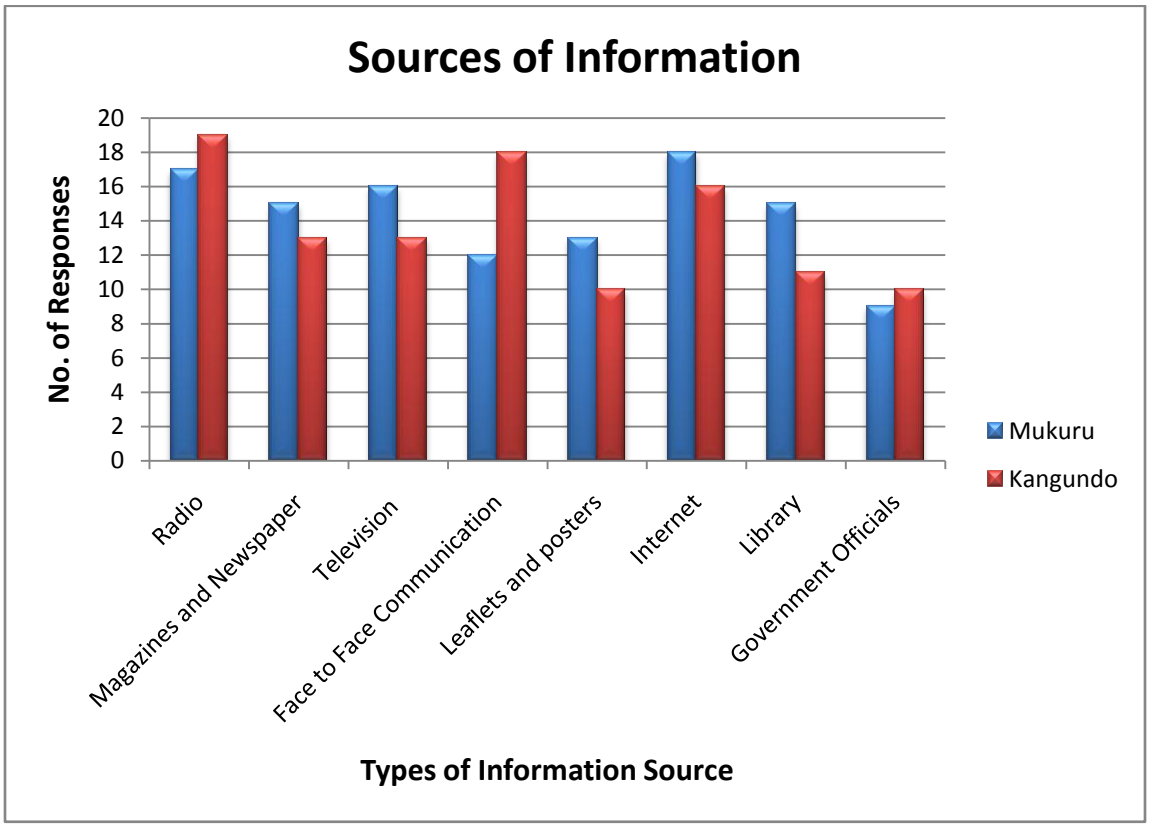


Figure 4.5: Sources of Information (n=40)

4.6 Services Offered at the Digital Villages

This section addresses the third objective on services offered in the digital villages. According to the ICT board, the objective of the project is to provide a suite of services to the public via computers connected to the internet. Although, the main objective of the digital villages was to provide internet services, there were other services being offered in the digital villages such as telephone services, photocopying services, printing and typing services and finally pasha portal services. Since the digital villages adopts a Government-

Franchise model whose broad purpose is both commercial and people oriented (Mukerji, 2008) the staff of the digital villages feels that the digital villages will not make any profit if they offer only internet services. The digital villages can therefore be categorized as basic telecentres based on the services they provide (Jensen and Esterhuysen, 2001).

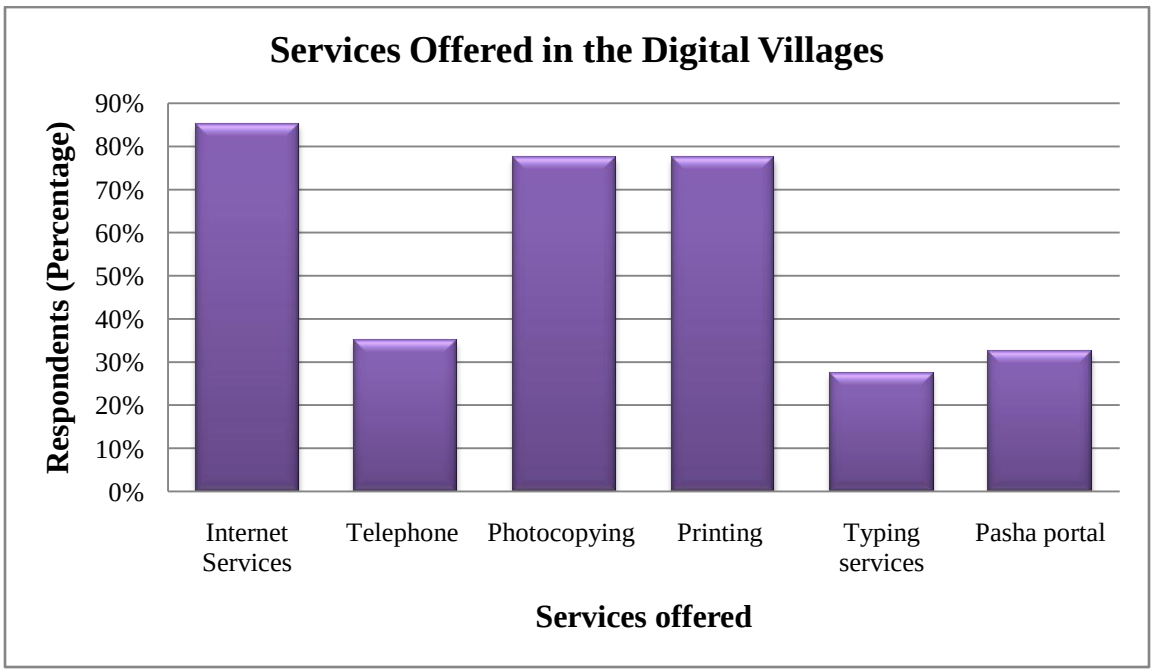


Figure 4.6: Overall Distribution of Services Used by Respondents (n=40)

Analysis of the services offered in the digital villages as shown in Figure 4.6 above shows that internet services is the most requested service by the users. This clearly shows that majority of users visit the digital villages to use internet services. The respondent agree that the digital villages have provided the communities with services associated with information and communication technologies (ICTs), such as e-mail and use of computers, at acceptable prices. It has also been possible to combine these with support services such as photocopies, and printing service for instance one user indicated that:

"I had come to search for police abstract form from the internet but I will also require it in hard copy for me to be able to fill"

The facilities used in telecentres play a major role in promoting community access to information for social activities, commercial/business growth, and research purposes (Fontaine, 2002).

4.6.1 Quality of Services Offered at the Digital Villages

The users were asked if the quality of services they are being offered meet their expectations. A summary of their responses is shown in table 4.5 below:

Table 4.5: Some of the Excerpt on the Quality of Services Offered in the Digital Villages

Response	Theme
You never come here for KRA pin and leave without...if you look at how clear there photocopy is, then you can only conclude that their services are excellent	Meet expectations
Although the Internet is sometimes very slow, generally I can say their services are good.	Partially Meets expectations
The services offered are good but there still room for improve especially support in the use of pasha services.	Partially Meets expectations
E-mail and Internet have enable the community to access varied information about what is going on in the world and Kenya in particular.	Meets expectations
The services does not meet my expectations as I expected better services than the normal cyber cafes but since I can transact my business no problem.	Doesn't meet expectations

4.6.2 Use of Internet Services in the Digital Villages

The question was in response to the fourth objective on the extent of use of digital villages to access information. According to ICT board, the objective of the project is to provide a suite of services to the public via computers connected to the internet. The study therefore attempted to find out how internet services are used to access information in the digital villages.

In the study, respondents were asked about their use of internet services in the Digital villages. Analysis show that 34 users reported to having used the Internet to access information. Of those who had used the internet services, they were further asked what they use internet services for and the results were summarized into five key areas which included: Education services, employment and entrepreneurship, health and wellness, social activities and e-government services.

Use of Internet services across the five areas varied considerably, ranging from a maximum of 22 users engaged in social activities to just 6 engaging in employment and entrepreneurial activities (Figure 4.7).

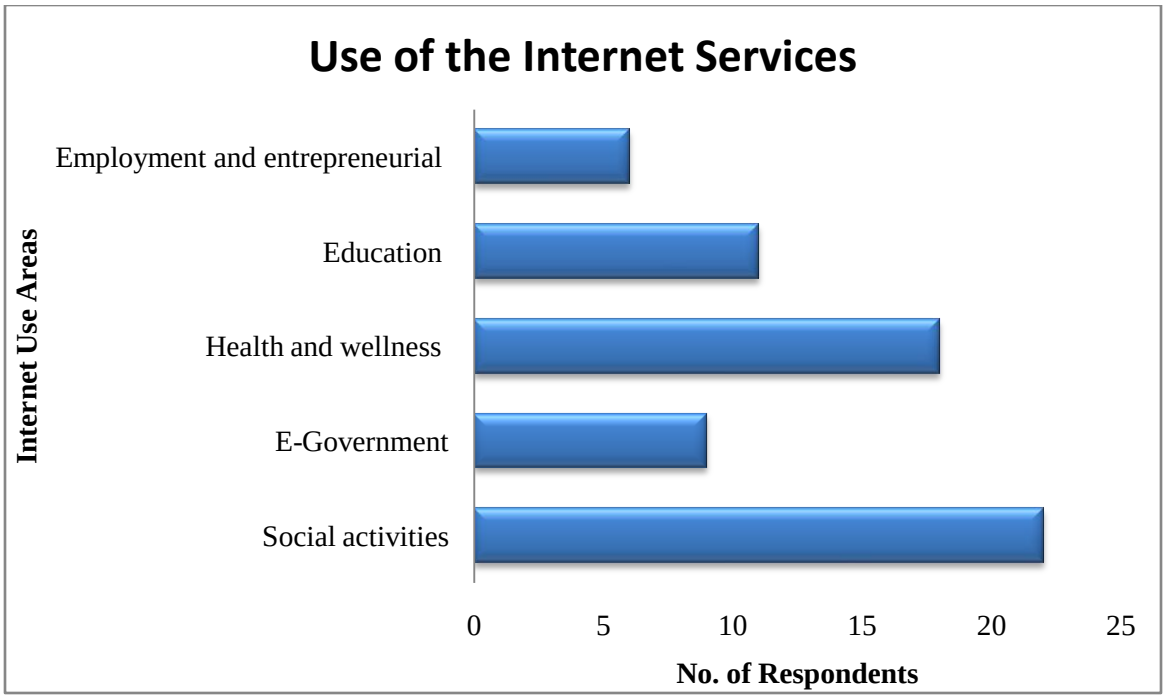


Figure 4.7: Uses of Internet Services in the Digital Villages (n=34)

The following sections examined specific activities associated with use in the areas described above, with discussion of the user characteristics most prominently associated with each activity.

a) Social Activities

By observations and interviews it was noted that social networking is what most customers do at the Digital Village. This is the culture that customers coming to the Digital Village center are accustomed to. Most of the users in this segment visited social network sites such as facebook, twitter and instagram in order to build social networks. The sites helped them get in touch with old friends or make new friends. One of Respondent notes that:

"I am here to catch up with friends in facebook and also see what is trending...I lost my smart phone, so this is the only place I can come to access social media (R_2*)"*

The researcher also confirmed through observation where at the time of research majority of the users could be seen logged into facebook and other social networks applications.

Communication with family and friends came out strongly in the research with some of the users communicating with friends and family through E-mail in order to maintain stronger family ties or find support for a personal issue. Respondent (R7) in his response to use of internet services to communicate with friends notes that:

"I use internet to communicate to my friends within the country and abroad through e-mail and chat. I have a relative in United States and we communicate through Email and sometimes through chat"

Lastly some of the respondents suggested a wide variety of entertainment and social uses for the internet services, including listening to music, downloading music to portable electronic music players where possible or watching videos on sites like YouTube.

b) Educational Use of Internet

Drawing from the National ICT policy of 2006, e-government strategy of 2003 and Sessional paper no. 1 of 2005, ICT integration in education is a key pillar in attaining socio-economic development in Kenya. ICT has improved the quality of education in Kenya by providing students and teacher's quality information materials. As earlier stated

most of the users of the digital villages were students and teachers of which some are pursuing their education. Analysis of the results shows that most of the users access the Internet to do their homework, learn about educational programmes, apply for financial aid (HELB loan) and lastly apply for programmes in institution of higher learning.

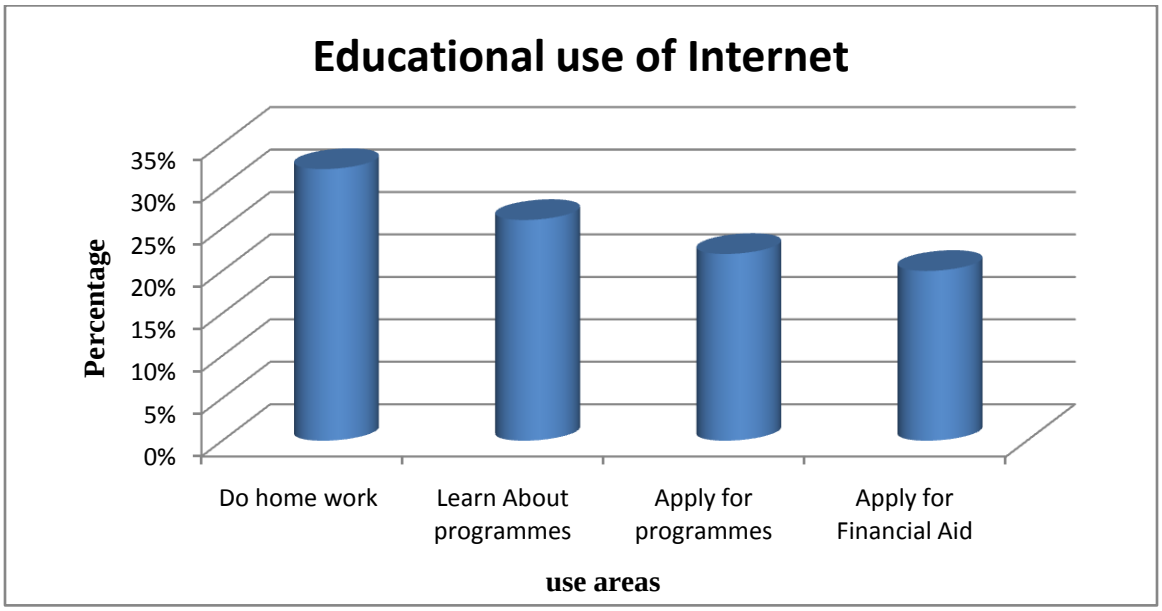


Figure 4.8: Education use of Internet

A first step in meeting educational needs for many users is learning about a program of study majority of Internet users who engaged in educational activities indicated that they used Internet to look for information on educational programs. The process of applying for college and other educational opportunities and obtaining financial aid has moved online along with many other educational activities in recent years as noted by one of the respondents:

> *"Last month I was here trying to revise the courses I had applied through JAB...nowadays everything is done online and today I am here trying to apply for HELB".(R16)*

Without access to the Internet, entry to the higher educational system can be a tedious and difficult, sometimes impossible, process. DV provide an important role in providing educational opportunities for many people in this area that's the reason over 50 percent of the Internet users engaged in educational activities use the internet for applying for programmes and financial aid. As noted by respondents (R11 and R12):

> *"Digital villages have provided me with opportunity to apply for scholarships and colleges abroad... I wish to get a chance to study abroad one day"*

c) Health and Wellness

The Kenyan government does not have any policy on E-health that can be used at the Digital Villages. According Kulecho (2012) there are no studies that have been conducted on E-health and digital villages. Most of the studies are on E-health systems that can be used in hospitals. Digital villages provide a means through which health information can be disseminated to the rural communities. According to Kangundo manager:

> *"The pasha portal has a lot of information on health especially on HIV/AIDS but most people looking for these information, access it directly through the Internet using Google search engines. There is need to create awareness to the people on the availability of health information in the pasha portal". (KM1)*

The study indicated that users of the digital villages used internet services to access health information. The respondents indicated that they accessed health information which ranged from information on Disease, illness, or medical condition; information about diet and nutrition; and information about health care providers and health

insurance. Majority of the users searched for exercise and fitness information. According to a user in Mukuru digital village;

> *"Information about diet and nutrition is important for girls as they like to maintain their bodies and keep fit." (R15)*

Another user in Kangundo digital villages, in response to the question notes that:

> *"There have been increase in the cases of cancer not only here in Kangundo but throughout the country, I therefore visit the digital villages to read more about the causes of cancer, prevention and treatment. It is always important to have that knowledge" (R3)*

d) E-government

The Kenyan Government recognises the importance of ICTs in facilitating service delivery. The Kenya vision 2030 identifies ICT as a key enabler of a globally competitive and prosperous nation. It envisages an information and knowledge based society by the year 2030. According to Waema and Mitulla (2011), the national ICT policy highlights the overall goal of e-government, which is to make the government more result oriented, efficient and citizen centred within the broader framework of IT, Broadcasting, Telecommunication and Postal Services, while on the other side, the e-government strategy aims to refine the relationship between the government and the citizens, with the objective of empowering them through increased and better access to public services.

The main aim of establishing digital villages across the country was to provide a suite of government programs and services to the local communities through the internet. The study showed that, users access the internet in the digital villages to find out about

government programmes and services, to download government forms and police abstracts, to find out about government permits and licenses while others used the internet to learn about laws and regulations especially on stating a business. According a respondent in Kangundo:

> *"The reason I am here today is to renew my driving license. The e-citizen platform has really made our work easier. There is no more travelling to Kenya Revenue authority offices to renew a driving license".* (R6)

e) Employment

According to Kenya National Bureau of Statistics (KNBS), unemployment rate in Kenya averaged 22.43 percent from 1999 until 2011. This is measured by the number of people actively looking for a job as a percentage of the labour force. This can be translated to mean that close to 10million people are looking for employment. On the other hand, prospective employers that include Government, Non Governmental Organizations and private sectors advertise job opportunities through their websites and in most cases encourage online job application. This has necessitated job seeks to Internet services in their search for employment.

Respondent (R12) in his response to the use of Internet services at the digital villages notes that:

> *"Access of daily newspaper is expensive for me since am still jobless and the fact most of the vacancies are advertised online, gives me the reason to visit the digital villages."(R12)*

Analysis of the study show that users visit digital villages to access information on employment or career opportunities. Specifically, they use Internet services to search for

job opportunities; submit job application online and to learn how to prepare their resumes. A user in Kangundo (R7) summed it up when he noted that:

> *"Walking around offices dropping your application is tiresome and you can easily give up, but in the Digital village, you can do what would take you a week to do in one day."(R7)*

4.6.3 Use of Pasha Portal in the Digital Villages

Digital villages were supposed to provide a suite of government information to the users through the pasha portal but from the findings, majority of the users were not aware of the existence of pasha portal in the centres. Only a few of the users were aware of the existence of the pasha portal.

The respondents were further asked the kind of information they have accessed from the pasha portal. From Table 4.6, a list of different types of information was mentioned including: Police abstract, Information how to apply KRA pin, application of Public service commission jobs, ministry of health programmes, and generally other government programmes.

Table 4.6: Information Accessed from the Pasha Portal

Type of Information	**Respondents (n=11)**
KRA pin application	4
Police abstract information	6
Ministry of health programmes	2
Application of PSC jobs	7
Government Information	5
NSSF Statements	1
HELB and government bursaries	3

Most of the users felt that the information they accessed from the pasha portal was relevant to their need because they had gone specifically to look for that information and the fact they got the information from the digital village they felt that their information need had been met.

4.7 Challenges Affecting Access to and use of Information in the Digital Villages

To get clear perspective on the challenges affecting use of information in the digital villages, the responses were analyzed under three major themes including financial challenges, technological challenges and social challenges. The results were summarized as follows:

Table 4.7: Challenges Affecting Access and use of Information in the Digital Villages

Key Challenges	Sample extracts	Specific challenges
Financial challenges	• The cost of accessing internet service is expensive for the locals. One Kenya shilling per minute is very expensive and again there is no difference with the local cyber cafes. • It is expensive to pay for utilities such as electricity, repay the loan from government and which makes it difficult make profit.	• Cost of services • Channelling of funds • Cost of utilities (staff, electricity)
Technological challenges	• Internet is sometimes very slow especially when you are downloading something. • Most users experience difficulty in searching for information in the internet	✓ Low bandwidth/slow connection ✓ Poor searching skills ✓ Power outages and blackouts
Social challenges	• Shortage of funds makes it very difficult for us to carry outreach and publicity programmes in order to create awareness among the community • People in the village are not aware of the existence of the digital village. Some confuse it with the normal cyber cafes around.	✓ Lack of awareness by community ✓ Lack of outreach and publicity ✓ Lack of local content ✓ Low level of education

Foley *et al*. (2002) in his study categorized challenges influencing the use of telecentres into socio-economic challenges and socio-personal challenges. The socio-economic challenges include low- income, low level of education and lack of technology skills, and socio-personal challenges such as low level of awareness, acceptance of ICTs usage, and language barrier. Other challenges that align with literature review include; literacy and level of education, language barriers, lack of awareness, and technological skills. In an effort to determine the strength of these challenges, the study came up with the frequencies with which the themes appeared in the responses. An in-depth analysis of the key themes is as follows:

4.7.1 Financial Factors

Financial factors affecting use of digital villages in accessing information include cost of services, channelling of funds by government and cost of utilities such as electricity, rent and staff. The major challenges the users were facing is cost of services. The cost of the services prohibited the users from utilizing the services fully. This challenge according to the managers of the DV was attributed to the high poverty level in community and the high cost of bandwidth.

Secondly, there was a major concern by the owners of the digital villages on how the funds were being channelled. The process of accessing the funds was taking long and being a loan that needs to be paid back, the service providers were left with little or no grace period to prepare for repayment. This has led to the services being charged higher than the expected prices as was expressed by the users as their biggest issue.

Lastly, the cost of utilities has skyrocketed according to the managers of the digital villages. The cost of renting space, electricity and payment of salaries for support staff was very expensive and thus affect the costing of the services in the digital villages.

4.7.2 Technological Factors

When ICTs are present, some members of any population demonstrate a reluctance to use that technology. They may be anxious or they may be fearful about the new technology, and that technophobia raises a barrier to broader use of ICTs. Issues such as poor information searching skills, power surges and blackouts, low bandwidth or slow connection come out as some of the technological factors affecting access to information in the digital villages.

4.7.3 Social Factors

The literacy and levels of education is the most concern within the rural communities as revealed in the findings of the study to be the most challenge to the use of Digital Villages to access information. Majority of the users were of the view that low level of education and literacy in the community was the major issue for not using digital villages. This can be attributed to the fact that majority of the people in rural areas do not know how to read and write especially adult people and this affect the use of pasha centre facilities. The Manager of Kangundo digital village notes that *"...Illiteracy and low levels of educational attainment can hinder many rural people from using, or even visiting the telecentre, unless measures are put in place to take care of both literate and illiterates".(KM1)*

The awareness and existence of Digital village's services are important to rural communities when used effectively. Nevertheless, the study findings identified lack of awareness as another challenge that influences the use of Digital Villages to access information. The findings of the study revealed that local communities are not aware of the existence of the Centres and the services they offer.

From the research, it came-out clearly that lack of outreach and publicity is a major challenge affecting use of the digital villages. Managers and staff of the digital villages admitted to the fact that they have not carried any publicity of outreach programme in order to create awareness of the existence of the digital village. A manager in Kangundo noted that

> "*Shortage of funds makes it very difficult to carry out publicity and outreach programmes."(KM1)*

According to the Directorate of ICT board in charge of digital villages, some of the challenges affecting implementation of Project include:

- Internet connectivity is expensive in rural areas for example; it is approximately three times higher in Kangundo than Nairobi.
- Power failures are regular
- Low business plan submission rate
- Profitability is inconsistent among pilot Pashas
- Gap between available funds and entrepreneurs awareness of program/funding
- Entrepreneurship training is effective, but more enablement services are needed. Reliable and sustainable enablement platform between entrepreneurs is needed

- Willingness of Consumers to Utilize Services
- ICT literacy rate is low (~30% of population). ICT literacy must be a priority to foster adoption and usage of DVs and ensure viability and success
- Computers are generally viewed by local constituents as tools only for the university educated
- Basic needs (food/water/shelter) must be met before introducing computers. ICT usage must provide a clear and present benefit to citizens in order to be adopted by the majority
- National level programs tend to have high awareness rate, but complete communication plans reaching to all citizens are lacking

To address the above challenges the directorate suggested the following measures:

- Assess existing infrastructure to better understand affordability, reliability, and speed
- Re-evaluate contracts with ISPs and network providers with a goal of providing affordable and reliable service
- Re-open the application process for KICTB Entrepreneurship Training and set a minimum level of ICT skill requirement in order to apply. This will help increase the number of viable business plans submitted by potential entrepreneurs
- Incorporate ICT training into primary education curriculum
- Create local content development plan in support of local content needs
- Create comprehensive communication plan focused at reaching grass roots level

4.8 Chapter Summary

In this chapter, the researcher has given meaning to the primary data collected from the field through interviews, observation and documentary analysis as elucidated in chapter three. The data was sorted in relation to the key themes and categories. Each set of data was presented, analyzed and interpreted separately; this was done with the realization that as each set of data is presented, it becomes much easier to analyze and interpret it at the same time. Finally, since the study was based on qualitative research approach, the meanings derived from the findings were generally qualitative.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of major findings, conclusions and recommendations. It relies particularly on the details of the findings and analysis in chapter four. The summary was guided by the objectives of the study while the conclusion and recommendations was based on the findings of the research.

5.2 Summary of Major Findings

The aim of the study was to investigate access to and use information in Mukuru and Kangundo digital villages by local communities. To achieve this, the study was focused on the following specific objectives:

i. To examine the information needs of the communities served by Kangundo and Mukuru digital villages.
ii. To examine the sources used by the communities in Mukuru and Kangundo to access information
iii. To find out the extent to which Mukuru and Kangundo digital villages are used by the communities to access information.
iv. To explore the factors affecting the use and access information in the Mukuru and Kangundo digital villages

To achieve the above objectives, data was collected from various stakeholders of the digital villages' project. They included Users, managers of the digital villages, staff

members and the directorate of the digital village project at ICT board. In total 50 respondents were selected to participate in the study. They included 40 users, 2 managers, 7 staff members and 1 member from the directorate of digital village. All the respondents in the study were selected using purposive sampling technique. Questionnaires were highly responded to, with the research benefiting from 100% response rate.

5.2.1 Information Needs

In this section the study addressed the first objective: to examine the information needs of the communities served by Kangundo and Mukuru digital villages. The findings of the study revealed that communities in Mukuru and Kangundo would like to have all kinds of information ranging from agricultural, academic, health, political, market and government information. Overall one could say that all the categories proposed were important to the users, but with particular emphasis on health care and academic information. All respondents consider the information to be important for their daily lives, professional or economic activities, and that it should be made available in the Digital Villages. The results of the study agrees with Mtega (2012) who notes that people have specific needs which relate to the specific problems they face and the decision they have to make.

5.2.2 Sources of Information

The sources of information for users of Kangundo and Mukuru digital villages were many and varied. The main sources of information used included radio, television, newspaper and magazines, government officials, face-to-face encounters, leaflets, libraries and the internet. Radio was the most used source of information with 89% of respondents having used it to access information. This can be attributed to the high

number of radio stations in the area of study as compared to one digital village with poor infrastructure. This findings aligns with a study conducted by Etta et al (2001) on information communication technology in Kenya; the study mentions Radio, television, newspaper, cell phones, leaflets, face-face encounters and Internet as some of the common media used by local communities to access information.

5.2.3 Use of Digital Villages to Access Information

A key issue in this study was to find out the extent to which Mukuru and Kangundo digital villages were being used to access information. Previous research examining community based ICT projects has been concerned with the sustainability of the projects and leaving out the aspect of information access and use. This study therefore tried to address this gap by examining digital villages primarily from the viewpoint of access and use. Among the key findings was lack of awareness of the existence of the pasha portal in the digital villages; low usage of pasha portal to access information. According to the research, users of the digital villages used Internet service for the following purposes:

i) Social Connections

Computers and the Internet have radically changed how people communicate and socialize with one another, express themselves, and seek help for problems. Social activities are an important component of many users' interaction with Internet services. The finding revealed that, users accessed Internet services in the digital villages in order to connect with friends and relatives find support for a problem or concern or enjoy other social activities. Some of the Internet services used for social connection included e-mail, social media such as facebook and twitter.

ii) Education

The internet and generally computers have greatly integrated with our education system such that they have become part and parcel of everyday learning. The findings have revealed that users visited Digital Villages to seek for information which assist them in doing their assignment, learn about educational programmes, apply for financial aid (HELB loan) and lastly apply for programmes in institution of higher learning. The findings align with Gómez & Ospina (2001) who concludes that telecentres offers students and the general public a source of information for doing research and also facilitate the learning process. He further says that students always visit telecentre to do school assignments.

iii) Employment

The findings of the study have revealed that digital villages have provided an opportunity for unemployed to access information on job opportunities, submit job application online and learn some skills on how to prepare their resumes. These findings align with the study conducted by Buhigiro (2012) on the role of telecentres in promoting socio-economic development in Rwanda which indicated that ICT applications have been instrumental in providing access to jobs opportunities, education and training, and information related to economic activities.

iv) Health and Wellness

The findings revealed that Digital villages have provided opportunities to local communities to have access to information on diseases such as HIV/AIDS and malaria. Having such information helps the local communities to prevent such diseases. The

findings also revealed that local communities are concerned with their wellbeing. They visit Digital Villages to learn about medical conditions, diet and nutrition, health care providers, and assess health insurance options. The finding is supported by a study conducted by Kulecho (2012) on the use of Digital Villages to promote E-Health education and information. She is of the opinion that digital villages have a potential to provide cheap, effective and efficient means of distributing e-health information to the local communities.

v) E-Government

The main aim of establishing digital villages across the country was to provide a suite of government programs and services to the local communities. The e-government strategy aims to refine the relationship between the government and the citizens, with the objective of empowering them through increased and better access to public services. The findings of the study indicate that digital villages have provided opportunity for local communities to learn about government programmes and services, to download government forms and police abstracts, to find out about government permits and licenses and lastly to learn laws and regulations related to stating a business.

5.2.4 To Explore Challenges Affecting Access and Use of Information in Digital Villages

The findings from the study reveal a number of challenges affecting access and use of information in digital villages. These challenges were categorized into financial challenges, technological and socio-personal challenges. The financial challenges include cost of services, cost of utilities and the process of access funding for the project. On the other hand, technological challenges include lack of technology skills and low

connectivity/bandwidth thus slowing access to the internet. Lastly, social challenges such as low level of education, low level of awareness, and lack of local content come out as major issues hindering access to information in the digital villages.

5.3 Conclusion

This study attempted to investigate the extent to which digital villages were being used by local communities to access information. The study examined access to and use of information in Mukuru and Kangundo digital villages by identifying information needs of users and factors affecting access and use of digital villages. These informed the recommendations made and the proposed framework.

Digital Villages' Project is anchored in Kenya Vision 2030 and the ICT strategy of 2006 in which the Government hopes to achieve an information-based society by harnessing the use of ICT in provision information. The government intended to have digital villages in rural areas and disadvantaged urban areas from which local communities can access information. The idea behind the DV project was noble but it has failed to meet the expectations, the findings of the study confirm that the level of use of the studied Digital villages to access information was very low (20% of users) despite the limited access to information faced by the local communities.

When ICTs are present, some members of any population demonstrate a reluctance to use that technology. They may be anxious or they may be fearful about the new technology, and that technophobia raises a barrier to broader use of ICTs. This is true with the digital villages as confirmed by the study whereby 39.6% of the respondents believed that technological challenges affect the use of digital villages. Other social factors like lack of

awareness, low level of education and illiteracy also influence the use of the Digital villages. Creating of awareness is paramount for the success of any project.

The study findings further indicated that digital villages offer a variety of services to local communities which have created opportunities and benefits such as computer knowledge skills, job creation, increased income, study opportunities, and access to information in areas of education, health, agriculture market prices, and government information. However, there are several factors affecting use of digital villages such as financial challenges, technological challenges and social challenges that need to be addressed. The study shows that, high cost of using the Internet compounded by the high poverty level of the local community affects the use of digital villages. Very few people can afford to use the Digital villages mostly due to large service fee associated.

So as to meet their objectives, digital villages should provide information relevant to people's need. Information packages should be in different formats that different groups of information seekers can be able to access information. As different information seekers prefer different information services, the number of information services provided should base on user preference, moreover; user fee should be relevant to the average income of the digital villages' users, this can optimize the use of information services by a majority of farmers who are financially poor, an equal importance towards an information rich society.

5.4 Recommendations

To enable digital villages in Kenya meet their objectives better, the following recommendations are suggested:

1. **Improving quality of Services;** The Government through the ICT authority should increase the Internet broadband for the digital villages. This will increase the speed of internet services and thus the Quality. The Digital village managers should strive to provide a variety of services among users. This will help to attract many users and provide opportunities to earn more income that can in turn be used to expand the services. For better performance of digital villages, the quality existing services provided should be improved so as to distinguish it from the local cyber cafes.
2. **Location of digital villages;** Since digital villages are meant for provision of information services in rural and marginalized areas, it is expected that they are located in relevant areas. Location consideration is important for digital villages to meet their objectives. Some of digital villages in Kenya are not located in rural areas per se; they are located in areas with many alternative information sources for instance Kangundo digital village is located Kangundo town. The ICT authority should ensure that digital villages are located in appropriate areas.
3. **Improved Marketing of services;** Digital villages owners should strive to market their services strongly to create awareness to as many people in the community as possible so as to improve the feasibility of their services. The Government should encourage entrepreneurs to open more digital villages in rural areas for easy accessibility by the community and reduce distance customers travel to access ICT services. If possible the existing digital villages should form a consortium to increase their lobbying capacity.
4. **Collaboration with institutions;** The Government should come up with policies that will foster collaboration between the digital villages and government institutions such

as Kenya Agricultural Research institute(KARI), ICIPE, education Institutions such as universities among others to generate local content. Digital villages will be enriched with local content that will be helpful and meet the needs of local communities.

5. **Properly resources co-ordination:** The government should change its approach in channeling funds, connecting internet in the rural areas and encourage more entrepreneurs to open more digital villages in the rural areas by reducing taxes on computers and other infrastructures. Although government has released funds for the digital villages' project, the owners of digital villages are finding it difficult to access these funds. The Banks which were given the money to distribute have put unfavourable conditions for the entrepreneurs to access the funds (see 4.7.4).
6. **Content production:** There is need for the government and the ICT Authority to develop local content, services and solutions that cater for the local needs and requirements of the communities. This can be done through collaboration of Government departments and digital villages. Failure by digital villages to meet expectations can be attributed to the fact that most of them provide content or services that does not meet the needs of the local communities.
7. Lastly, lack of basic amenities such as electricity and Internet connection makes it very difficult to operate a digital village in the rural areas. The ICT authority should consider starting a mobile digital village because of its ability to reach a wide area and serve more people.

5.5 Proposed Framework for Improving Access to Information in the Digital Villages

A key objective of the study was to provide a framework that will help improve access to information in the digital villages. Key issues affecting access and use of information emerged during the study which informed the framework proposed by the researcher. The framework presented below was developed from the views and experiences of a small group of users and consequently does not aim to be comprehensive. The intention is that this framework be seen as a starting point when considering future development of digital villages because it is based on the experiences and views of users and the people who work in the digital villages.

The research framework is based on four key elements; collaboration, Local content, branding of Digital Villages and publicity and outreach programmes. These elements formed the basis in which the framework was developed.

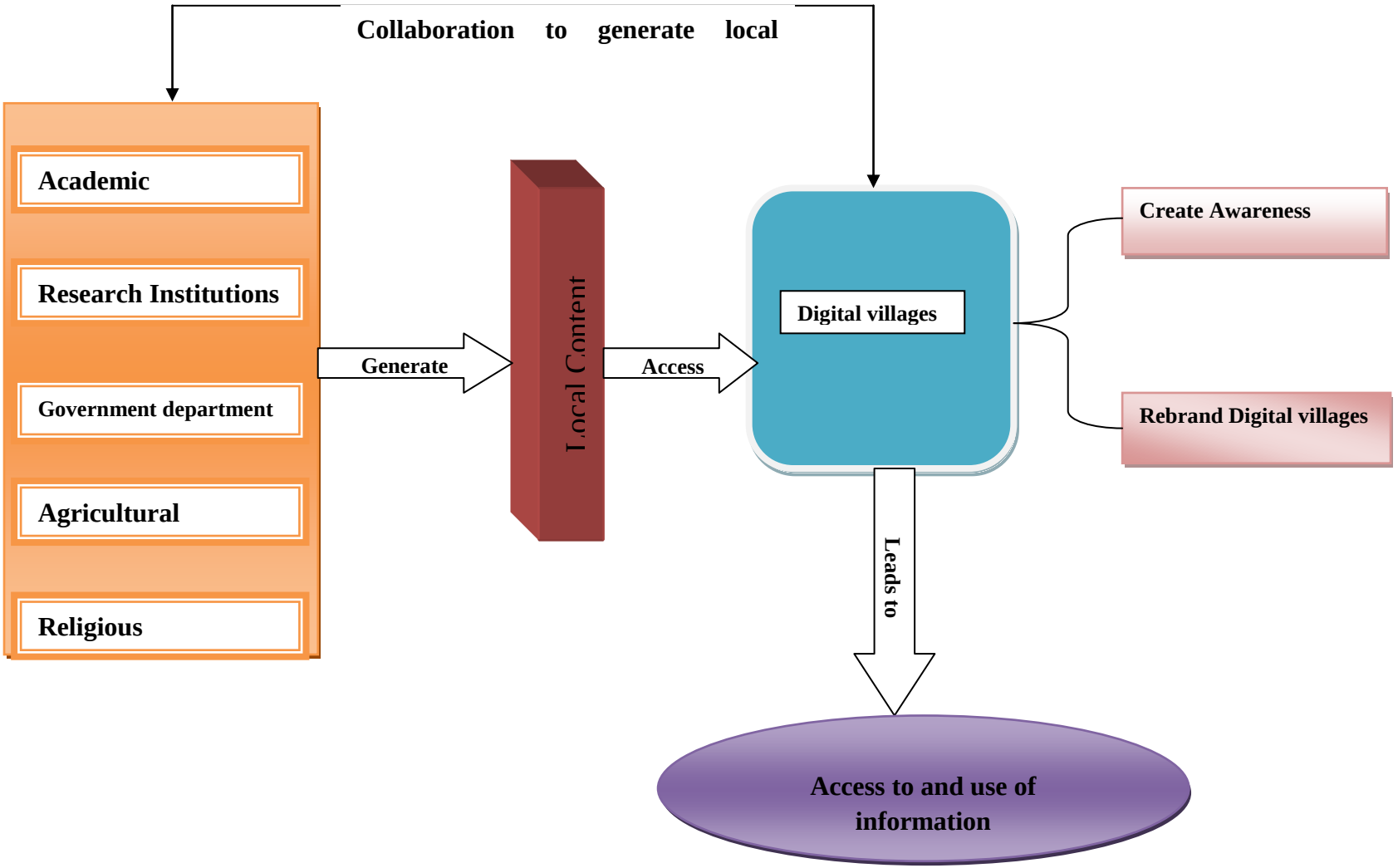


Figure 5.1: Proposed Model for Information Access in Digital Villages

Collaboration; There is a lot of information being generated by the academic institution, research organizations, agricultural institutions and government departments that is required by the local communities in their day to day life. Through cooperation and collaboration between these institutions and the digital villages' project secretariat, digital villages can be used to disseminate this information thus creating an informed society.

Local Content; one significant reason as to why some groups chose not access information from the digital village is because the content is not relevant to their needs. Local content is information provided locally and reflects the values, lifestyle and the needs of local community. Lack of local content on the internet increases unpopularity of digital villages among the local community. It is therefore important for digital villages to provide Local content that can satisfy the needs of the locals. This can be achieved by collaboration with local institutions as explained above.

Publicity and Outreach Programmes: The community needs to be made aware of the existence of these Centres and the services they offer. Lack of awareness came out strongly as one of the challenge faced in access and use of digital villages. It is also evident that most people still visit government offices for services that can easily be accessed through the Centres.

Rebranding of Digital Villages; Rebranding will enable the local community differentiate between Digital Villages and other centres providing ICT services in the community such as cyber cafes. The cost of services in the digital villages should be reasonable so as to encourage the local community to access information from these centres. The services offered should also be unique in the sense that, digital village

should offer services that are not offered by other ICT centres. Services such as e-government and agricultural information services should be synonymous with the digital villages.

5.6 Suggestions for Further Research

The research study was limited to the users of digital villages and the challenges they face in accessing information in the digital villages. Further research is required to establish the views of both users and non users of digital villages on issues related to information access. The results of the study led to development of a framework to inform future community based ICT initiatives and being a proposed framework, the research suggests that future studies be conducted to determine its suitability.

REFERENCES

Abend, G. (2013) "The Meaning of Theory." *Sociological Theory* 26 (June 2008): 173–199; Swanson, Richard A. *Theory Building in Applied Disciplines*. San Francisco, CA: Berrett-Koehler Publishers 2013.

Akanda, A.K.M. and Roknuzzaman, Md. (2013). Rural Information Provision in Bangladesh: A Study on Development Research Network: Journal of Information and Knowledge Management, Vol.3, No.10, 2013.

Akther, F. (2012). Rural Community Development Strategy beyond the Access to Information: the Role of Tele-centers in Bangladesh. IADIS INTERNATIONAL CONFERENCE e-Society 2012. Available at http://vbn.aau.dk/en/publications/rural-community-development-strategy-beyond-the-access-to-information(00090458-52d7-42f7-a5ac-3f2f7e19e841).html

Akinsola, O., Herselman, M., & Jacobs, S. (2005). ICT provision to disadvantaged urban communities: A study in South Africa and Nigeria, International Journal of Education and Development using Information and Communication Technology, 1, 3, 19-41. APEC Economic Committee (2000), towards knowledge-based economies in APEC. Retrieved on 5/6/2013 from: http://www.cherry.gatech.edu/myketeam/documents/refs/Towards%20Knowledge based%20Economies%20in%20APEC.pdf

Ariyabandu, R. (2009*). Role of Telecentres as Knowledge Networks: Successes and Challenges*: ESCAP Technical Paper. Retrieved on 28/6/2012 from: http://www.unescap.org/idd/working%20papers/IDD_TP_09_06_of_WP_7_2_905.pdf

Atieno, L. V., & Moturi, C. A. (2013). Implementation of Digital Village Projects in Developing Countries-Case of Kenya. British Journal of Applied Science & Technology, 4(5).

Ballantyne, P. (2002), Collecting and Propagating Local Development Content. Retrieved on 23/2/2015 from: http://www.ftpiicd.org/files/research/reports/report7.pdf

Benjamin, P. (2001). Does 'Telecentre' mean the centre is far away? Telecentres development in South Africa. The Southern African Journal of Information and Communication, Vol 1, No 1, 2001. Available at: http://wiredspace.wits.ac.za/bitstream/handle/10539/19843/SAJIC-Issue-1-2000-Benjamin.pdf

Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational Researcher, 34(6), 3-15.

Borgman, C.L. (2000). From Gutenberg to the global information infrastructure: access to information in the networked world. Cambridge: MIT Press.

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology 3 (2). pp. 77-101. Retrieved on 3/4/2014 from: http://eprints.uwe.ac.uk/11735/2/thematic_analysis_revised.

Brink H.I.L. (1993). Validity and Reliability in Qualitative Research. Retrieved on 23/07/2014 from www.curationis.org.za/index.php/curationis/article/download/.../1350

Bruegge, C. (2011), "Measuring Digital Local Content", OECD Digital Economy Papers, No. 188, OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/5kg0s294n9kf-en

Buhigiro, S. (2012). The Role of Telecentres in Promoting Socio-Economic Development in Rwanda, A research report. Retrieved on 5/6/2014 from: http://wiredspace.wits.ac.za/bitstream/handle/10539/12464/BUHIGIRO%20Seth%20-Research%20Report-Final%20300412.pdf?sequence=1

Bush T. (2007). Authenticity in research – reliability, validity and triangulation. In *Research Methods in Educational Leadership and Management*. Retrieved on3/4/2014 from http://pebblepad.wlv.ac.uk/viewasset.aspx?oid=103268&type=webfolio...

Clark, J. (2001). "Promoting Participation in Telecentres," *The Journal for Development Communication, 12,* 2. Retrieved on 23/6/2013 from: http://telecentres.isoc.am/references/info/jdc-clark.doc

Cohen L., Manion L. & Morrison K. (2000). Research Methods in Education (5th Edition), Routledge Falmer,

Cohen, D, & Crabtree, B. (2006). "Qualitative Research Guidelines Project." Available at: http://www.qualres.org/HomeRand-3812.html

Condelli, L., & Wrigley, H. (2004). Real World Research: Combining Qualitative and Quantitative Research for Adult ESL. Available at: https://lincs.ed.gov/sites/default/files/lincs/discussions/list.../RealWorldResearch.doc

Conradie, D.P. (1998). Using information and communication technologies (ICTs) for development at centres in rural communities: Lessons learned. *Communicare, 7*, 1, 97-116.

Creswell, J. W. (2002). Research design: Qualitative, quantitative and mixed methods approach (2nd ed.). Thousand Oaks, CA: Sage.

Crofts, J., Hungria, S., and Monfries, J. (2011) Theoretical paradigms: positivism, feminism and interpretivism. Available at: http://dbdaishu.com/blog/?p=238/

Denzin, N. K., & Lincoln, Y. S. (2000). *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Dervin, B. (1992). *From the mind's eye of the user: The sense-making qualitative and quantitative methodology*. In J. Glazier and R. Powell (eds.), Qualitative Research in Information Management pp. (61-84). Englewood: Libraries Unlimited.

Digital villages project (DVP). Retrieved on 14/5/2012 from: http://www.ict.go.ke/index.php/digitalinclusion/pasha

Ellen, D. (2000). *Telecentres and the provision of community based access to electronic information in everyday life* (Doctoral dissertation,: Manchester Metropolitan University, UK). Retrieved on 28/6/2012 from http://scholar.google.co.za/scholar?start=0&hl=en&as_sdt=0,5&cluster=39797440494717309

Ellen, D. (2003). *Telecenters and the provision of community based access to electronic information in everyday life in the UK*. Retrieved on 28/6/2012 from: http://informationr.net/ir/8-2/paper146.html

Etta, F., Agonga, A. and Katia, S. (2001). *ACACIA in Kenya: a study of information and communication technologies &community development*. Retrieved on 25/3/2013 from:http://www.idrc.ca.uploads/user-S/10342620740ict-cbd_kenya-final_report.pdf

Falch, A., & Anyimadu, A. (2003). Tele-centre as a way of achieving universal access – the case of Ghana. Retrieved on 12/6/2014 from: http://portal.unesco.org/ci/en/files/15648/10835959551Universal_Access_in_Ghana.pdf/Universal%2BAccess%2Bin%2BGhana.pdf

Foley, P., Alfonso, X., & Ghani, S. (2002). The Digital Divide in a World City. Retrieved on 19/7/2012 from: http://www.citizensonline.org.uk/site/media/documents/923_GLA%20The%20Digital%20Divide%20in%20a%20World%20City%20June%202002.pdf

Fontaine, M. (2002). Community Telecentres: Enabling lifelong Learning. In W.D. Haddad, A. Draxler (Ed.), *Technologies for education: potential and prospects.* (pp. 159-163). Paris, Washington: UNESCO and AED. Retrieved on 15/8/2013 from: http://www.ictinedtoolkit.org/usere/library/tech_for_ed_chapters/12.pdf

Gigler, B. (2004). Including the excluded—Can ICTs empower poor communities? Towards an alternative evaluation framework based on the capability approach. Paper presented at the Fourth International Conference on the Capability Approach, Pavia, Italy. Available at http://www.its.caltech.edu/~e105/readings/ICT-poor.pdf

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597-606. Retrieved 3/4/2014, from http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdfGómez, R.& Hunt, P. (1999). *Telecenter Evaluation: A Global Perspective*. International Development Research Centre (IDRC), Ottawa. Retrieved on 15/4/2014 from: www.idrc.ca/telecentre/evaluation/html/06_Tel.html

Gómez, R., & Ospina, A. (2001). "The Lamp without a Genie: Using Telecentres for Development without expecting miracles", *Journal of Development Communication, 12*, 2.

Hallberg, D., Kulecho, M., Kulecho, A. & Okoth, L. (2011). Case studies of Kenyan digital villages with a focus on women and girls. *Journal of Language, Technology & Entrepreneurship in Africa Vol. 3 No. 1.* Available at: https://www.ajol.info/index.php/jolte/article/download/66724/54610

Haralambos, M. and Holborn, M. (2004): Sociology - Themes and Perspectives. Collins Education, London.

Hardon, A., Hodgin, C. & Fresle, D. (2004). How to Investigate the Use of Medicines by Consumers: World Health Organization and University of Amsterdam. Retrieved on 23/4/2015 from: http://apps.who.int/medicinedocs/en/d/Js6169e/

Heeks, R. (1999). Information and Communication Technologies, Poverty and Development, Development Informatics, Working Paper Series, paper no. 5: Institute for Development Policy and Management; University of Manchester, Precinct Centre, Manchester. Retrieved on 20/2/2015 from: http://www.man.ac.uk/idpm/idpm_dp.htm#devinf_wp

Heeks, R. (2005). Foundation of ICTs in Development: The information chain. *E-Development Briefing*, Vol. 3, No. 1, pp. 1-2. Retrieved on 20/2/2015 from: http://www.seed.manchester.ac.uk/medialibrary/IDPM/working_papers/di/dig_briefing/DIGBriefing3Chain.pdf

Heeks, R. (2008). ICT4D 2.0: The Next Phase of Applying ICT for International Development. *Computer*, Vol. 4, No. 6, pp. 26-33. Available at: http://www.seed.manchester.ac.uk/medialibrary/IDPM/working_papers/

Hellström, J. (2003). Bridging the Digital Divide? Self-Manage IT – A Ugandan Case Study; Master Thesis in Informatics, School of Economics and Commercial Law, Göteborg University. Retrieved on 30/3/2015 from: https://gupea.ub.gu.se/bitstream/2077/1106/1/Nr_6_JH.pdf

Henning, E., Gravette, S. & Rensburg, W. (2004). *Finding your way in qualitative research*. Van Schaik Publications, Pretoria.

Hunt, P. (2001). True Stories: Telecentres in Latin America & the Caribbean. Electronic Journal on Information Systems in Developing Countries, 4, 5, 1-17.

Islam, M. S. and Ahmed, S.M. Z. (2012). The information needs and information-seeking behaviour of rural dwellersA review of research, *IFLA Journal June 2012 vol. 38 no. 2 137-147.* Retrieved on at: http://ifl.sagepub.com/content/38/2/137

Issa, A.O. (1998). The information needs of rural dwellers in Kwara State. In Tijiani, A. et al (ed.). *Issues in information provision. Nigerian perspectives.* Zaria: Naliss. Retrieved on 29/06/2013 from http://informationr.net/ir/8-2/paper146.html

ITU (2011). Report on measurement of information society. Available at: *https://www.itu.int/ITU-D/ict/publications/idi/.../2011/MIS_2011_without_annex_5.pdf*

Jensen, M. and Esterhuysen, A. (2001). *The community telecentre cookbook for Africa: Recipes for self-sustainability: How to establish a multi-purpose community telecentre in Africa:* Available online at: http://unesdoc.unesco.org/images/0012/001230/123004e.pdf

Joppe, M. (2000). *The Research Process.* Retrieved June 2, 2013, from http://www.ryerson.ca/~mjoppe/rp.htm

Kakulu, I.I. (2014). Qualitative Research Strategies and Data Analysis Methods in Real Estate Research - An innovative approach using the BB Model. Available at https://www.researchgate.net/publication/262065420

Kamba M.A. (2009). *Access to information: the dilemma for rural community: Development in Africa*: Retrieved on 17/10/2013 from: http://smartech.gatech.edu/jspui/bitstream/1853/36694/1/1238296264_MA.pdf

Kenya ICT Board (2010). About us. Available at: http://www.ict.go.ke/index.php/theboard.

Kothari, C. R. (2004) *Research Methodology: Methods and Techniques.* New Delhi: New Age International (p) Limited Publishers.

Kulecho M. (2012). Kenya Government E - Initiatives: The use of Digital Villages to promote E Health education and information. *Jönköping International Business school.* Retrieved on 2/5/2013 from http://www.diva-portal.org/smash/get/diva2:612649/ATTACHMENT01.pdf

Kwigizile, E. Chilongola, J., and Msuya, J. (2011). The impact of road accessibility of rural villages on recognition of poverty reduction opportunities. *African Journal of Marketing Management* Vol. 3(2), pp. 22-31. http://www.academicjournals.org/ajmm/PDF/pdf2011/Feb/Kwigizile%20et%20al.pdf

Mason, M. (2010). Sample Size and Saturation in PhD Studies Using Qualitative Interviews. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 11*(3). Retrieved from http://www.qualitative-research.net/index.php/fqs/article/view/1428/3027.

Mayoux, L. (2012). Quantitative, qualitative or participatory? Retrieved on 3/2/2015 from www.cbs.dk/.../qualitative-methods-in-development

McKenzie, K., & Danforth, S. (2009). Problem Definition, Exploratory Research, and the Research Process. Decision Analyst, Inc. Proposal to Conduct a Brand Equity Study. Fun City Gaming, Inc.

McMillan, J. H., & Schumacher, S (2006). *Research in education: Evidence-based inquiry*. (6th ed.). Boston: Pearson education.

McNamara, Carter (1999). General Guidelines for conducting Interviews. Available online at: http://managementhelp.org/businessresearch/interviews.htm

Merriam, S.B.(1998). Qualitative research and case study applications in education. San Francisco: Jossey-Bass Mills, G. E. (2003). Action Research. A Guide for the Teacher Research. (2nd ed.). NewJersey: Merrill Prentice Hall

Molnar, S. and Karvalics, L.Z. (2001). Two Models and Six Types of the Telecentres: A Typological Experiment. Available at www.ittk.hu/english/docs/two_models_six_type.pdf.

Mtega W.P. (2012). *Access to and Usage of Information among Rural Communities: a Case Study of Kilosa District Morogoro Region in Tanzania*: Canadian Journal of Library and Information Practice and Research, vol. 7, no. 1. Available online at Retrieved on 30/2/2014 from: http://journal.lib.uoguelph.ca/index.php/perj/article/viewFile/1646/2461

Mtega, W. and Benard, R. (2013). The state of rural information and communication services in Tanzania: a meta-analysis. International Journal of Information and Communication Technology Research, 3(2), 64 - 73

Mtega, W. P. and Malekani, A. W. (2009). *Analyzing the usage patterns and challenges of telecentres among rural communities: experience from four selected telecentres in Tanzania*: International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2009, Vol. 5, Issue 2. Retrieved on 30/2/2014 from: http://ijedict.dec.uwi.edu/include/getdoc.php?id=4376&article=625&mode=pdf

Mugenda, O.M. and Mugenda, A.G. (2003). Research Methods: Quantitative and Qualitative Approaches. ACT, Nairobi.

Mukerji, M. (2008). Telecentres in Rural India: Emergence and a Typology. Electronic Journal on Information Systems in Developing Countries. Available online at: www.ifip.dsg.ae/Docs/dc06_Maitrayee_Finalv3.pdf

Mulozi, D. (2008). Telecentres: knowledge sharing in rural Africa. Retrieved on 21/6/2014 from: http://www.share4dev.info/kb/documents/4344.pdf

Noble, H. and Smith, J. (2012). Issues of validity and reliability in qualitative research: Queens's University Belfast, Belfast, UK. Retrieved 5/8/2014 from: http://ebn.bmj.com/content/18/2/34.full

OECD, (2011). *The Relationship between Local Content, Internet Development and Access Prices*. Retrieved on 28/6/2012 from: http://www.oecd.org/dataoecd/51/8/1913021.pdf

Oestmann, S. and Dymond, A.C. (2001) *Telecentres - Experiences, Lessons and Trend*s. In C. Latchem & D. Walker (Eds.) *Telecentres: Case Studies and key issues* (1-16). Vancouver: The Commonwealth of Learning. Retrieved on 10/9/2013 from: http://www.col.org/colweb/site/pid/3337

Owen J.M. (2007). The scientific article in the age of digitization: Springer Science & Business Media. Available at: https://dspace.library.uu.nl/bitstream/handle/1874/.../DISS-JMO-final-DARE.pdf*?*

Panos, (1998). The Internet and Poverty; real help or real hype? Panos media briefing No. 28 April 1998 available at http:// www.panos.org.uk/global.report/details.asp

Patton, M. (2002). Qualitative research and evaluation methods, thousands Oaks California: sage publications

Polgar, S., & Thomas, S. A. (2000). *Introduction to research in the health sciences*. Edinburgh: Churchill Livingstone.

Reitz, J. (2010). *"Online Dictionary for Library and Information Science." ODLIS.* Retrieved on 28/6/2012 from: www.abc-clio.com/ODLIS/odlis_A.aspx

Rice B. & Ezzy T. (1999). Qualitative Research Methods. Oxford University Press, Oxford. Robson, C. (2002) Real World Research. 2nd edn. Oxford

Ritchie, J.,Lewis, J. & Elam, G. (2003). Designing and selecting samples. In Jane Ritchie & Jane Lewis (Eds.), Qualitative research practice. A guide for social science students and researchers (pp.77-108) Thousand Oaks, CA: Sage.

Roman, R. & Colle, R. D. (2002). *Themes and Issues in Telecentre Sustainability*: The Development Informatics working paper series, Paper No. 10. Available at: http://unpan1.un.org/intradoc/groups/public/documents/NISPAcee/UNPAN015544.pdf

Rose, J.B. (1999). Multipurpose Community Telecentres in support of People-Centred Development, Information and Informatics Division, United Nations Educational, Scientific and Cultural Organization (UNESCO). Available at: http://portal.unesco.org/ci/en/file_download.php/88a98c93cb19403fc8cc165dc790079bmultipurpose+community+telecenter.pdf

Saunders M., Lewis P. and Thornhill A. (2003). *Research Methods for business student*s: prentice hall, Harlow.

Shenton A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. Education for Information 22 (2004) 63–75. Retrieved on 3/2/2015 from http://www.crec.co.uk/docs/Trustworthypaper.pdf

Sirimane, S. (1996). *The information technology revolution: what about the developing countries?* CIDA International Development Centre: Development Express, No. 04. 26 August, 2008. Retrieved on 23/11/2014 from: http://www.acdi_cida.gc.ca/xpress/dex/dex9401.htm

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications, Inc

Subramanian, S., Nair, S. B. and Sharma, S. (2010). Local Content Creation and ICT for Development: Some Experiences. Retrieved on 20/2/2015 from: http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan035930.pdf

Tangco, D.C., Ma. (2007). Purposive Sampling as a tool for informant selection: Ethnobotany Research and Applications. Available at: http://journals.sfu.ca/era/index.php/era/article/viewFile/126/111

UNDP (1998). Information and Communication Technologies for Development. UNDP, New York. Available at: http://www.undp.org/info2

Waema, T.M., and Mitullah, W. (2011). E-governance and governance. Nairobi: East African Educational Publishers.

Weber, S. (2004). Pragmatism vs Interpretivism in Qualitative Information Research Systems. Retrieved from: http://liu.diva-portal.org/smash/get/diva2:515141/FULLTEXT01.pdf.

White M.J. (2005). Sociological Methods & Research. Retrieved on 3/2/2015 from http://smr.sagepub.com

Whyte, A. (2000). *Assessing Community Telecentres: Guidelines for Researchers*. International Development Research Centre (IDRC); Ottawa. Retrieved on 23/6/2013 from: http://web.idrc.ca/openebooks/263-5/

Wilson, T. D. (1999). *Models in information behaviour research:* Journal of Documentation, 55, 3: 249-270

World Summit on the Information Society (WSIS 2003) report: Retrieved on 28/6/2012 from: http://www.itu.int/wsis/geneva/index.html

Yin, R. K. (2003*). Case Study Research: Design and Methods*, (3rd ed.). Thousand Oaks, CA: Sage Publications.

Zaid, Y.A. (2011). Information Accessibility, Utilization and Socio-Economic Variables as Predictors of Quality of Life of Rural Women in Ekiti State, Nigeria: A PhD Post- Field Seminar. Academic Publications in Library Archival and Information Studies. Available at http://ir.library.ui.edu.ng:8080/jspui/handle/123456789/1146

APPENDIX I

LETTER OF INTRODUCTION TO THE RESPONDENTS

Dear Respondent,

I am a postgraduate student at Moi University taking a course in Masters of Philosophy in Information Science. As part of my studies, I am conducting a research on *'access to and use of information in the Kangundo and Mukuru digital villages'.* My research aims at improving access to and use of information in the digital villages.

For the success of the study, you have been identified as one of the respondents in the study. By answering the questionnaire, you will be contributing to the generation of knowledge about digital villages in Kenya. Your opinions in this questionnaire are valuable and I will highly appreciate them. I am also grateful for your time, co-operation and openness in answering the questions.

You do not have to provide your name and telephone number at the end of the questionnaire, but if you do provide your name, all responses will be kept confidential and will only be used for the purpose of completing this study.

Thank you in advance for taking your time to assist me in this research.

Baron Silas

APPENDIX II

INTERVIEW SCHEDULE FOR DIGITAL VILLAGE USERS

Section I: Respondents Background Information

1. Name……..(optional)

2. Age: Below 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ Over 50 ☐

3. Gender: Male ☐ Female ☐

4. Education Level: Primary ☐ Secondary ☐ Tertiary/College ☐ University ☐

5. Occupation …….(Optional)

Section II:

6. What kind of information do you need in you day to day life?

   ……

   ……

   ……

   ……

7. What are some of the sources that you use to access this information?

   ……

   ……

   ……

8. To what extent are your information needs met by the digital villages?

……

……

……

……

9. What are some of the services offered by the digital villages that you have used?

……

……

……

……

10. How to you rate this services offered in terms of quality?

……

……

……

……

11. What do you use internet services for in the digital village?

……

……

……

……

12. a) Are you aware of the existence of a pasha portal in this digital village?

- ☐ Yes
- ☐ No

b) If yes, have you used the pasha portal to access information?

☐ Yes

☐ No

c) What Kind of information have you accessed?

……

……

……

……

d) How often do you access this information?

……

……

……

……

e) Was the information relevant to you needs?

☐ Yes

☐ No

Explain

……

……

……

……

13. a) What are some of the factors that prevent you from accessing information from the digital villages?

    ……

    ……

    ……

    b) How can these challenges be addressed?

    ……

    ……

    ……

    c) In your own opinion, how important are digital villages in the dissemination of information?

    ……

    ……

    ……

14. What are some of the reasons why most people living around don't use digital villages to access information?

    ……

    ……

    ……

15. In your opinion, how can these challenges addressed?

    ……

    ……

    ……

APPENDIX III

INTERVIEW SCHEDULE FOR THE MANAGERS/OWNERS OF DIGITAL VILLAGES

1. When was this digital village started and what was the reason for starting it?
2. Who owns this digital village and who runs it on a daily basis?
3. What are the main services offered at this digital village and what do they cost the user to use them?
4. What other services have people here have requested that you don't offer at present?
5. What were the initial aims of this digital village and have these changed now? If so, how and what new uses are there for this digital village in the community?
6. What do people here generally say about this digital village to you in terms of information access and how it has helped their lives or improved their knowledge?
7. How do you market this digital village around this area or how do people in this area get to know about the digital village and what it can offer them?
8. What category of people uses this digital village? Is it used by old or young people most of the time?
9. What do these digital village users use the Internet for, because I can see them using Internet and browsing through the Web?
10. What are the major constraints of this digital village? In other words what major problems cause the operations of this digital village not to run smoothly and how do you overcome such problems?

APPENDIX IV

INTERVIEW SCHEDULE TO THE SECRETARY - DIRECTORATE OF ICT BOARD

1. Name..... (Optional)
2. Title .....
3. Specific activities performed by the Directorate

   ……

   ……

   ……
4. What achievements has the directorate made in line with the above activities?

   ……

   ……

   ……
5. What specific roles does the directorate have in digital villages?

   ……

   ……

   ……
6. To what extent has the directorate excelled in the above roles?

   ……

   ……

   ……

7. What are the general challenges affecting digital villages implementation?

……

……

……

8. How should the above challenges be addressed?

……

……

……

APPENDIX IV

OBSERVATION CHECKLIST

i. Observe the category of users visiting the digital village (Young or old, men or women)

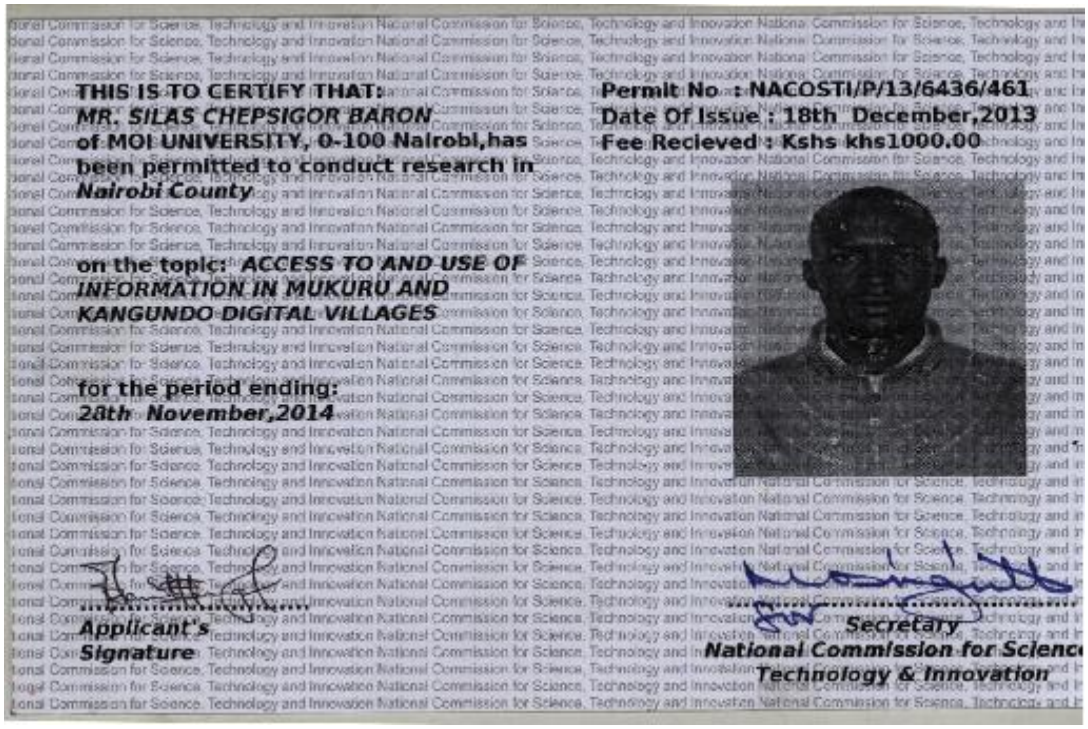
ii. Observe the equipment and services offered at the digital villages

iii. Observe the ease of use of computers and internet by users

iv. Observe the environment in which the digital village is set e.g. size of the room

APPENDIX V

RESEARCH PERMIT



THIS IS TO CERTIFY THAT:
MR. SILAS CHEPSIGOR BARON
of MOI UNIVERSITY, 0-100 Nairobi,has
been permitted to conduct research in
Nairobi County
on the topic: ACCESS TO AND USE OF INFORMATION IN MUKURU AND KANGUNDO DIGITAL VILLAGES
for the period ending:
20th November,2014

Permit No : NACOSTI/P/13/6436/461
Date Of Issue : 18th December,2013
Fee Recieved : Kshs khs1000.00

Applicant's Signature

Secretary
National Commission for Science
Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 7778

CONDITIONS: see back page

Designed & Printed by:
Jay Enterprises