UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

E-READINESS ASSESSMENT IN MICROFINANCE

INSTITUTIONS IN KENYA

BY

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Declaration

This research project is my original work and has not been submitted to a degree course in any other university.

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This research project has been submitted for examination with my approval as the university supervisor.

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Dedication

To my

Husband,

Raphael Mwanza.

And

Mum

Agnes Mumbua Kalui.

Acknowledgements

TABLE OF CONTENTS

List of Abbreviations

AFC	Agricultural Finance Corporation
ASCA	Accumulating Savings and Credit Association
AMFI	Association of Microfinance Institutions
APEC	Asian Pacific Economic Cooperation
CBO	Community Based Organization
CEO	Chief Executive Officer
CGAP	The Consultative Group To Assist The Poor
CISL	Composite Information Systems Laboratory
CID	Centre for International Development
CSPP	Computer System Policy Project
DFI	Development Finance Institutions
DP	Data Processing
EFT	Electronic Funds Transfer
EIU	Economic Intelligence Unit
EUC	End-User Computing
GDI	Global Diffusion of The Internet
ICT	Information and Communication Technology
IFA	Integrated Framework of Assessment
KAM	Knowledge Assessment Technology
KPOSB	Kenya Post Office Savings Bank
MFI	Microfinance Institution

MI	McConnell International
MSE	Micro- and Small- Scale Enterprise
NRI	Network Readiness Index
NGO	Non-Governmental Organization
POS	Point of Sale
ROSCA	Rotating and Accumulating Savings and Credit Associations
SACCO	Savings and Credit Co-operative Society
TAI	Technological Achievement Index
UNCTAD	United Nations Conference on Trade and Development

List of Tables and Figures

FIGURES

Abstract

The growing importance of the Internet world and technological innovations has become a major catalyst for change in many business operations and processes including the financial sector players. In fact, Internet-based concepts and technologies like e-commerce and e-business are increasingly being used and adopted to enhance productivity and efficiency. The financial sector has embraced the use and adoption of modern and innovative Information and Communication Technologies such as e-banking and m-banking thus enhancing the importance of technology in businesses. The financial sector players are varied, ranging from commercial banks, MFI and Saccos, among many others, with varied magnitudes and capacity to adopt and use modern and innovative technologies. Kenya's MFIs need to adopt and use modern and innovative technology in order to survive and compete in the domestic and global financial markets. However, to implement and utilize modern and innovative technology requires that the MFIs are e-ready, hence the need to evaluate their e-readiness levels.

This research investigated the level of e-readiness in MFIs in Kenya and developed an appropriate framework for assessing the e-readiness levels of the MFIs in order to productively utilize modern and innovative technologies to achieve foreseen benefits and opportunities. The framework was tested and validated with the data collected from MFIs and their clients. The results indicated a clear and in-depth picture on the e-readiness level of MFIs in Kenya and highlighted intervention areas. Most MFIs were found to be not e-ready.

The study challenges included difficulty of finding necessary and appropriate data and limited resources in terms of time and funds, which was complicated by the fact that data in financial institutions is generally confidential. There is need for further research in this area in order to generalize the findings.

CHAPTER ONE

INTRODUCTION

1.1   Background

The financial system in Kenya comprises of both formal, quasi-formal and informal financial service providers including commercial banks, mortgage finance companies, microfinance institutions (MFIs), savings and credit cooperatives societies (SACCOs), Development Finance Institutions (DFIs) such as the Kenya Post Office Savings Bank (KPOSB) and Agricultural Finance Corporation (AFC), foreign exchange bureaus, capital markets industry players, retirement benefits industry players, insurance industry and several informal financial service providers such as Rotating and Accumulating Savings and Credit Associations (ROSCAs and ASCAS), shopkeepers and money lenders.

Microfinance involves the provision of a variety of financial services and products ranging from savings/ deposit mobilization, lending facilities, money transfer and micro-insurance, among others, using innovative delivery channels and methodologies to the economically active poor, low-income households and micro and small scale enterprises (MSEs) in both rural and urban areas. The microfinance industry in Kenya consists of hundreds of microfinance institutions operating under different institutional forms arising from different legislations they operate in, including the Companies Act, Societies Act, Banking Act, Hire Purchase Act, Co-operative Societies Act, Trust and Trustees Act, Non-Government Organizations Co-ordination Act, Building Societies Act, State Corporations Act, and Kenya Post Office Savings Bank Act as well as various Community Based Organizations (CBOs) registered by the Ministry of Culture and Social Services. The exact number of microfinance institutions in Kenya is largely unknown.

As at December 2007, the banking industry consists of 43 commercial banks, 2 mortgage finance companies and 1 financial institution. Of these, four banks, namely, the Co-operative Bank, K-REP Bank, MFI 2 and Family Bank offer microfinance products and services. Several MFIs under the Umbrella Body known as the Association of Microfinance Institutions (AMFI), which

currently has 34 members (30 retail MFIs, 2 wholesaler and 2 insurance companies) serving more than one million clients spread throughout the country. These institutions are operating as non-deposit taking MFIs providing lending facilities as well as non-financial services to a clientele that is poorer and more vulnerable than traditional banking institutions clients. The banking industry and KPOSB as at 31st December 2007 had about 4.7 and 1.3 million savings accounts, while AMFI member MFIs and SACCOs had about 1.1 and 3.3 million savers and members, respectively. This brings to about 10.4 million savings clients served by the formal and quasi-formal financial service providers out of a total population of about 37.2 million Kenyans, which translates to about 28% of the total population. This excludes the provision of financial services and products by informal institutions.

According to the Central Bank report (2007), only 19% of Kenyans have access to formal financial services through commercial banks and KPOSB. An additional 8% of Kenyans were served by Savings and Credit Co-operative societies (SACCOs) and MFIs, while 35% of Kenyans depended primarily on informal financial service providers such as Rotating and Accumulating Savings and Credit Associations (ROSCAs and ASCAS), shopkeepers, and money lenders. These findings indicate that about 62% of the total population access financial services and products using formal, quasi-formal and informal providers, leaving about 38% of Kenyans with no access to any form of financial services and products, classified as "financially excluded".

The Government financial sector development as outline in Kenya Vision 2030 is based on three pillars, namely: Access, Stability and Efficiency aimed at making Kenya a regional hub. The Vision also envisages that Kenya should become a knowledge-led economy wherein, the creation, adaptation and use of knowledge and ICT (e-economy and e-society) will be among the most critical factors for rapid economic growth. Kenya Vision 2030, therefore, envisages that financial service providers have to enhance access (effectiveness) and efficiency in their operations, while ICT will play a key role in achieving this target and socio-economic development objectives of our economy. In order to achieve high levels of efficiency and effectiveness, financial service providers have and should continue to embrace the use of modern and innovative technology in their business operations. According to the Central Bank, Bank

Supervision Annual report (2007), banking institutions have continued to invest in ICT in order to improve their effectiveness, efficiency and competitive edge as well as enhancing their product range to suit their clients needs. The demand for a wide variety of accessible and affordable financial services and products by clients is high, which calls for innovative delivery channels and methodologies. In order for financial service providers to respond, they need to continue to leverage on ICT and ICT enabled services such as electronic processes in a move to paperless operations, internet banking, ATMs, Point-Of-Sale (POS) devices and mobile telephony as an additional service delivery channels. This has seen a rapid increasing role and use of ICT in the financial sector. Furthermore, Kenya's two mobile telephone providers have introduced money transfer services using mobile phones, namely: M-PESA by Safaricom and Zap by Zain, thus reaching out to hitherto un-banked and underserved segments of the Kenyan population and providing increased competition and efficiencies.

Evidence from several studies and observations have shown that financial service providers, globally and locally, have rapidly increased the use and adoption of modern and innovative ICT and ICT enabled services such as electronic banking including internet banking, ATMs, Point-Of-Sale (POS) devices, electronic funds transfer and e-money, whilst moving from paper based processes to paperless processes with the aim of improving their efficacy, profitability and sustainability. This indicates that ICT has continued to play an increasingly central role in the financial system businesses and processes the world over. Various findings indicates that the usage and capability to adopt and use modern and innovative ICT and ICT enabled services is not uniform across the various financial service providers within a country and across countries due to difference in e-readiness in ICT adoption, resource availability and technological skills. For example, the Kenyan banking industry usage of ICT is different based on size of the bank, ownership (whether local or foreign or multinational), resource base and access to technology. These differences have given rise to the digital divide within and across various financial sector players as well as within and across countries financial systems. Furthermore, different financial service providers ranging from commercial banks, SACCOs and MFIs have different levels of ICT usage and capabilities of using and adapting ICT and ICT enabled services. The use and adoption of modern ICT and ICT enabled services are spreading across the financial system from banks to MFIs and SACCOs, among others and are driving the rapid growth of innovative

delivery channels and methodologies including the emerging "Branchless Banking". Branchless Banking[1] as become a permanent feature in many countries financial systems with modern national payment systems and e-banking that have boosted access to finance in countries such as Philippines, Indonesia, Pakistan, Peru, India and Brazil. The emerging financial landscape worldwide is driven by ICT, market dynamics and competitive edge confers a number of benefits in terms of access, efficiency and stability but it also entails more risks factors and increased costs mainly investment of infrastructural facilities, ICT and risk management systems as well as human resource development. Usage of ICT and ICT enabled services by MFIs enhances their effectiveness and efficiency in providing microfinance services to their clients, hence improve welfare and risk management.

The emerging conclusion here is that the role of ICT in the microfinance industry will continue to expand and play a central role in expanding access and improving efficacy in service delivery. Several MFIs have embraced the use of modern and innovative ICT with varying levels and intensity, while others have not. The use of modern and innovative ICT has yielded benefits in several areas, including -

a) Improving operational efficiency and risk management, thus lowering transactional and overhead costs;

b) Enhancing access to finance by clients at their convenience through ATMs, POS devices, agency arrangements, among others as well as competitive edge;

c) Establishing secure identities for customers and database management for efficient decision making and security such as the use of biometrics;

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[1] **"Branchless banking"** – means the act of providing financial services and products including deposit mobilization, lending and money transfer, among others by institutions (commercial banks, MFIMFIs, SACCOs etc.) to its customers without putting up physical ''brick and mortar'' structures through strategic alliances between financial institutions and non-financial institutions such as telecommunication companies or agents (supermarkets chains, shopkeepers, petrol stations, etc.) using innovative delivery channels and methodologies like mobile phone, internet and POS devices, among others. In such arrangements, financial institutions will be enabled to partner with telecommunication companies or agents in the provision of financial services and products that leverage on IT.

d) Improve the quality of financial information and decision making; and

e) Expanding their customer base and reach into underserved and un-banked segments of the population.

Thus, the role of ICT in MFIs has taken a central place and its use and adoption is rapidly increasing. Further, the enactment of the Microfinance Act, 2006 that came into effect from May 2008 set a new dawn to the legal, regulatory and supervisory framework for the microfinance industry. The Central Bank has already licensed one deposit-taking MFI. The full implementation of the Act will act as catalysts for MFIs to use and adopt modern and innovative ICT, hence the need to research and document evidence to guide policy solutions and future developments. MFIs also need to adopt ICT in order to compete adequately with banks and SACCOs, among others as well as deepening the financial markets.

1.2   Problem Statement

ICT has become the backbone of most financial institutions including MFIs the world over in their operations and service delivery channels and methodologies, which have shifted from paper base to digital mode (e-system). Kenya has not been left behind and has seen rapid increase in the adoption and use of modern and innovative ICT and ICT enabled services. However, digital financial service delivery channels and methodologies confront a number of challenges mainly the e-readiness of MFIs and clients to use and adopt modern and innovative ICT and ICT enabled services and reduce or eliminate the digital divide.

Various studies have been carried out to provide insight into the overall e-readiness of countries at the macro level but few studies have attempted to evaluate e-readiness from a micro perspective with specific focus on sectoral analysis. Findings from various studies indicate increased use and adoption of ICT by financial institutions including MFIs, aimed at improving their efficacy, competitive edge and performance (effectiveness, profitability and sustainability). The adoption and use of ICT is not uniform across the various financial service providers such as

5

commercial banks, MFIs, SACCOs and insurance companies, among others due to a combination of several factors like difference in e-readiness in ICT adoption and usage, resource availability and technological access and skills. The other critical driver of adoption and usage of ICT by MFIs and other financial service providers depend on the usage and e-readiness of society. However, MFIs face the threat of being left behind if they do not address the growing digital divides between MFIs and other financial service providers that may put them in a disadvantaged position.

The infusion of ICT in microfinance industry is not uniform across the various players and may reward those who have the ability to adopt and use ICT with increased benefits and advantages. In fact, various reports indicate that MFIs have different levels of ICT adoption and usage from Brazil to India, and the world over. There is no study on the e-readiness of MFIs in Kenya with respect to ICT access, adoption and usage. In particular, there is little known about e-Readiness for e-banking, which is the focus of this research (Maugis.V.et al 2004,). Consequently, this research seeks to investigate the status of e-readiness of MFIs with respect to their ability to apply ICT and ICT enabled services to enhance efficacy, effectiveness and competitive advantage in service delivery to their customers.

1.3 Objectives of the Study

The main objective of the research study is based on existing e-readiness tools/ frameworks, develop a framework for assessing e-readiness in MFIs in Kenya. The specific objectives of the research study are to –

a) Identify key indicators that can be used to measure e-readiness of MFIs in Kenya to embrace electronic business (e-banking); and

b) To evaluate the developed framework in the Kenyan MFI context.

c) Develop an Information System for carrying out E-Readiness assessment for Kenyan MFIs.

d) Assess the e-needs of MFIs clients using a sample of the clients.

6

1.4 Research Questions

Findings from various studies, reports and observations indicate that financial service providers are using Information and Communication Technology (ICT) and its adoption and usage is rapidly increasing, thus, improving their efficacy and outreach. MFIs have not been left behind in adopting and using modern and innovative ICT and ICT enabled services in their operations and provisions of microfinance services. Thus, a better understanding of the factors determining the use of ICT by MFIs and their e-readiness to adopt and use modern and innovative ICT play a critical role in designing and implementing ICT strategies and models for the microfinance industry. Most MFIs, as is the case for all other financial service providers, have scarce resources that need to be optimally allocated to enhance the efficiency and effectiveness of operations and service delivery at the least cost, thus improving their effectiveness (access), efficiency, competitive edge, customer satisfaction, performance and profitability, hence sustainability.

It is important to note that ICT alone is not enough to solve all the problems and challenges facing microfinance institutions and their clients. The level of ICT usage and adoption in the microfinance industry is of varying degrees across MFIs and in some cases unknown. Some MFIs have a high degree of usage, while others have very low levels or none, due to their difference in e-readiness and resource availability. This study attempts to answer several fundamental questions such as-

a) What is electronic readiness in MFIs?

b) What key factors determine the e-readiness of MFIs to use ICT in their operations and activities and in serving their customers based on existing literature and findings?

c) What is the appropriate framework for assessing e-readiness in MFIs based on existing frameworks?

d) How the e-readiness level in Kenyan MFIs can be assessed through the developed framework?.

1.5 Importance and Justifications of the Study

For most financial institutions the world over, ICT have become the backbone of their operations and financial service delivery channels and methodologies. The financial systems, globally, have shifted from paper-based to the digital mode (e-system). The integration of ICT and ICT enabled services in the delivery of financial services globally and in Kenya has gain momentum. Kenya has seen a rapid increase in the use of modern and innovative ICT and ICT enabled services such as ATMs, mobile phones example the M-PESA and Zap by Safaricom and Zain, respectively, and POS devices, among others. The rapid growth of ICT development and use in the provision of financial services in Kenya has brought a major focus on technology driven services to enhance effectiveness, efficiency and access. However, digital financial service delivery channels and methodologies confront a number of challenges mainly e-readiness of institutions, clients to use and adopt modern and innovative ICT and ICT enabled services and the digital divide.

An assessment of the existing status of the usage of ICT and ICT enabled services will help in determining the current situation in order to plan for the future and advocate specific changes. Secondly, an e-readiness, when properly applied in a larger process of evaluation, is a first step towards converting good intentions into planned actions that will bring real changes to the conduct of businesses and people's lives and enhance access to finance. Thirdly, an effective e-readiness assessment will guide MFIs computerization and ICT efforts by providing benchmarks for comparison and gauging progress. Lastly, an e-readiness assessment will be a vital tool for judging the impact of ICT and replace vague assumptions and evidence about the role of ICT in microfinance with concrete data for comparison as a basis for determining the current scenario in order to plan for the future and advocate for changes to create an enabling ICT environment in Kenya.

This research study will highlight the current development and the future outlook in the use of ICT and ICT enabled services in the provision of financial service to the poor and MSEs. But the extent to which the digital financial services will afford increased access to financial services to these segments of the population remains unclear. The study will also explore key ICT developments in the financial sector in Kenya and the e-readiness by a cross-section of MFIs and

their clients. This research study argues that pro-poor digital financial services will go a long way in eliminating socio-economic exclusion, enhance accessibility and uplift living standards of the majority of Kenyans, especially the poor and low-income households. The direct and indirect benefits of ICT innovations and enabled financial services to the poor, low-income households and MSEs require an assessment to establish how ICT can enhance access (usage and penetration) to financial service and penetrate untapped potential markets; and e-readiness of financial institutions to adapt and use ICT and ICT enabled services.

1.6 Scope of Study

Why the Microfinance industry in Kenya's financial sector?

We selected the microfinance industry for three reasons. Firstly, the Kenyan financial sector has become very competitive among the various players with increasing levels of ICT usage and adoption. Secondly, the microfinance industry has occupied a central place in policy and as one of the key tools in the fight against poverty and expansion of access to finance. Lastly, microfinance has emerged a key player over the last few decades that have an established history of comparative advantage in enhancing access to the un-banked and underserved segments of the population, globally and in Kenya.

To begin with, ICT offer many potential benefits and opportunities for MFIs including reduction in transaction costs, enhances effectiveness and efficiency thus promote competition and introduction of innovative delivery channels and methodologies. By allowing effective and increased adoption and use of ICT by MFIs will offer them an opportunity to overcome the competitive advantage to their competitors like banks. As such, the study will undertake an assessment of e-readiness of MFIs using an appropriate framework. The framework will develop common parameters based on existing models including measures of policy, physical infrastructure/ usage (e-infrastructure), people (education, skills and knowledge of ICT), process (e-commerce) and environment, etc.

We chose e-readiness assessment of MFIs as our area of investigation because both issues, e-readiness and e-banking, have gained a lot of attention globally in recent years. Microfinance has occupied a central role as a key tool in the fight against poverty and vital vehicle in expanding access to financial services and products, and the same is the case for Kenya. Moreover, we have limited the subject to e-readiness assessment to selected microfinance institutions due to time and resource constraints. Therefore, my area of thesis research is limited to assessment of e-readiness in selected microfinance institutions and the e-needs of MFIs clients taking into consideration the rapid development and use of ICT in the microfinance industry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Digital integration, with its ICT infrastructure, and its applications of e-government, e-commerce, e-learning, e-banking and other e-applications, is becoming increasingly important as a vital tool for development and change. During the last decade or so, many governments, business, and social organizations around the world have considered their e-readiness and how best to harness the power and benefits of ICT and ICT enabled services for development and enhance effectiveness and efficiency. The ICT knowledge and applications is emerging from different fronts, namely: ICT infrastructure, the rise in ICT knowledge intensity and the increasing globalization of socio-economic affairs. However, several countries and economic units face the threat of being left behind if they do not address the growing digital divides both between and within countries and economic units and its citizens.

The extent of use of ICT is related to the e-readiness of the economy (e-government, e-commerce, and e-society) and the computing environment. An e-ready society is better place to use and benefit from ICT and ICT enabled services in a globally competitive world. The computing environment is normally classified into two broad categories, namely: The Traditional Data Processing (DP) and End-User Computing (EUC). In the DP environment, the user interacts indirectly with the computer through professionally trained staff. On the other hand, in the EUC, the user is supported by professional consultants, vendor support program or through education/ training firms who act as intermediaries between the computer and the user. Hence the emergence of the key role ICT plays in development and the rapid interest in assessing the usage and e-readiness to adapt and use ICT and ICT enabled services.

This section will review the concept of e-readiness; selected e-readiness assessment models, e-banking practices by financial institutions and develop a methodology to be used in this study.

Then according to the aim of the research, the best framework and definition will be chosen to fulfill the requirements of research questions

2.2 RQA: What is E-Readiness?

2.2.1. The Concept of E-Readiness

There is no standard definition for e-readiness that is perfect because e-readiness is a relatively new concept to provide a unified framework to evaluate the breadth and depth of the digital divide between and within countries, enterprises and societies. An e-readiness assessment gauges how ready a society or economy is to benefit from ICT and e-commerce. "The first efforts in defining e-readiness were undertaken in 1998 by the Computer Systems Policy Project (CSPP) when it developed the first e-readiness assessment tool known as Readiness Guide for Living in the Networked World. It defined e-readiness with respect to a community that had high-speed access in a competitive market; with constant access and application of it in schools, government offices, businesses, healthcare facilities and homes; user privacy and online security; and government policies which are favorable to promote connectedness and use of the network (Beig et al 2007)."

However, there are various several assessment guides that have been developed including The Asian Pacific Economic Co-operation (APEC), The Centre for International Development at Harvard University, The Network World, McConnell International and World Economic Forum Consultation Report. Formally, e-readiness can, therefore, be defined as: *"The degree in which a country, business enterprises, community is prepared and qualified to participate in the networked world in their degree of relative knowledge and preparedness in most of the important areas for the adoption and use of ICTs and ICT applications".*

2.2.2. The Digital Divide

"The emergence of electronic commerce over the past decade has radically transformed the economic landscape. For developing countries, the digital revolution offers unprecedented

opportunities for economic growth and development, as entrepreneurs from Bangalore to Guadalajara to Dakar can testify" Kofi A. Annan (2001).

There is a general consensus that governments, businesses and all individuals need to harness the power of ICT and ICT enabled services for wider access and improved welfare standards. However, the emergence of the "Digital Divide" looming ever larger as a result of different levels and degree of the breadth and depth of ICT in government, business and society calls for concerted efforts by leaders and decision makers to narrow this gap by determining the factors that determine whether people and businesses can truly access and use ICT in their daily lives and operations, respectively. The digital divide is centered on two concerns that global networks can potentially transform substantially the economic, political and social relationships; and without the participation of a growing number of individuals and businesses, the growth potential and the creation of new value propositions associated with the digital society will not materialize. Countries, especially developing countries are encouraged to increase their e-readiness and usage of ICT and ICT enabled services in order to enhance and accelerate their growth and development progress. However, the widening digital divide, both within and among countries, businesses and communities, can impede the attainment of this goal and full potential of ICT. Each country needs to tailor its ICT strategies, while remaining focus on the goal of e-readiness and society's overall development.

2.2.3. Why E-Readiness

Many factors promote the need to be e-ready, including:-

a) The enormous advantages that ICT will bring along by including both political, social and economical benefits and opportunities;

13

b) With globalization and competition, countries and enterprises are facing a threat of being left behind or losing market share or not exploiting market potential, thus becoming less competitive;

c) Global leaders, Governments, development partners and various social and economic units are integrating ICT and ICT enabled services into their development, aid programs, business operations and daily life; and

d) Again, ICT is a key weapon/ tool in the war against poverty and general economic development impediments.

2.3   Reviewing and Evaluation of Available Framework

There are various reasons why there is increased impetus among countries and societies in assessing their usage of ICT and e-readiness status and strive to become inclusive global knowledge societies, where all persons without distinction are empowered to create, receive, share and utilize ICTs for their economic, social, cultural and political development. E-readiness assessments are also useful in understanding and identifying the most key and relevant ICT based development opportunities and have a competitive edge. E-readiness act as catalyze in the use and adoption of ICT and ICT enabled services. In order to put ICT to effective and practical use, a society must be 'e-ready' in terms of infrastructure, e-commerce, e-governance, accessibility of ICT to the population at large and the effects of the legal and regulatory framework on ICT usage and adoption, collaborations and determining vision, strategy and priorities. The e-readiness of MFIs in Kenya to adopt and use ICT is at different levels with varying abilities and capabilities to adopt and use ICT that need to be assessed. The usage and adoption of modern and innovative ICT by MFIs largely depend on their e-readiness.

There exist various methodologies and tools for determining e-readiness of business enterprises and society (clients) with different measurable indicators. However, there are some common underlying indicators like internet, telecommunication infrastructure, environment and availability of computers. It is the expectation of the researcher that the identified framework

will be a useful tool in determining the e-readiness of MFIs to use and adopt ICT. The researcher will also collect data information on the indicators of the proposed framework to assess the e-readiness of MFIs.

As a systematic approach first the researcher started with methods which formally presented as assessment tools, and we looked for assessment methods which can be gathered from other sources, including position papers and surveys results to compare them and give a conclusion about how in research one tool or combination of some should be used to meet the specific assessment needs and how a more comprehensive e-readiness assessment tool could be developed.

Numerous e-readiness assessment tools have been created and used by different groups and individuals, each looking at various aspects of ICT, society, businesses and the economy, including the McConnell International (MI), the Economist Intelligence Unit (EIU), the United Nations Conference on Trade and Development (UNCTAD), the Technological Achievement Index (TAI), the Global Diffusion of the Internet (GDI), the Network Readiness Index (NRI) and the World Bank's Knowledge Assessment Methodology (KAM). These e-readiness models/ approaches have specific areas of concentration with specific indicators to assess e-readiness. We have selected few considered to be relevant to this particular study as elaborated below.

2.3.1 CSPP's E-Readiness Guide For Living in the Network World

The Computer System Policy Project (CSPP) developed an e-readiness tool published in 1998 designed to help individuals and communities determine how prepared they are to participate in the network world. The network measures the prevalence and integration of ICT in homes, schools, businesses, health care facilities and government offices with additional focus on competition among access providers, speed of access and government policy. Measurement is divided into five dimensions or categories, namely-

a) *The Network Infrastructure* – This focused on the backbone technologies and infrastructure that connect you to the network.

b) *The Network Places* – Infrastructure alone does not ensure connectedness but the network must extend to the places where people spend time and access networks through wired access or mobile technologies.

c) *Network Applications and Services* – This refers to how we use connectedness to make it meaningful and purposeful especially its ability to adopt and use ICT. The Network World is all about how we are able to adopt and use the Network to make our lives better, jobs more meaningful, time more well spent, people smarter and communications stronger, healthier and safer. In the case of MFIs, how they adopt and use ICT to improve their operations and ability to enhance effectiveness and efficiency in delivering services to their customers, hence increased profitability and sustainability.

d) *Network Economy* – The role of the Network in driving the economy and businesses. The internet has already revolutionized economies and the way of life.

e) *Network World Enablers* – This refers to the key factors or levers that expedite the Network World to enable users benefit more from the Network World.

The tool provides 23 structured questions for community to ask about itself with regard to the network world and for each question, the users choose from a set of answers, which represent four progressive stages of development. The questions are categorized into five categories or dimensions as listed above with several indicators. The assessment produces a rating that indicates the country or community's stage the country or community is at for each of the five categories. Furthermore, 'an overall score' for the country or community can be estimated by simply assigning weights and averaging the scores across the criteria.

2.3.2 The CID E-Readiness Tool

The Centre for International Development (CID) at Harvard University developed this guide in 2000 (http://www.readinessguide.org). According to Peters (2001), this guide draws from the support of IBM and draws from the CSPP guide described above. The guide or tool organizes the

assessment of numerous factors/ indicators that determine the Network readiness of a community. Readiness is the degree to which a community is prepared to participate in the network world. It is gauged by assessing a community's relative advancement in the areas that are most critical for ICT adoption and the most important applications of ICTs. E-readiness assessment tools required for assessment can be classified into two broad categories, namely –

a) E-economy readiness tools that focus on a nation's readiness to exploit ICT for economic development, that is, to take part in the digital economy.

b) E-society readiness tools that measure the ability of the overall society to benefit from ICT and exploit potential opportunities.

In general, the CID Tool defines 19 categories of indicators of the degree of e-readiness of a community or country split into five main groups as follows –

i). *Network Access* – This measures readiness of ICT infrastructure in terms of bandwidth, availability, reliability cost and quality, services and equipments, pricing, etc. The indicators here address the question - What are the availability, cost and quality of ICT networks and services? The indicators are information infrastructure, internet availability, network speed and quality, hardware and software, and services and support.

ii). *Networked Economy* – This group measures the use of ICT by businesses and the government in commerce and/ or delivery of services. The indicators here address the question: How are businesses and governments use ICT to interact with the public and with each other (B2C or B2B). The indicators include ICT employment opportunities, business-to-customer (B2C) e-commerce, business-to business (B2B) e-commerce and e-government

iii).*Networked Learning* – This group aims to measure the level of access to ICT by educational institutions, the ICT related programs and utilization of ICT in teaching and learning. The indicators address the questions: Does the educational system integrate ICT into its processes to improve learning? Are there technical training programmes in the community that can

train and prepare an ICT workforce? Are there significant opportunities available for those with ICT skills? The indicators include schools access to ICT, enhancing education with ICT and developing the ICT workforce.

iv). *Networked Society* – This group measures the degree to which people and organizations are using ICT. The indicators here address the questions: To what extent are individuals using ICT at work and in their personal lives? The indicators include people and organization online, locally relevant content, ICT in everyday life, and ICT in the workplace.

v). *Network Policy* – This group is used to assess the ICT policy strategy and/ or legislation and the success or failure of the policy or regulatory environment. The indicators here address the question: To what extent does the policy environment promote or hinder the growth of ICT adoption and use? Indicators are telecommunications regulations and ICT trade policy.

The CID Tool considers that the minimum necessary condition for e-readiness is access to adequate network infrastructure. Access is determined by a combination of the availability and affordability of use of the network itself as well as of the hardware and software needed for network interface. The quality and speed of the network are also important in determining how the network is used. The customer service orientation of access providers is a major factor in network application adoption and usability.

Besides, according to Peters (2001), the CID tool provides a grid with descriptions of the four stages of advancements in each of 19 indicators, which are placed into five groups. Communities estimate their current stage of development in each indicator. No prescription is given on how that estimate should be made. Also CID rates the stage a community is in for each of the 19 indicators and descriptions are given of what's required to be in a particular stage (CID, 2000).

The CID guide provides a firm base upon which to build a planning dialogue and is an important step in making sound policy and investment decisions. Communities may have difficulty placing themselves in a specific stage within a particular or some set of categories, as certain indicators within a stage may not be consistently linked. A community facing this situation should

realistically determine which indicator is most relevant to its own ICT goals and stage of development.

2.3.3 APEC's E-Commerce Readiness Assessment tool

The Asian Pacific Economic Co-operation (APEC) Electronic Commerce Steering Group developed this tool/ guide in 2000, to help governments develop their own focused policies, adapted to their specific environment for the healthy development of e-commerce (http://www.e-commerce.gov\apec\docs\readiness-background.html). According to Peters (2001), this tool measures six categories for readiness for e-commerce, namely –

i). Basic infrastructure and technology (speed, pricing, access, market competition, industry standards and foreign investment etc.).

ii). Access to network services (bandwidth, industry diversity, export controls, and credit card regulation, etc.).

iii). Use of the internet (use in business, government, homes, etc.).

iv). Promotion and facilitation of industry led standards.

v). Skills and human resources (ICT education, workforce and skills etc.).

vi). Positioning for the digital economy (taxes and tariffs, industry self-regulation, government regulations, consumer trust and protection, etc.).

The tool asked participants one hundred multiple-choice questions grouped into the six categories and the responses indicate progressive levels of e-readiness for a country or community. However, there was no overall scoring used. The product of assessment is based on the answers to the 100 questions and countries are supposed to work on areas with less than optimal answers to reduce or eliminate impediments to the deployment of e-commerce, e-government and e-society.

2.3.4 McConnell International's report

McConnel International prepared this assessment tool in collaboration with the World Information Technology and Services Alliance (WITSA) that measures five key areas, namely –

i). Connectivity (infrastructure and access);

ii). Government policies (government policies and regulations);

iii). Information security (intellectual property, privacy and electronic signatures);

iv). Human capacity (ICT education, available skilled workforce); and

v). E-business climate (competition, political and financial stability, foreign investment and financial infrastructure).

For each country and each category, the report performs a "dynamic evaluation of the relevance and accuracy of available quantitative data with an understanding of myriad cultural, institutional and historical factors". These ratings and their narratives can be used as a starting point for further planning and analysis. Countries are rated in the five categories listed above on a scale of one to three (Blue, Amber and Red) and extensive analysis and recommendations are given. The track record of studies addressing e-Readiness matters is as impressive as it is wanting. These studies are impressive because they reflect the views and interests (as well as the methods and approaches) of consulting firms, academic researchers, and government organizations, national as well as international. They are wanting because it is difficult to extract a coherent view of the realities at hand, or the methods upon which they are developed. As such, they provide little guidance for business and government, perhaps even obscuring the realities as well as the opportunities (Maugis et al, 2004).

2.3.5 E-economy versus E-society

According to bridges.org, e-readiness comparison and e-readiness assessment tools and models can be divided into two main categories: those that focus on basic infrastructure or a nation's readiness for business or economic growth, and those that focus on the ability of the overall society to benefit from ICTs. These two categories, which this literature describes as 'e-economy' assessment tools and 'e-society' assessment tools are not mutually exclusive. However, 'e-society' tools incorporate business growth and use of ICTs as part of their larger analysis, and consider business growth necessary for society's e-readiness (Ruikar, 2003). E-economy focused tools also include some factors of interest to the larger society, such as privacy and universal access. These rough categorizations for the above tools are as follows:

E-Economy

The APEC's E-commerce E-readiness report provides an assessment gauge of a country's readiness from e-commerce through a detailed questionnaire focusing especially on imports - exports and policy. On the other hand, the McConnell International's E-readiness report describes how countries are rated in five categories including infrastructure and access, government policies, human capacity, information security, and business climate, on a scale of one to three ('blue', 'amber', 'red').

E-Society

The CID's E-readiness Assessment Guide gives an assessment categorizing countries along four stages of development for each of 19 categories, focusing on technology infrastructure, the regulatory, the networked society and the networked economy. While the CSPP Readiness Guide Tool gives an assessments that rate communities along four progressive stages of development for each of the five categories, focusing on existing infrastructure and the pervasiveness of technology in the society.

2.4 Related Research on E-Readiness

2.4.1 Network Readiness Index (NRI) report

Several studies have used this NRI[2] framework to measure the development of internet interconnectivity and ICT across a wide spectrum including readiness, intensity and impacts in different countries and sectors. The framework focus cuts across E-readiness, effects of knowledge economy index, usage and impacts by concentrating on a range of predefined indicators which can be integrated into a wider framework of economic and social performance measures. The index is a composite of three components, namely: the *environment* for ICT offered by a given country or community (market environment, policy and regulatory environment and infrastructure environment); the *readiness* of the community's key stakeholders (e-readiness by individuals, businesses and government) to use ICT; and the usage and impacts of ICT amongst these stakeholders (individuals, businesses and government). These measures tend to capture the entity's (individual or business or government) competitiveness and development. This measure relies on the availability of credible hard facts data

2.4.2 Readiness for E-Banking

Our framework derives from, and is the basic definition of e-Readiness as a function of *the ability to pursue value creation opportunities.* Methodologically, the core elements of the definition can then be parsed to represent the e-Readiness for any community, investor, nation, business etc. Earlier studies provided the foundations for a rough rule of thumb, a set of criteria, to help to distinguish among (i) factors essential to *access* conditions (related to enabled physical connectivity), (ii) factors pertaining to *capacities* that are necessary but not Sufficient (pertaining to social, economic and related policy conditions) for e-Readiness, and (iii) variables that provide 'final proof' of e-Readiness mobilization – namely capturing the convergence of necessary and sufficient bases for realizing a particular *value-creation opportunity*. The Domains of e-Readiness include the following –

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[2] NRI is defined as the degree of preparation of a nation or enterprise or society/ community to participate in and benefit from ICT developments.
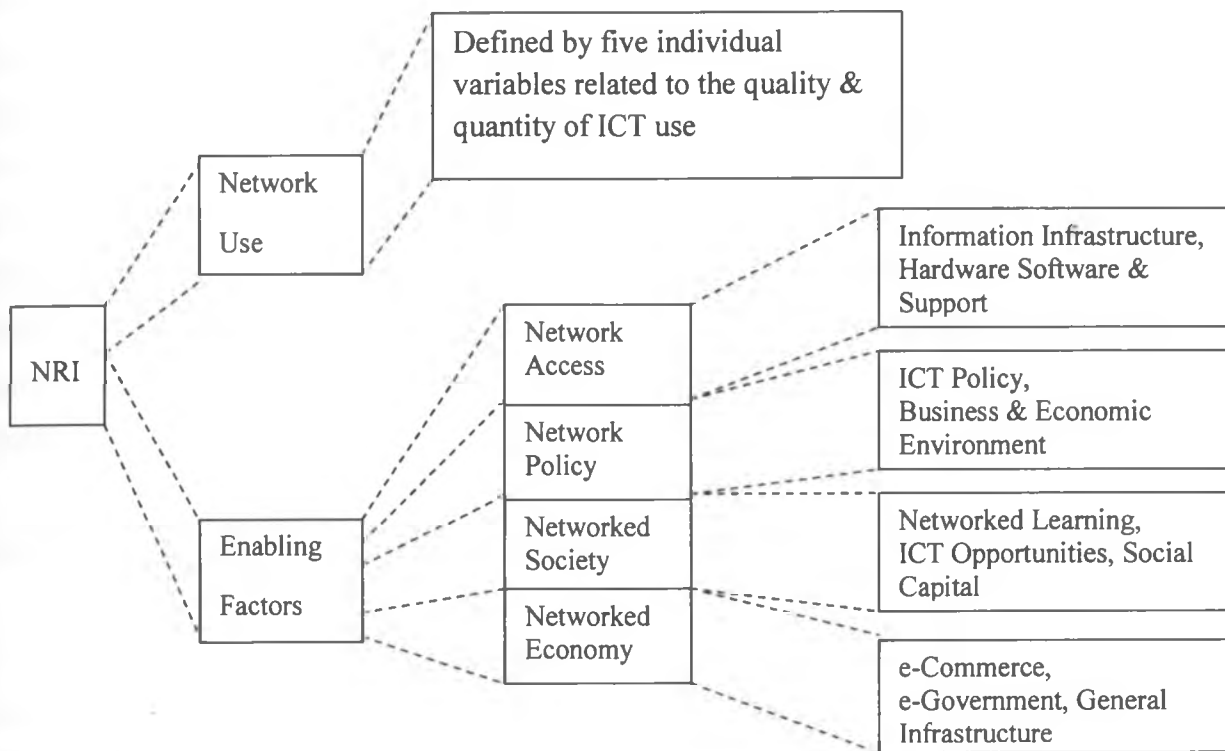
Figure 2.1:Network Readiness Index Framework

Source: Information Technology Group, CID at Havard University (2004)

Table 2.1: E-Banking Framework

	DOMAINS	INDICATORS
1.	**Access**	Infrastructure and Services
2.	**Capacity**	Social factors, Economic factors and Policy factors
3.	**Opportunities**	Opportunity penetration, Specific applications, e-banking, B2B and B2C,and Payment systems

Source: Maugis, 2004

If we consider e-banking as a test case of this streamlined approach, it is likely that some e-Readiness factors are more informative than others, and, it would be useful to know what factors are critical, for which profiles, why and how. At the same time, e- readiness profiles are not fixed; they are subject to investments, policy, and a host of contextual socio-economic factors.

Given this variability (and flexibility) different countries can and do embark on different pathways toward greater e-readiness in general or toward e- readiness targeted toward a specific opportunity. It is fair to ask: *Profiles* of what precisely. *Pathways* from where and for what? and for what type of opportunities? In the context of e-banking, the table above shows e-readiness in terms of domains and clusters/ indicators. This generic framework allows us to hypothesize, for example that: If *access* conditions are in place, then *capacity* considerations come into play. *If* both access and capacity are in place, *then* value creation *opportunities* can be pursued. In other words, there can be no viable *opportunity* creation in the absence of access and capacity conditions.

2.4.3 E-readiness of Higher learning institution in Kenya

A study funded by partnership for Higher Education in Africa developed an integrated conceptual framework that borrowed concepts from the NRI, CID and GDI frameworks to analyze e-readiness of higher learning institution in Kenya. The integrated framework, at the highest level, has five dimensions as follows.

i).   Network Access covering four indicators, namely - information infrastructure, internet availability, internet affordability, network speed and quality.

ii).   Networked campus with two indicator, namely - network environment-campus

iii).   Networked learning has four indicators, namely - enhancing educations with ICTs, developing the ICT workforce, ICT research and innovation in libraries.

iv).   Networked society has four indicators, namely - people and organization online, locally relevant content, ICTs in everyday life and ICT in the workplace.

v).   Institutional ICT policy and strategy has three indicators, namely - ICT strategy, ICT financing and ICT human capacity.

This study assessed the level of preparedness of higher education institution in Kenya to use ICT in teaching, learning, research and management. Indirectly, it also assed the capacity or e-readiness of these institutions to use electronic learning (e-learning) to improve quality of education and ultimately increase access to higher education in Kenya.

2.4.4 VERDICT and E-Commerce

VERDICT –Verify End User e-readiness. This model was developed to measure e-readiness of specific industry sectors to adopt internet technologies. It measures the readiness level of organization to adapt and use e-commerce. VERDICT is a combination of two models namely BEACON (Benchmarking and readiness assessment for concurrent engineering in construction) and IQ NET readiness scorecard which was developed by CISCO and is a web-based application that assesses an organisation's ability to migrate to an internet Business model. Although these models are the bases of VERDICT, they differ from VERDICT in the case of their applications, in that the BEACON model focuses on Concurrent Engineering (CE) and the IQ Net Readiness, while the Scorecard addresses the readiness of technology companies (e.g. software companies, vendors and ASPs) to develop applications and profit from what is termed the e-economy, VERDICT assesses the readiness level of organizations to adopt e-commerce technologies (Ruikar, 2006). VERDICT adopts a methodology where the end-users are presented with a set of statements and an assessment of their e-readiness is based on their responses. On completion, the respondents are presented with a report, which includes textual and graphical data. Also VERDICT relies on, the judgment of the respondent (or end-user) as to whether or not he/she agrees with the statement/s in the context of their organization, department or work group. The respondents need to ensure that their responses are consistent with their assumptions e.g. if the responses are in the context of the department (and not the organization), then that assumption must be consistently reflected throughout (Ruikar et al 2005). The framework has four main categories –

a) People - who have adequate skills, understanding of, and belief in, the technology;

b) Processes - that enable and support the successful adoption of the technology;

c) Technology -tools and infrastructure necessary to support the business functions (e.g. processes and people);

d) Management -that believes in the technology and takes strategic measures to drive its adoption, implementation and usage in order to derive business benefits and opportunities from the technology.

All four categories are considered important for an organization to be e-ready. VERDICT has a set of questions for each of these categories .In each question a statement is given. The statements and respondents choose only one choice among six possible answer ones for each statement due to their agreement or disagreement with the statement. VERDICT relies on the judgment of the respondents (or end-users) as to whether or not they agree with the statements in the context of their organization, department or work group. The e-readiness is staged using the traffic light that is Red, Green and Amber.

2.4.5   Electronic Banking (E-Banking) and Microfinance

The selected literature indicates that there is a rapid increase in the use of ICT and ICT enabled services in the provision of financial services ranging from operational processes thus reducing drastically paper based process to paperless; to service delivery through ATMs, Electronic Funds Transfer (EFT), telephony such as M-PESA by Safaricom and zap by Zain (Kenya), internet and point of sale devices, among others. Maumbe et al (2006) indicate that ICT has become a key component of most, if not all, financial institutions operations and service delivery and networks the world over and drives their effectiveness and efficiency innovations and efforts. In order to expand market share and increase access, and keep in line with national and global trends and competition, financial institutions have embraced ICT and ICT enabled services in their businesses. The poor perceive the rise of digital banking as key to providing new solutions to improve access to financial services.

Kumar et al (2006) did a study on correspondent banking in Brazil, where financial institutions set up commercial establishment using third party agents rather than their own branches, with a

different primary focus where the third party renders services on behalf of the financial institution using modern and innovative technology such as Point of Sale (POS) devices. Correspondent banking was found to have allowed increased outreach to the un-banked, mainly the poor, profitably with risk sharing. Regulatory changes were found to have spurred the growing popularity of correspondent banking mainly in the payments area. The study also found that the potential for replication is high, with Prodem in Bolivia and Banco Azteca in Mexico having successfully followed the Brazilian model with 30 and over 800 correspondent partnerships from gas stations to supermarkets in 2005 and 2002, respectively. The study suggest that the future of correspondent banking using appropriate technology and innovations like the POS devices as in Brazil, Bolivia and Mexico are likely to continue to rise and be replicated across various countries but with increased risks faced by financial institutions, their customers and retailers (agents) must not be forgotten.

Waterfield (2004) in Moderation of a Virtual Conference by MicroSave noted that e-banking for the poor depends on technologically driven delivery channels and methodologies, while commercialization solutions rely on other factors including skills and capabilities, e-readiness to use and adapt to modern and innovative technology by the business and their actual and potential clients, access to ICT and ICT service providers and vendors, managing relationships with multiple implementing partners, literacy levels in society, and marketing and distribution strategies, among many others. The conference concluded that it is possible to build huge functionality onto an e-banking infrastructure including deposit taking, withdrawals, bill payments, money transfer services, internet banking, e-money using telephony, air time top up and pension payments, among many others.

Several studies and literature including Ketley, R et al (undated) have established that mobile phone based solutions have great potential particularly in emerging markets including Africa due to several factors such as:

- The African markets are not saturated with alternative payment and distribution channels e.g. ATMS, POS, branches and agency arrangements.

- Cell phone ownership and distribution is high, while computerization and internet access is relatively low especially at the low end market segments (poor, low-income households and MSEs).
- Poor infrastructural facilities such as roads, electricity and rail often make communication difficult.
- Cheque and electronic funds transfer usage is very low with poor coverage.

Based on these factors, the literature concluded that ICT and ICT enabled services could therefore play a major role in the provision of financial services. In Kenya, the use of mobile phone as commence to pick momentum with the launch of M-PESA and Zap money transfer services by Safaricom and Zain mobile phone providers, thus confirming the potential of mobile telephony.

Hussein et al (2001) found that outsourcing of ICT is another emerging development within the financial sector and MSEs ICT is increasingly playing an important role but there exist lack of competencies in this organizations. MSEs were also found to have difficulties in attracting and retaining killed human resources to handle ICT effectively and efficiently, thus raising issue of their e-readiness to use and adopt modern and innovative ICT.

RQB: What key factors determine the e-readiness of MFIs to use ICT in their operations and activities and in serving their customers based on existing literature and findings?

Table 2.2: Summary of Tools and Frameworks Reviewed

CATEGORY	INDICATORS	TOOL
NETWOK ACCESS	Infrastructure	CSPP; CID; APEC; NRI; McConnel; Readiness for banking; E-readiness for higher learning institutions; VERDICT
	Access to Services	CSPP; CID; Readiness for higher learning institutions; Readiness for banking
NETWORKED ECONOMY	ICT employment opportunities	CID; Readiness for banking; NRI; APEC; Mc Connel; E-readiness for higher learning institutions
	Payments	Readiness for banking
	E-banking	Readiness for banking; CID
NETWORK POLICY	Institutional ICT policy & strategy	Readiness for banking; McConnell international report; APEC; CID tool; NRI; E-Readiness of higher learning institution
	ICT Human Capacity	VERDICT & E-commerce; McConnell international report; APEC; CID tool; NRI; E-Readiness of higher learning institution
	ICT financing	E-Readiness of higher learning institution; McConnell international report
NETWORKED SOCIETY	Clients & MFIs online	CID tool; NRI report; E-Readiness of higher learning
	ICT in every day life	CID; NRI; E-Readiness of higher learning
	ICT in MFIs(workplace)	CID; NRI report; E-Readiness of higher learning

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Conceptual Research Framework

There exist various frameworks/ tools for determining e-readiness with different measurable indicators like internet, telecommunication infrastructure, environment and availability of computers. To find the most appropriate tool for the goal of this research, it was necessary to consider that the final goal of this research is to evaluate the e-readiness level in the microfinance industry in Kenya.   Therefore, the needed framework should be a combination of some e-readiness assessment models that work in both national level and industry or sector level. Early e-Readiness studies generally assume a fixed, one-size-fits-all set of requirements, regardless of the characteristics of individual countries, the investment context, industry or the demands of specific applications (Maugis.V. et al, 2004).

The researcher adopted an Integrated Conceptual Framework using concepts from the CID E-readiness Tool, a report by Kenet e-readiness in learning institutions in Kenya and e-readiness for banking by Maugis.V.et al (2004). We used these E-readiness approaches to form the basis of identifying the categories and indicators for our e-readiness assessment study of the microfinance industry in Kenya.

3.1.1   Adaptation of CID tool for assessment of MFIs in Kenya

The proposition that no one size seldom fits all reflects in our view that no one single question can address all the complexities of the e-Readiness domain. Indeed, the relevant questions as well as the strategies for producing answers are driven by who is asking that question, why, and for what purposes.

The CID tool is an example of an e-society tool that measures the ability of the overall society to benefit from ICT (Bridges, 2001). The CID e-readiness tool titled "Readiness for the networked World : A guide for developing Countries" is an instrument that systematically organizes the assessment of numerous factors that determine the networked readiness of a community in the developing world. The Information Technology Group at the Centre for International Development (CID), Harvard University developed this framework. To make it applicable for this study, there was need to modify it. There is no one correct method to use the Guide; each community should determine how the guide best addressees its own needs. Depending on the resources and goals of the community, the assessment process and results will vary in detail, depth and scope (CID, 2001).

The original CID tool specified 19 indicators. However, some of the indicators are not relevant for microfinance institutions in the Kenyan context. The indicators of enhancing education with ICT and schools access to information and communication technologies are not relevant to the MFIs. Apart from eliminating some of the 19 indicators, we introduced three new indicators and renamed two indicators. MFIs is a sector in the banking industry, hence the two indicators in CID tool weren't applicable, from the MFIs perspective policy strategy is mainly concerned with ICT environment.

The proposed framework consists of four main categories indicated below:

Table 3.1: The proposed E-Readiness Framework

CATEGORIES	INDICATORS
Network Access	Basic Infrastructure
	Access to necessary services
Networked Economy	ICT Employment Opportunities
	Payments
	E-banking
Networked Society	Clients and Organization Online
	ICT in Everyday Life
	ICT in the MFIs
Network Policy	Institutional ICT Policy and Strategy
	ICT Human Capacity
	ICT Financing

3.1.2 The Proposed E-Readiness Assessment Framework for MFIs in Kenya

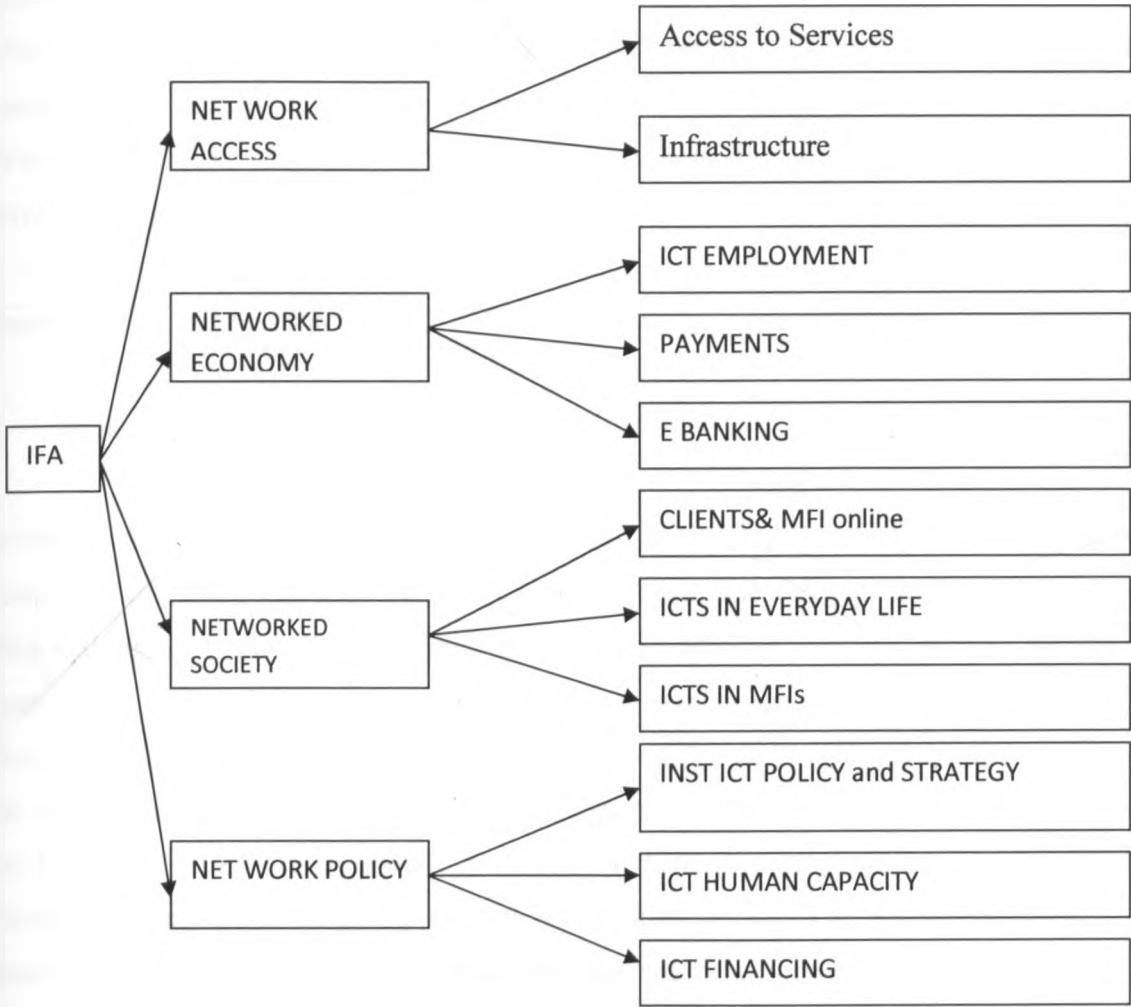The proposed assessment tool is as indicated below.

Figure 3.1: The Proposed E-Readiness Assessment Framework

The following is a brief explanation of these categories and indicators

(a)   Network Access Category of Indicators

These are conditions related to enabling physical connectivity i.e. infrastructure. Proper functioning and affordable communication networks are therefore essential conditions for the development of e-business, particularly e-banking. *Infrastructure* is measured using three sub-indicators, namely –internet availability, network speed and quality, hardware and software. *Access to necessary services* This refers to how we use connectedness to make it meaningful and

purposeful especially its ability to adopt and use ICT. The Network World is all about how we are able to adopt and use the Network to make our lives better, jobs more meaningful, time more well spent, people smarter and communications stronger, healthier and safer. Beyond the availability of affordable, high-quality basic communication services e-business will also depend on the capacity, availability and pricing of value-added services which provide applications such as access to the infrastructure, and content hosting. The more affordable the access to these services the greater the penetration. These services are provided by internet service Providers.(ISPs)

H1 = basic infrastructure and access to necessary services have significant and positive influence on MFIs network access.

(b) Network Policy Category of Indicators

Network Policy relates to ICT environment such as policy strategy, business environment and resource availability, particularly economic factors. There is need for competitive and conducive policy environment/ climate. *ICT Policy and Strategy* addresses strategic planning for ICT, the Champion of ICT and the organizational structure, regulations and impediments on business enterprise growth and e-commerce. An organization need to have ICT policy strategy that suits their business and plan that is tightly linked to corporate strategic plan and opportunities. On the other hand, *ICT Financing (Economic Environment) Indicator* measures the degree to which an institution has sufficient budgetary allocation and other resources to adopt and use ICT. The framework defines ICT budget allocation and the source of organizational ICT budget and resources. *ICT Human Capacity (Business Environment) Indicator* measures the degree to which an institution has competent and well trained ICT professionals and support staff to execute e-business tools.

H2 = ICT policy and strategy, ICT financing and human capacity indicators have significant and positive influence on MFIs network policy category.

33

(c) Networked Economy Category Indicators

Business enterprises that are able to effectively employ ICT to enhance their service delivery in an efficient and effective manner, while developing more sophisticated and efficient ways of managing their external relationships and communications. This growing ICT adoption and usage has helped, and is expected to continue to revolutionize the critical mass of electronic transactions, which support networked opportunities. Measures extend to which ICT has been incorporated into organizations business activities such as the use of the World Wide Web and Internet in their business transactions. These indicators will address questions that include, for example: What specific opportunity is being considered for MFIs in Kenya? If, for instance, the opportunity considered is e-banking, what is the intended goal? Is it the goal to increase efficiency, outreach and sustainability of the MFI or foster institutional development? These indicators include ICT employment opportunities, payment systems and e-banking opportunities. Specifically –

- **ICT Employment Opportunities:** A thriving economy means good business for business enterprises hence a thriving job market for ICT professionals provided added incentive for growth of ICT adoption and overall adoption and use of ICT within the organization for value added services and exploitation of emerging opportunities.

- **Payment Systems**: Electronic payments options by financial institutions and/ or retail options enhance clients' choice and access to services and products. They also allow businesses to reduce costs associated with physical infrastructure and transaction costs. Electronic payments such as telephony delivery channels such as M-PESA by Safaricom and Zap by Zain in Kenya, internet and point of sale devices, among others, are specific payments opportunities

- **E-banking** – E-banking arises when financial institutions adopt and us modern and innovative ICT based payments systems and electronic transactions channels in the provision of banking business (savings, lending, money transfer, etc.). In this case, the opportunities include provision of e-banking by MFIs using ICT driven delivery channels and

34

methodologies. ICT enabled services in the provision of financial services range from operational processes thus reducing drastically paper-based process to paperless; to service delivery through electronic means such as the adoption and usage of ATMs, POS, mobile phones, third party agents and card-based transactions. When organizations move their dealing with other organizations online, they can often communicate more easily at lower costs; hold smaller inventories and process payments quickly, among other advantages.

H3 = employment opportunities, payments and E-banking indicators have significantly and positively influence the MFIs networked economy category.

(d)   Networked Society Category Indicators

The networked society category measures the readiness of the MFIs and MFIs clients to adopt and use ICT for their day-to-day business activities and operations. There are three indicators here, which include use of ICT in every day life, online services by clients and MFIs and ICT in MFIs work place/ environment. Specifically –

- **Clients and MFIs Online** - As more MFIs gain an online presence, it becomes more likely that the clients will also adopt and use ICTs to carry out their activities and needs. One of the key drivers of online growth is availability of affordable technology, adaptability and awareness. Here sub-indicator is demographics of internet use by MFIs and clients.

- **ICT in Everyday Life** - Clients participate more directly in the networked world when information devices, such as telephones, computers and radios, etc. are generally and culturally accepted and incorporated into daily life. Here the sub-indicators are clients or family member owning phone or computer or any electronic device use for payments or communications in daily life activities such as access and use of computers, computer village centre's and cybercafés, etc. In communities where income or infrastructure cannot support high levels of individual access to ICT for everyday life like in Kenya, cybercafés and computer network village centre as those proposed by the Government provide a much-needed alternative.

- **ICT in MFIs (work place)** - It measures readiness and usage of ICT at work, which includes use of e-mail and internet for internal and external communications and official duties.

H4 = the use of ICT by clients, ICTs in every day life and ICT in MFIs in Kenya have a significant and positive influence on networked society.

This generic framework allows us to hypothesize that: If access conditions are in place, then policy and society' e-readiness considerations come into play. If, policy and society e-readiness are in place, *then* value creation and *networked economy* can be pursued. In other words, there can be no viable *networked opportunities* creation in the absence of policy, society's e-readiness and access conditions.

3.2 Research Methodology and Data Collection

3.2.1 Research Approach

A positive aspect of the quantitative approach is that it is rather more proper to generalize from the gathered information. However, according to (Kombo, 2006) it must be kept in mind that gathered information should always be relevant for the problem definition based on our research questions we selected the quantitative approach due to my research purpose, which required me to analyze data statistically.

3.2.2 Population and Sample

There are many institutions providing microfinance services in Kenya, including but not limited to commercial banks, SACCOs, MFIs, and ASCAs and ROSCAs, among others. Some of these institutions provide only lending facilities, while others provide a wide range of financial services from lending, savings/ deposit mobilization, micro-insurance and money transfer services, among others, where permitted. However, the exact number (population) of all MFIs in Kenya is unknown. However, for the purposes of this study, the population will consist of all MFIs in Kenya, which we have said is unknown for now. Given the time and resource

constraints, this study will use a representative sample of selected MFIs and their clients from the population.

The Association of Microfinance Institutions (AMFI) has 34 member institutions (Central Bank of Kenya, 2007), of which 30 are retail MFIs carrying out near banking activities, while the other four are insurance companies and wholesale MFIs. This study therefore, proposes that the 30 AMFI retail MFIs become our representative sample for the population. The basic idea of sampling is that by selecting some elements in the population, the researcher may draw conclusions about the entire population. Traditional sampling method can be divided into two categories: probability and non-probability sampling (Kombo, 2006). The assumption here is that AMFI members consist of large, medium and small MFIs, thus making them representative of the entire microfinance industry (population). The researcher also assumes that a sample of the clients of the selected 30 AMFI MFIs members will be representative of the entire microfinance industry clientele.

The researcher used the formula suggested by Kothari below to determine the sample size (Kothari, 2006). The researcher then applied the formula to determine the proportion, ρ, in the target population (entire clients of MFIs) that will be a representative sample to possess the characteristics being measured in the population. The 30 AMFI member MFIs as at December 2008 had 1.44 million clients (Central Bank of Kenya, 2008 Bank Supervision Annual Report). The researcher assumed that these clients of the 30 MFIs form the population of the microfinance industry given the time and resource constraints as well as the fact that the researcher could not have interviewed 1.44 million clients and that the research is an academic exercise. The researcher applied the formula to determine the desired sample size from this population of 1.44 million clients as follows.

$$n = \frac{Z\alpha^2 \, Np' \, (1 - p')}{(N-1)\delta^2 + Z\alpha^2 \, p(1 - p')}$$

$$n = \frac{1.96^2 \times 1440000 \times 0.44 \, (1 - 0.44)}{(1440000-1)0.05^2 + 1.96^2 \, 0.5(1 - 0.44)}$$

37

n = 252.27265 (Desired representative sample size)

With Zα = 1.96 at 95% confidence level

N = 1,440,000 (Universe or entire population)

δ = 5% (percentage of estimated population that is defective)

ρ = 0.5

ρ' = 0.05

The above formula resulted in a desired sample size of 252 clients as the minimum representative sample that the researcher must interview.

Using the same formula, we determined the sample size of the MFIs to be interviewed as follows:

$$n = \frac{1.96^2 \times 30 \times 0.44 \, (1 - 0.44)}{(30\text{-}1)0.05^2 + 1.96^2 \, 0.5(1 - 0.44)}$$

n = 24.73296

This means that we had to use at least 25 MFIs in out study. However, the researcher randomly sample 10 clients from each of the 30 AMFI member MFIs, which brings the study representative sample to 300 clients.

Kombo and Tromp (2006), noted that in descriptive research, the purpose is to describe the characteristics of a complex phenomenon or population, and the researcher conducting the study knows what to investigate but not the final answers. Exploratory research is appropriate when a problem is clearly structured and when intention is not to conduct research about factors related to cause/effect relationship (Zinkhan, 2002). An explanatory research could also be used where the study aims to explain certain phenomena from different perspectives or situations with given set of events (Yin, 2003). In this research and based on my research questions, first we strive to

find the most proper frame work as well as the factors affecting e–readiness level in MFIs. Therefore, the prime part of our research is exploratory. Then we described the discovered pattern and we analyzed the collected data in order to show the differences and similarities. However, this research used both exploratory and descriptive research methodologies.

3.2.3 Data Collection Method

In this research, since our study was analyzing existing theories, then it was deductive in nature. In order to understand the research area more and in detail, the necessary data must be collected (Yin, 2003). There are two types of data, secondary and primary data. Data that has already been collected, by other researchers for another purpose, is called secondary data (Saunders, 2000). Primary data is data that a researcher collects on his/her own for a specific purpose (Yin, 2003). When collecting data, the researcher has to choose between using question methods; like questionnaire, personal interview, using observation or documents (Saunders, 2000). In this regard, documentation is mostly used to collect secondary data. For example, statistics, registrations, official publications, letters, diaries, newspaper, journal, branch literature and brochures can be used for collecting secondary empirical data. Yin (2003) brings up six different sources of evidence that can be used when collecting data for case studies, namely: documentation; archival records; interviews; direct observations; participant observations and physical artifacts as indicated in Table 3.2, which gives the strengths and weaknesses.

Based on the nature of our research and considering the above discussions, we chose to collect data information from both primary and secondary data sources. We collected primary data through questionnaires and secondary data in terms of documentation, by gathering information from written reports, articles and especially from official and related websites of MFIs. This complementary information was intended for describing the industry. Also for getting the best result in measuring the e-readiness level within MFIs Industry, before starting data gathering process from the AMFI members and their clients. The recommended questionnaires were pre-tested using a panel of experts and Chief Executive Officers (CEOs), general managers and top ICT managers of three selected MFIs.

3.2.4   Pilot Test

Piloting can be done together, either in focus groups or individually in informal Interviews (Yin, 2003). Internal discussions with various MFIs senior managers could help to see if the categories and levels are meaningful in MFIs point of view. In addition, it was necessary to screen understandability of questionnaire. The finalized questionnaire consisted of 38 questions. The procedure of pilot test was to distribute the questionnaires and collect them. Piloting of the questionnaire was done on 7 MFIs and 5 clients from each of the selected MFIs. Screening internal consistency checked the reliability of responses. Ultimately After the changes were carried out the data collection started. The procedures of data collection as well as calculating the coefficient of Cronbach's Alpha for whole questionnaire was 0.93 ($\alpha = 0.93$) that proved strongly the reliability of the questionnaire.

3.2.5   Data Analysis

In order to answer the research questions, the data collected needs to be thoroughly analyzed. Yin (2003) explains that every investigation should start with a general analytic strategy, allowing the researcher to decide what to analyze and why.

The selected MFIs and clients were given questionnaires to fill. The information and data colledted was analyzed using SPSS and Excel to describe and explore the factors determining e-readiness in MFIs and needs of the MFI clients.

3.2.6   Validity

According to Kombo (2006), the issue concerning validity is whether the persons who answered the questionnaire were the ones possessing the most accurate and valuable information for the study. So the researcher directly aimed as respondents the Chief Executives, ICT and General Managers of MFIs because they are the ones who possess the most accurate and complete information with regard to the research problem and the MFIs business operations, business environment and ICT applications.

3.2.7   Reliability

Reliability demonstrates the extent to which the operations of a study, such as data collection procedures can be repeated with the same results. A measure is considered reliable if a person's score on the test if given twice will yield similar results (Kombo, 2006). This type of reliability is referred to as Test – Retest. Test and retest simply put, is that you should get the same result on test 1 as you do test 2 when the two tests are administered after a time lapse. This reliability is time consuming. Test - Retest involves two administration of the measurement instrument (Yin, 2003).

The other type of reliability test is known as Half-Split.   In this reliability test, a test is administered once.   The results of the test are split into two halves and the coefficient of correlation is calculated. If the reliability of the test is good, there should be a high correlation coefficient between the two responses. Cronbach (1949) cautiously declared that the split-half method might give confusing results unless the two half-tests are just as equivalent as parallel forms of the identical test would be. He mentions about two underlying assumptions of split-half method: firstly, the halves must have almost equal standard deviations and secondly, the halves must be alike in content. It is for this reason that split-half method is not suitable for this study that tries to examine different contents.   It is therefore appropriate to use Cronbach alpha coefficient (α) and not split-half method.

It is important to remember that reliability is not measured but estimated (Yin, 2006). Internal consistency estimates reliability by grouping questions in the questionnaire instrument that measure the same concept or indicator. For example, you could write two sets of three questions that measure the same concepts, and after getting the responses, run a correlation between those two groups of the three questions to determine whether the instrument reliably measures that concept or indicator. In order to get reliability of the questionnaire, we used coefficient of cronbach's Alpha for the whole questionnaire and all sets of questions related to each attributes by using SPSS software on the gathered data. The result obtained reflected accepted measures for alpha in all sets of the questions with an alpha of 0.93 (α = 0.93) for the entire questionnaire instruments. Therefore, getting this result the questionnaire had sufficient reliability as a data

collection tool. The explanation of this procedures and related statistical details is presented in the next chapter of data analysis.

CHAPTER FOUR

DATA ANALYSIS

In this chapter, the researcher presents a descriptive nature and characteristics of MFIsi and clients the results of the reliability and validity tests using factor analysis as well as the descriptive and regression analysis.

4.1   Analyzing the Conditions of MFIs and MFIs Clients Respondents in the Sample

In this first part of this chapter, the researcher presents a descriptive analysis of the MFIs and MFIs clients' respondents' in order to provide a better understanding of the nature and characteristics of the microfinance industry players and clients.

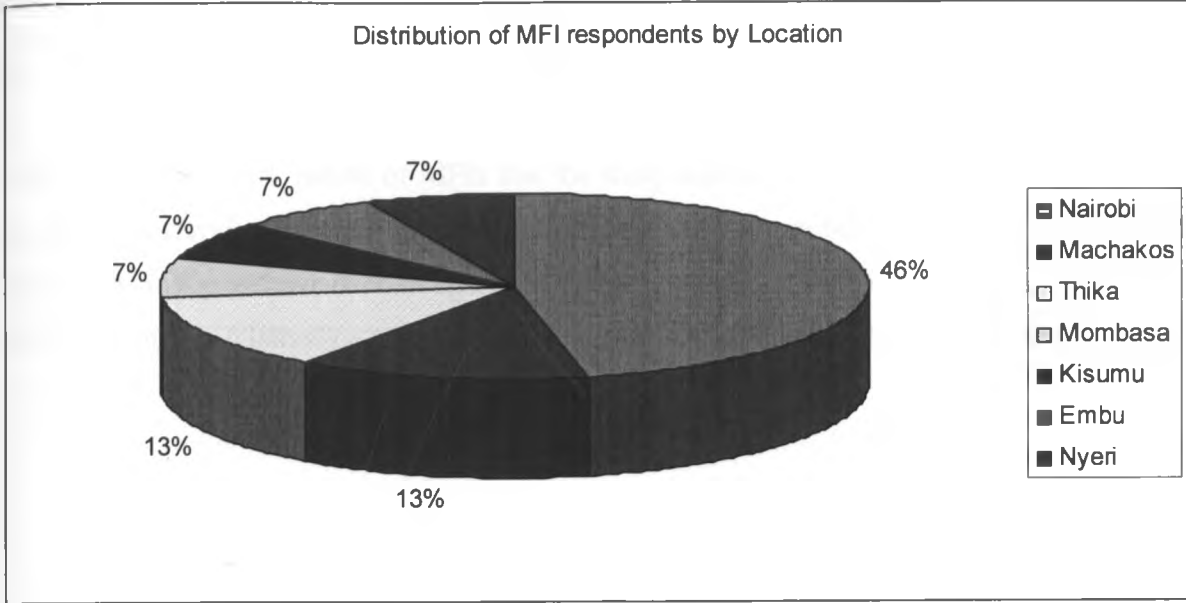### 4.1.1   Nature of MFIs

a)   Distribution of MFIs In Kenya
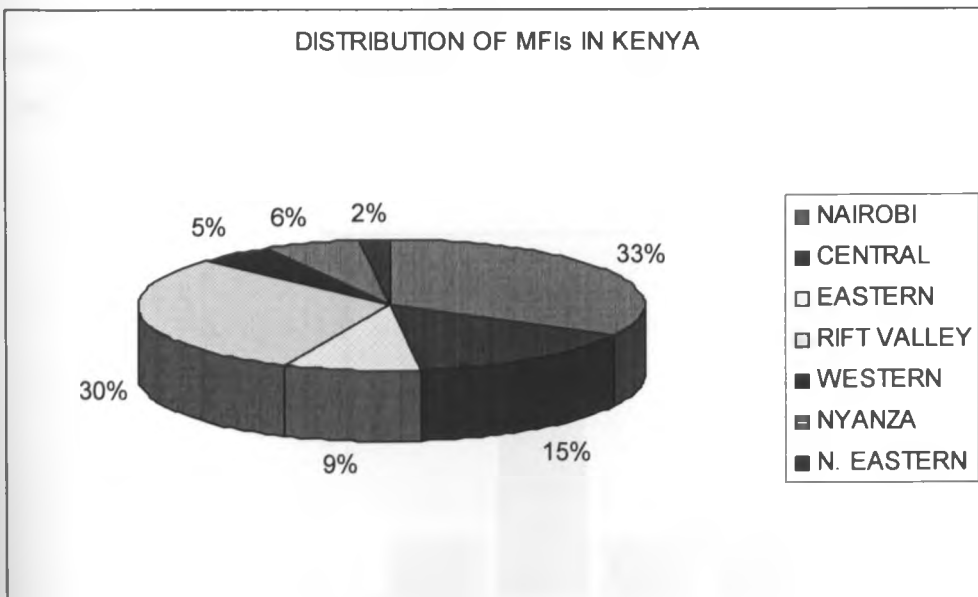
Figure 4.1: Distribution of MFIs in Kenya

b) **Distribution of MFIs Respondents By Location**

Distribution of MFI respondents by Location

Figure 4.2:Distribution of MFIs in Kenya By Location

c) **Type of registration**

It is important to understand under which legal framework the MFIs operate under, given the fact that the literature review indicated that they operate under different legal frameworks such as the Companies Act, Banking Act, Microfinance Act and Societies Act.
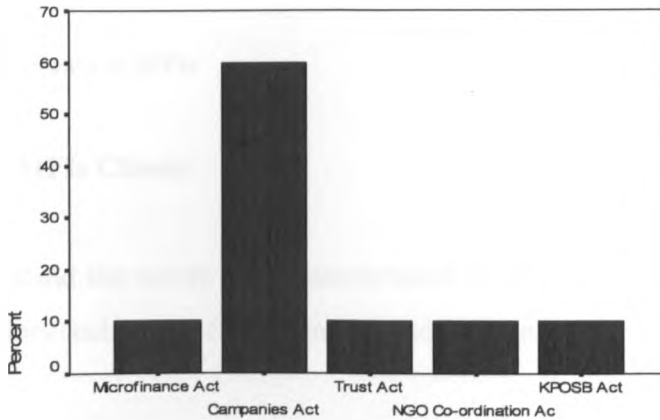
Figure 4.3: Types of MFI registration

44

The histogram above shows that 60% of the MFIs interviewed are registered under the companies act, while 10% each are registered under the microfinance Act, Trust Act, Non-Governmental Organizations Co-ordination Act and KPOSB Act.

d)   Duration of Existence

The other aspect in the nature of MFIs that the study assessed is for how long the MFI has been in operation carrying out the microfinance business. The figure below shows that 70% of MFI institutions in Kenya have been in operation for a period of less than 10 years. These suggest that MFIs in Kenya is relatively a new development with majority being about a decade old only.
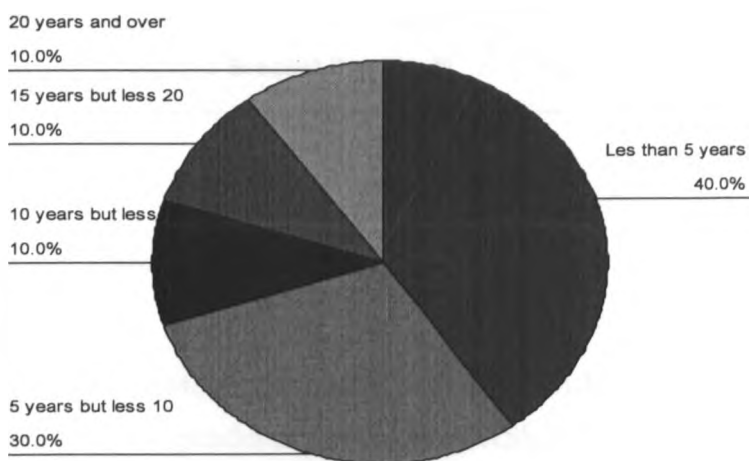

Figure   4.4: Duration of Existence of MFIs

4.1.2   Distribution of MFIs Clients

It is important to understand the nature and characteristics of the microfinance industry clientele looking at different factors such as education, gender and income levels.

a) Income By Gender

From Fig 4.5 the majority of the MFI clients were person who earn less than kshs 15,000 per month. In all the income brackets except in the income bracket of persons earning more than kshs 50,000, there are more women than men in all the categories.
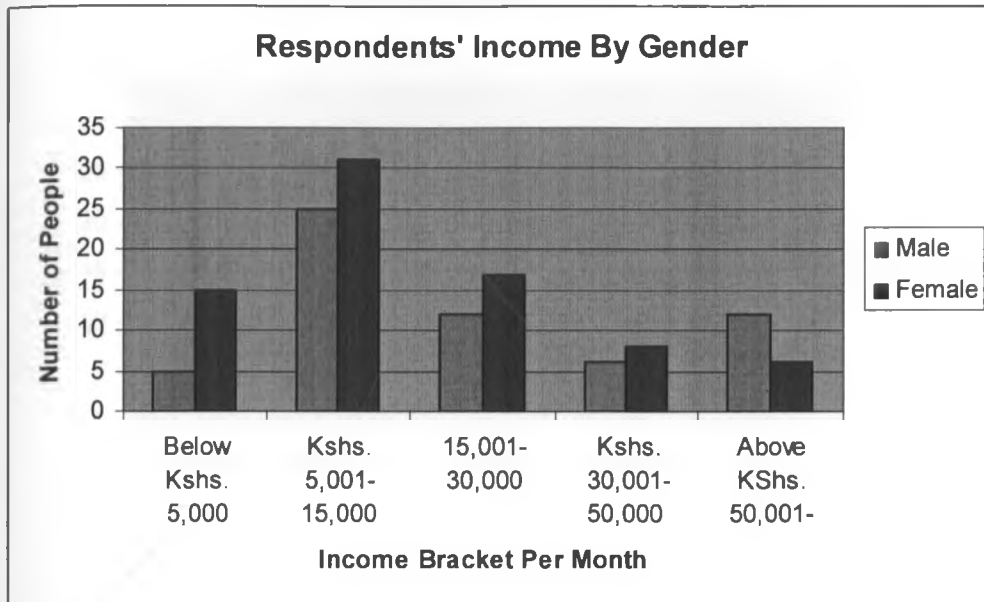
Figure 4.5: Respondent's Income by Gender

The other characteristic of MFIs clients and is distribution by income brackets. The findings indicates that 47% of the respondents earn between KSh.5,001 – 15,000, while 15% and 10% earn between KSh.15,001 – 30,000 and below KSh.5,000, respectively. This suggest that about 72% of MFIs clients earn below KSh.30,000, thus confirming the myth that MFIs mainly serve low income households and SMEs.

b) By Level of Education by Gender

The study also assessed the nature of MFIs clients according to the level of education. The findings indicate that almost an equal proportion of respondents, 34% and 30% have secondary and college education, respectively. While, 25% and 10% have primary and university education,

respectively. These findings suggest that MFIs mainly serve population with primary, secondary and college education.
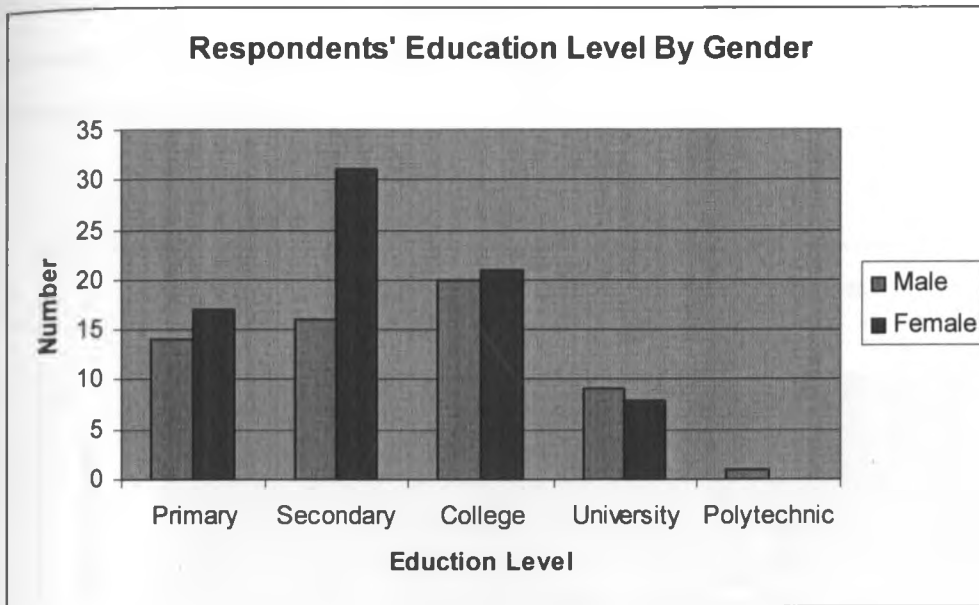

Figure 4.3: Education Level of respondent

4.2 Descriptive Analysis

Descriptive analysis attempts to provide a description of the nature and characteristics of the data information collected using statistical method such as frequency distributions. These descriptive analyses assesses the extent to which the respondent agrees or disagrees with statement in each question in the questionnaire instrument, which are graded on a scale of 1 to 5 in order of perspectives. The frequency distribution tables and histograms followed by a cumulative analysis is used to describe the frequency and percentages of each answer to questions of each category/ factors and as indicated in the Appendix D. The summary of frequency and percentages related to each category is indicated where the question numbers of each category as well as t-related mean scores are presented in the figures below. Besides summarized plots, some explanations follow each to clarify them better.

4.2.1 Network Policy

There are 14 questions in the questionnaire designed to measure "networked policy "attribute/ indicators. The following histogram indicating the frequency and percentages of different answers to each question in order to have a better sense of the data analysis with regard to the network policy attribute.
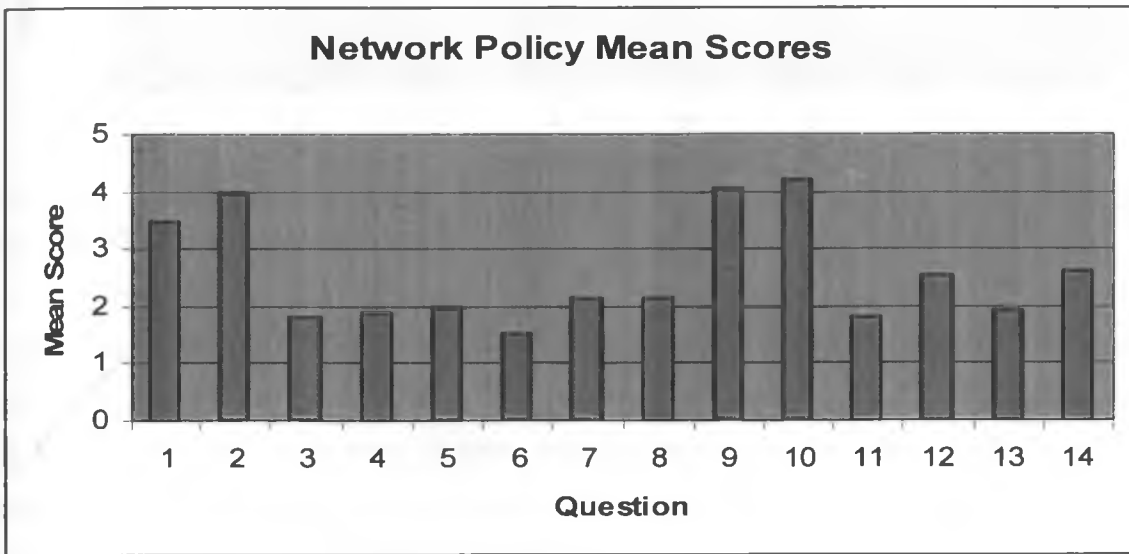

Figure 4.4:Network Policy Mean Scores of Responses to network policy category

For example, more than 80% of the respondents agree or strongly agree to the statements in question 1, 2, 9 and 10 as reflect by the highest mean score. In particular, question 10 depicts that MFIs major source of funding is internal and donor sources.

4.2.2 Network Access Category

There are eight (8) questions in the questionnaire, namely questions 16 to question 23 that measure the" Network Access" attribute. The results are depicted in the following histogram showing the frequency and percentages to different answers to the questions of this category.
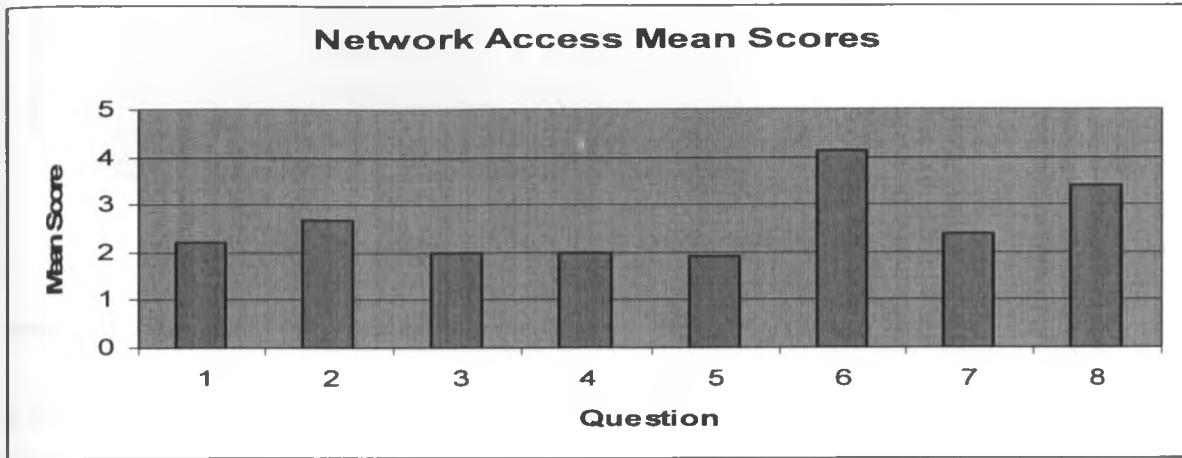
Figure 4.5: Network Access Mean Scores

The analysis of the questions that measures Network Access category show that among those questions, question 6 has the highest rate of agreement with a cumulatively 86% of respondents. This indicates that less than 25% of MFIs branches have access to digital wireless or other system such as direct PC. In question 7, only 46% of the respondents have average connection speed of between 57 to 384 kbps. The statement of question 2 with 46% respondents indicated that the organizational websites or addresses are regularly inaccessible, while 40% have no knowledge, thus resulting in an average mean score.

4.2.3 Networked Society Category

The following 8 questions measure the "network society" attribute, which are questions 24 to 31 in the questionnaire. Like the previous parts, the descriptive tables and histograms are provided to show the frequency and percentages of different answers to this category of questions.
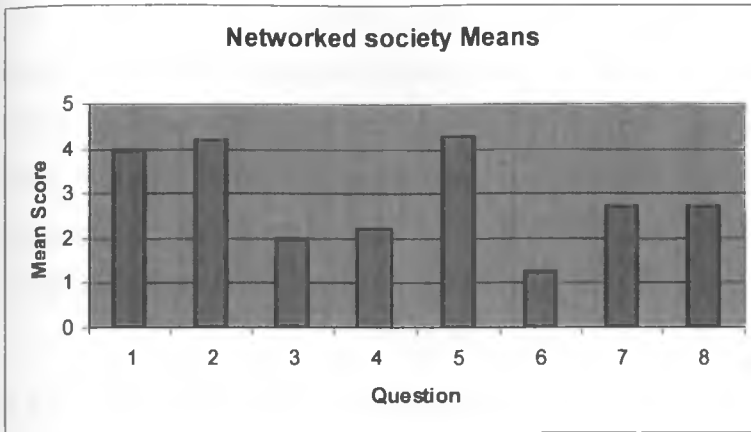
Figure 4.6: Networked Society Means

In the analysis of questions that measure the networked society attribute, the statistics shows that question 5 with the highest cumulative percentage of 93% has the highest rate of agreement (strongly agree). This means that 93% of MFIs clients don't use the internet to access MFIs services. While for question 6, the highest rate of disagreement with cumulative percent of 98% implying that most MFIs structure don't provide an environment that's well suited for internet use in serving their clients.

4.2.4 Networked Economy

Finally, the last 7 questions of the questionnaire (ranging from question 32 to question 38) measure the "Networked Economy" attribute.
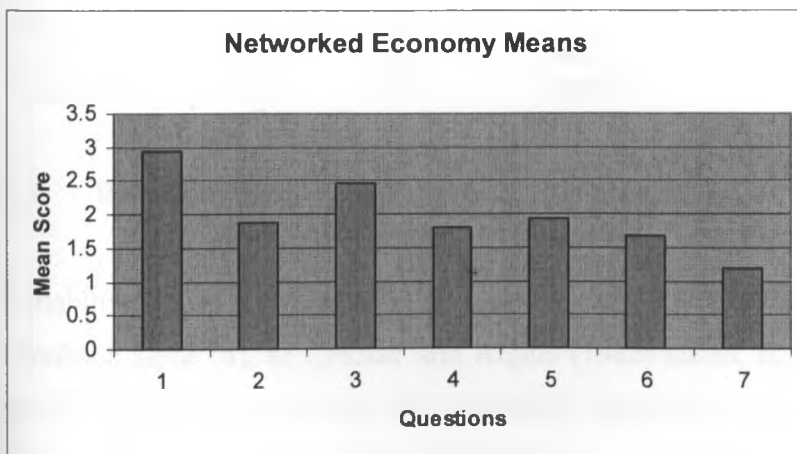
Figure 4.7: Networked Economy Means

The analysis of these questions that relate to networked Economy attribute results shows that question 1 has 48% cumulative percentage with the highest rate of disagreement, indicating that MFIS have not employed knowledgeable workers causing highest mean score. On the other hand, question 6 has a cumulative percentage of 83% with most disagreeing and strongly disagreeing with the statement showing that most respondents don't use the institution intranet to determine the status of their accounts.

4.3   Overall Correlation Matrix for the Four Categories

Correlation indicates the strength and direction of a linear relationship between two or more random variables. Correlation coefficients range from -1.0 to +1.0. The sign of the coefficient represents the direction of the relationship. The closer the coefficient is closer to 1.0, whether it is negative or positive, the stronger the relationship. In general, correlations of 0.1 to 0.3 are considered small, 0.3 to 0.7 are considered significant while those above 0.7 are considered large (Marczyk et al, 2005). The results below indicate that the categories have a correlation of above 0.3, which is the lower bound value for a significant relationship.

Table   4.1: Correlation Matrix of the Categories

	NETSOC	NETACCES	NETEOPP	NETPOLIC
NETSOC	1.0000			
NETACCES	.6055	1.0000		
NETECON	.3726	.8656	1.0000	
NETPOLIC	.6385	.9190	.8267	1.0000

4.4   Reliability Test

Reliability of the questionnaire was tested using the Cronbach's alpha coefficient (α). The Cronbach alpha (α), as Crocker and Algina (1986) stated, could be thought as the mean of all possible split-half coefficients and is generally applicable to any situation where the reliability of a composite is estimated. Since ICT indicators, scores are gathered from various factors, it is more suitable to use the Cronbach's alpha as an internal consistency reliability measure. The overall reliability (α) for the Integrated Framework of Assessment (IFA) was 0.9381.

Table 4.2: Cronbach Alpha

Chronbach's alpha reliability test and reliability analysis – scale (alpha)

Item - total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Alpha if Item Deleted
MA1	90.6000	352.2571	.2547	.9387
MA2	90.0667	351.3524	.3725	.9377
MA3	92.2667	329.0667	.8378	.9334
MA4	92.2000	321.4571	.8939	.9324
MA5	92.0667	324.4952	.8128	.9333
MA6	92.5333	332.6952	.8202	.9338
MA7	91.9333	333.3524	.7997	.9340
MA8	91.9333	325.9238	.8301	.9332
MA9	90.0000	345.2857	.4524	.9371
MA10	89.8667	347.2667	.5238	.9367
MA11	92.2667	321.2095	.8842	.9324
MA13	91.5333	325.9810	.7822	.9337
MA14	92.1333	322.9810	.8754	.9326
MA15	91.4667	334.6952	.7626	.9344
PE16	91.8667	325.9810	.8641	.9330
PE17	91.4000	334.1143	.7248	.9346
PE18	92.0667	329.9238	.8258	.9336
PE19	92.0667	316.3524	.8811	.9323
PE20	92.1333	329.8381	.7479	.9342
PE21	89.9333	371.3524	-.4394	.9425

PE22	91.6667	343.3810	.4955	.9368
PE23	90.6667	350.5238	.4223	.9374
PR24	90.0667	369.3524	-.3520	.9421
PR25	89.8667	355.9810	.2188	.9385
PR26	92.0667	368.7810	-.2903	.9424
PR27	91.8667	366.1238	-.1957	.9418
PR28	89.8000	357.0286	.1579	.9389
PR29	92.8000	356.7429	.2297	.9384
PR30	91.3333	331.6667	.6588	.9352
PR31	91.3333	339.6667	.4945	.9369
TE32	91.1333	332.2667	.6846	.9349
TE33	92.2000	349.6000	.4561	.9372
TE34	91.6000	360.4000	-.0054	.9407
TE35	92.2667	326.4952	.9113	.9327
TE36	92.1333	352.6952	.2926	.9382
TE37	92.4000	363.5429	-.1275	.9406
TE38	92.8667	363.9810	-.2044	.9401

Reliability Coefficients

Number of Cases = 15.0   Number of Items = 37

Alpha = .9381

4.5   Factorial Validity

Factorial validity was performed using factor analysis. Factor analysis is one of the most commonly used methods for data reduction. Factor analysis assumes that the underlying dimensions or factors can be used to explain complex phenomena. The process of factor analysis is as follows –

a) The first step in factor analysis is to produce a correlation matrix for all variables. Variables that do not appear to be related to other variables can be identified from this matrix.

b) The number of factors necessary to represent the data and the method for calculating them must then be determined. Principal component analysis (PCA) is the most widely used method of extracting factors. In PCA, linear combinations of variables are formed. The first principal component is that which accounts for the largest amount of variance in the sample, the second principal component is that which accounts for the next largest amount of variance and is uncorrelated with the first and so on. In order to ascertain how well the model (the factor structure) fits the data, coefficients called 'factor loadings' that relate variables to identified factors, is calculated.

c) Factor models are then often 'rotated' to ensure that each factor has non-zero loadings for only some of the variables. Rotation makes the factor matrix more interpretable.

d) Following rotation, scores for each factor can be computed for each case in a sample. These scores are often used in further data analysis.

Factor analysis is used to discover patterns in the relationships amongst variables and enables reduction of the number of variables into factors combined from these variables. Principal component analysis (PCA) is a statistical technique, which is used to replace a large set of variables by a smaller set of variables that gives the best representation of the larger set. PCA is, therefore, the most commonly used method for extracting factors in factor analysis. The critique presented in this note applies to PCA but should generalize to other extraction methods used in factor analysis.

This research study tested the validity of our data to factor analysis using the Kaiser-Meyer-Olkin method (KMO) of sampling adequacy. KMO indicates whether or not variables can be grouped into a smaller set of underlying factors. Values obtained in this test range from zero – 1. High values (close to 1) generally indicate that a factor analysis may be useful with your data. If

the values are less than 0.5, the results of the factor analysis probably will not be useful. The results of our KMO test gave a value of 0.749 as indicated in Table 4.1 below. This value is higher than 0.5 indicating that our data can be grouped using factors analysis. There are two types of factor analysis, exploratory and confirmatory. We used confirmatory factor analysis with PCA to test our indicators. The result of our indicators using factor analysis is presented in the section under generating.

Table 4.3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.749
Bartlett's Test of Sphericity	Approx. Chi-Square	47.513
	Df	6
	Sig.	.000

4.6 Analysis of Each Category's Indicators by Factor Analysis

Factor Analysis is a statistical approach that can be used to analyze interrelationship among a large number of variable and explain these variables and in terms of their common underlying dimensions (factors). According to Aminali (2007), the statistical approach involves finding a way of condensing the information contained in a number of original variables into smaller set of factors with minimum loss of information.

Factor Analysis is an analytical technique that is used to assess the number of factors and the loadings of variables. It allows for the explicit constraints of certain loadings to be zero. The questionnaire used in the research consists of four categories of network policy network access, network society and network opportunities the researcher has applied factor analysis to classify each category into some sub-categories that are in fact the indicators of the main categories.. The procedures of this classification as well as the related Cronbach's Alpha are described to show the reliability.

4.6.1 Indicators of Network Policy

Principal Component Analysis is a factor analysis method that provides unique solution, so that the original data can be reconstructed from the results. It looks at the total variance among the variables, so that the solution generated include as many factors as there are variables (Pallant, 2003).

Applying the Principal Component Analysis, the network policy category is divided into three indicators, which are the indicators of this attribute as indicated below.

Table 4.4: Rotated Component Matrix (a)

	Component		
	1	2	3
NP1			.858
NP2		.938	
NP3	.858		
NP4	.904		
NP5	.898		
NP6	.825		
NP7	.819		
NP8	.825		
NP9			-.745
NP10		.818	
NP11	.918		
NP13	.868		
NP14	.830		
NP15	.895		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A Rotation converged in 4 iterations. In the following tables the calculation of cronbach alpha proves the reliability of this classification.

The factor analysis resulted to the three indicators which are discussed below.

4.6.1.1   Institutional ICT Policy and Strategy Indicator

These consisted of questions 3, 4, 5, 6, 7, 8, 11, 13, 14 and 15.

Table 4.5: Cronbach alpha for Institutional ICT Policy and Strategy Indicator

R E L I A B I L I T Y   A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	NP11	1.8000	1.2071	15.0
2.	NP13	2.5333	1.1872	15.0
3.	NP14	1.9333	1.1629	15.0
4.	NP15	2.6000	.9103	15.0
5.	NP3	1.8000	1.0142	15.0
6.	NP4	1.8667	1.1872	15.0
7.	NP5	2.0000	1.1952	15.0
8.	NP6	1.5333	.9155	15.0
9.	NP7	2.1333	.9155	15.0
10.	NP8	2.1333	1.1255	15.0

Alpha =   .9663

4.6.1.2 ICT Human Capacity Indicator

This indicator consisted question1 and 9

Table 4.6: Cronbach alpha for ICT Human Capacity Indicator

R E L I A B I L I T Y   A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std. Dev	Cases
1.	NP1	3.4667	.8338	15.0
2.	NP9	4.0667	.8837	15.0

Alpha = .7097

4.6.1.3 ICT Financing Indicator

These consisted of questions 2 and 10.

Table 4.7: Cronbach alpha for ICT Financing Indicator

R E L I A B I L I T Y   A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std. Dev	Cases
1.	NP10	4.2000	.6761	15.0
2.	NP2	4.0000	.6547	15.0

Alpha =   .6843

4.6.2 Indicators of Network Access

Following the same Procedure, the Network access was divided into two indicators namely infrastructure and Access to services.

Table 4.8: Rotated Component Matrix(a)

	Component	
	1	2
NA16	.872	
NA17	.834	
NA18	.840	
NA19	.797	.429
NA20		.747
NA21		-.712
NA22	.771	
NA23		.882

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A rotation converged in 3 iterations.

The following tables shows the reliability of this classification through calculation of cronbach's alpha

4.6.2.1 Access to Services Indicator

Indicator Consisted of questions 21, 20, 23

Table 4.9: Cronbach alpha for access to services Indicator

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	NA20	1.9333	1.0998	15.0
2.	NA21	4.1333	.6399	15.0
3.	NA23	3.4000	.6325	15.0

Alpha = .5477

4.6.2.2 Infrastructure Indicator

Questions 16, 17, 18, 19, and 22 loaded to the Infrastructure indicator

Table 4.10: Cronbach alpha for access to Services Indicator

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	NA16	2.2000	1.0823	15.0
2.	NA17	2.6667	.9759	15.0
3.	NA18	2.0000	1.0000	15.0
4.	NA19	2.0000	1.3628	15.0
5.	NA22	2.4000	.9103	15.0

Alpha = .9005

4.6.3 Indicators of Networked Society

Following the same procedure, the networked society category was divided into three representative indicators namely Clients and MFIs, online (question 24, 28), ICT in everyday life (question 25, 27 and 31) and ICT in the MFIs (work place)(question26, 29, 30) as shown below.

Table 4.11: Rotated Component Matrix for Networked Society Category

	Component		
	1	2	3
NS24			-.777
NS25		.811	
NS26	-.694		
NS27		-.872	
NS28			.840
NS29	.786		
NS30	.881		
NS31		.501	

Extraction Method: Principal Component Analysis.   Rotation Method: Varimax with Kaiser Normalization. A rotation converged in 4 iterations.

The following tables shows the reliability of this classification through calculation of cronbach's alpha

4.6.3.1 ICT in Everyday Life Indicator

Table 4.12: Cronbach alpha for ICT in Everyday Indicator

R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

		Mean	Std Dev	Cases
1.	NS31	2.7333	1.0998	15.0
2.	NS27	2.2000	.7746	15.0
3.	NS25	4.2000	.5606	15.0

Alpha = .7347

4.6.3.2   Clients and MFIs Online Indicator

Table 4.13: Cronbach alpha for Clients and MFIs Online Indicator

R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

		Mean	Std Dev	Cases
1.	NS24	4.0000	.6547	15.0
2.	NS28	4.2667	.5936	15.0

Alpha = .5381

4.6.3.3 ICT in MFIs (Work Place) Indicator

Table 4.14: Chronbach alpha for ICT in MFIs (Work Place) Indicator

R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

		Mean	Std Dev	Cases
1.	NS26	2.0000	.7559	15.0
2.	NS29	1.2667	.4577	15.0
3.	NS30	2.7333	1.1629	15.0

Alpha =.7231

4.6.4   Indicators of Networked Economy

Following the same procedure, Networked category was divided into three representative subcategories/ indicators, namely, ICT Employment opportunities, Payments and e-banking.

Table 4.15: Rotated Component Matrix for Networked Economy

	Component		
	1	2	3
NO32			.797
NO33		.897	
NO34	.837		
NO35		.872	
NO36			.782
NO37	-.829		
NO38	.569		

Extraction Method: Principal Component Analysis.   Rotation Method: Varimax with Kaiser Normalization. A rotation converged in 5 iterations.

The following tables shows the reliability of this classification through calculation of cronbach's alpha

4.6.4.1 ICT Employment Opportunities Indicator

These indicators consisted of questions 32 and36

Table 4.16: Cronbach alpha for ICT Employment Opportunities Indicator

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std. Dev	Cases
1.	NO32	2.9333	1.0998	15.0
2.	NO36	1.9333	.7037	15.0

Alpha = .7958

4.6.4.2 Payments Channels Indicator

These indicators consists of questions 33 and 35

Table 4.17: Cronbach alpha for Payment Channels Indicator

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	No. 33	1.8667	.6399	15.0
2.	No. 35	1.8000	1.0142	15.0

Alpha = .7149

4.6.4.3 E-Banking Indicator

These indicators are represented by questions 34, 37 and 38 and the reliability analysis results is as indicated below.

Table 4:18: Cronbach alpha for E-Banking Indicator

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	No. 34	2.4667	.8338	15.0
2.	No. 37	1.6667	.6172	15.0
3.	No. 38	1.2000	.4140	15.0

Alpha =.6118

Now achieving all categories' indicators and their complete data, the data analysis procedure and the final results of this research will be brought in the next sections. Besides, achieving the empirical objects, the study will also aim to achieve the theoretical objects. In this regard, development of a structural model will be explained and its importance as well as the relations among IFA attributes will be analyzed and demonstrated.

4.8.1. Variable Definition

All attributes in this framework are defined to assess the e-readiness level of organizations due to literature. So Access, Policy, Society and Economy as the four IFA's categories which determine the overall level of e-readiness are divided into their indicators by factor analysis. Hereby these attributes as well as their related indicators are presented briefly:

- "Network Access" consisted of two indicators Access to services(with $\alpha = .54$) and Infrastructure (with $\alpha = .90$).
- "Networked Economy" consisted of three factors ICT Employment (with $\alpha = .79$), Payments (with $\alpha = .81$) and E-banking (with $\alpha = .71$).
- "Networked society" consisted of three factors Clients and MFIs Online (with $\alpha = .55$), ICTs in Everyday Life (with $\alpha = .63$) and ICTs in the MFIs Institution (with $\alpha = .72$).

- "Network policy" consisted of three factors namely Institutional ICT Policy and Strategy (with α =.97, ICT Human Capacity (with α =.61) and ICT Financing (with α = .78)

4.8.2 Testing the Proposed Framework

This will be done using regression analysis. For each of this variables check the value in the columned significant. This tells you whether this variable is making statistically significant unique contribution to the equation. This is very dependent to which variables are included in the equation and how much overlap there is among independent variable. If the significant value (p) is less than .05 the variable is making a significant unique contributions to the prediction of the dependent variable (Pallant, 2003).

Table 4.19: Regression Analysis showing the significant contribution by each indicator to the Related Category

CATEGORY	INDICATOR	SIGNIFICANCE VALUE(p)	SUPPORTED
NA	NA Access to services	0.012	Yes
	NA Infrastructure	0.000	Yes
NP	NP policy &strategy	0.000	Yes
	NP human capacity	0.005	Yes
	NP financing	0.08	No
NS	NS clients & MFIs online	0.282	No
	NS ICT in daily life	0.020	Yes
	NS ICT in MFIs work place	0.002	Yes
NO	NO Employment opportunity	0.001	Yes
	NO Payments	0.002	Yes
	NO E-banking	0.316	No

The importance of each indicator is shown on path diagram as the load of that indicator
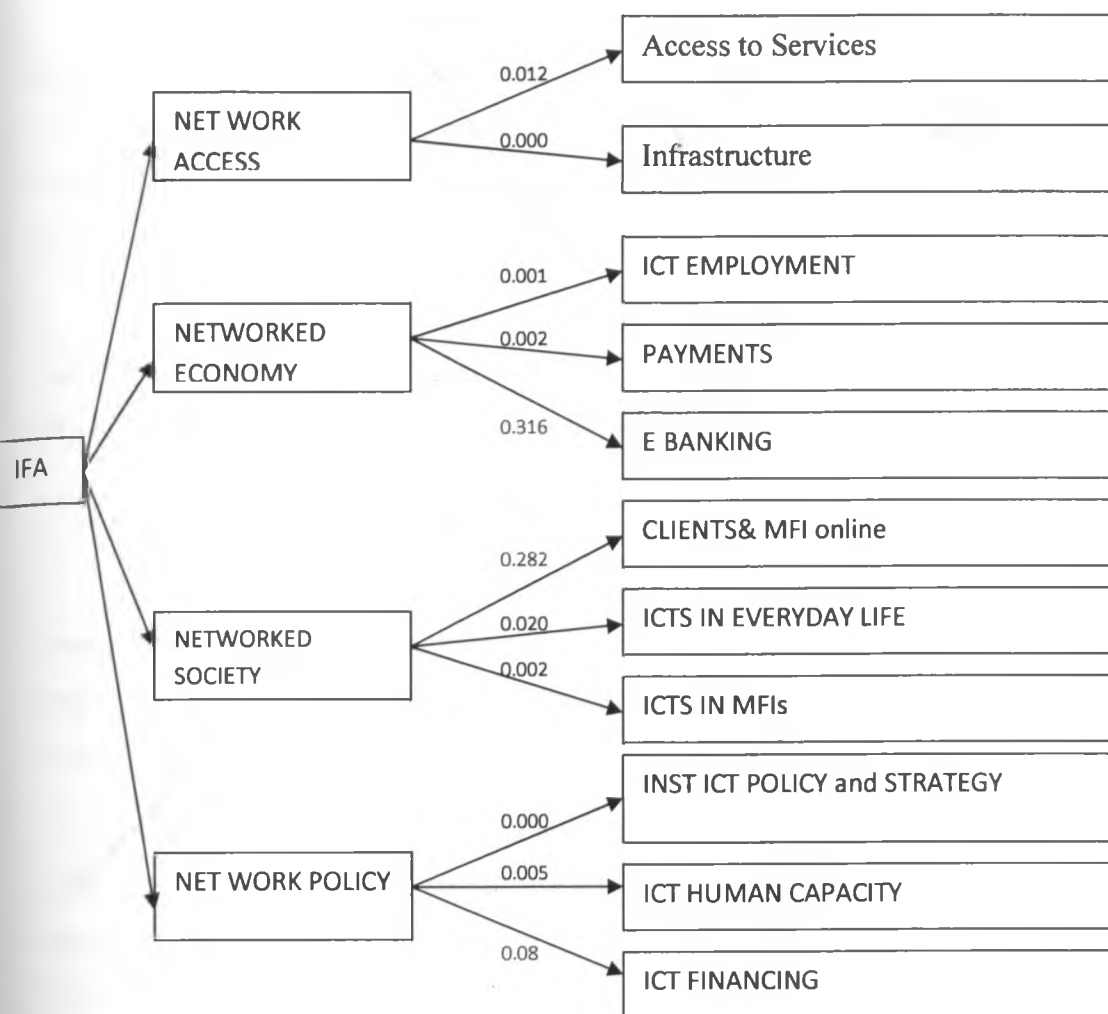
Figure 4.8: The Importance of Indicators in the IFA

4.8.2.1 Significant Results

- MFIs network access readiness is positively influenced by Access to Services (p=0.012), Infrastructure (p=0.000) this means that MFIs network access readiness will improve if Access to Services and Infrastructure of the internet are enhanced.

- MFIs network policy readiness is positively influenced by ICT policy and strategy (p=0.000) and also by human capacity (p=0.005). This means that a good policy and skilled human resource will increase the use of technology by MFIs in Kenya.

Networked Economy readiness is positively influenced by ICT employment opportunity ($p=0.001$) and payment opportunities ($p=0.002$) .This means that increased employment opportunity by MFIs will increase the demand for technical computer staff. Payment opportunities increase the use of delivery/payment channels thus increasing the MFIs networked economy.

Networked society readiness is positively influenced by ICT in every day life ($p=0.020$) and ICT in MFIs work place ($p=0.002$). This implies as there is increased use of ICT in every day life and in MFIs (work place) there is increased networked society.

4.8.2.2 Insignificant Results

Network economy e-readiness is not significantly affected by e-banking ($p=0.316$).This means that a decrease in E-banking activities will not significant decrease networked economy readiness. This can be due to the current situation where many MFIs aren't involved in many banking services, the e-banking sector in Kenya is not mature.

Networked society readiness is found not to be significantly influenced by clients online ($p=0.282$).This means if the clients use of internet decrease, networked society e-readiness significantly will not slow or decrease. This can be attributed to low internet penetration in Kenya and little rural Internet access.

Network policy readiness is not significantly influenced by ICT financing ($p=0.08$).this means that the MFI network policy readiness will not decrease significantly due to a reduced ICT financing. The budget allocation of ICT project is not adequate and ICT has not been recognized as a key sector in many organizations.

In summary these three indicators may not cause significant changes to their respective categories.

4.8.3 Tested IFA

RQC: What is the appropriate framework for assessing e-readiness in MFIs based on existing frameworks

From the literature review and after carefully testing of the categories and indicators of the proposed framework using the data collected from the field, fig 4.12 shows the developed framework fro assessing e-readiness of MFIs in Kenya.
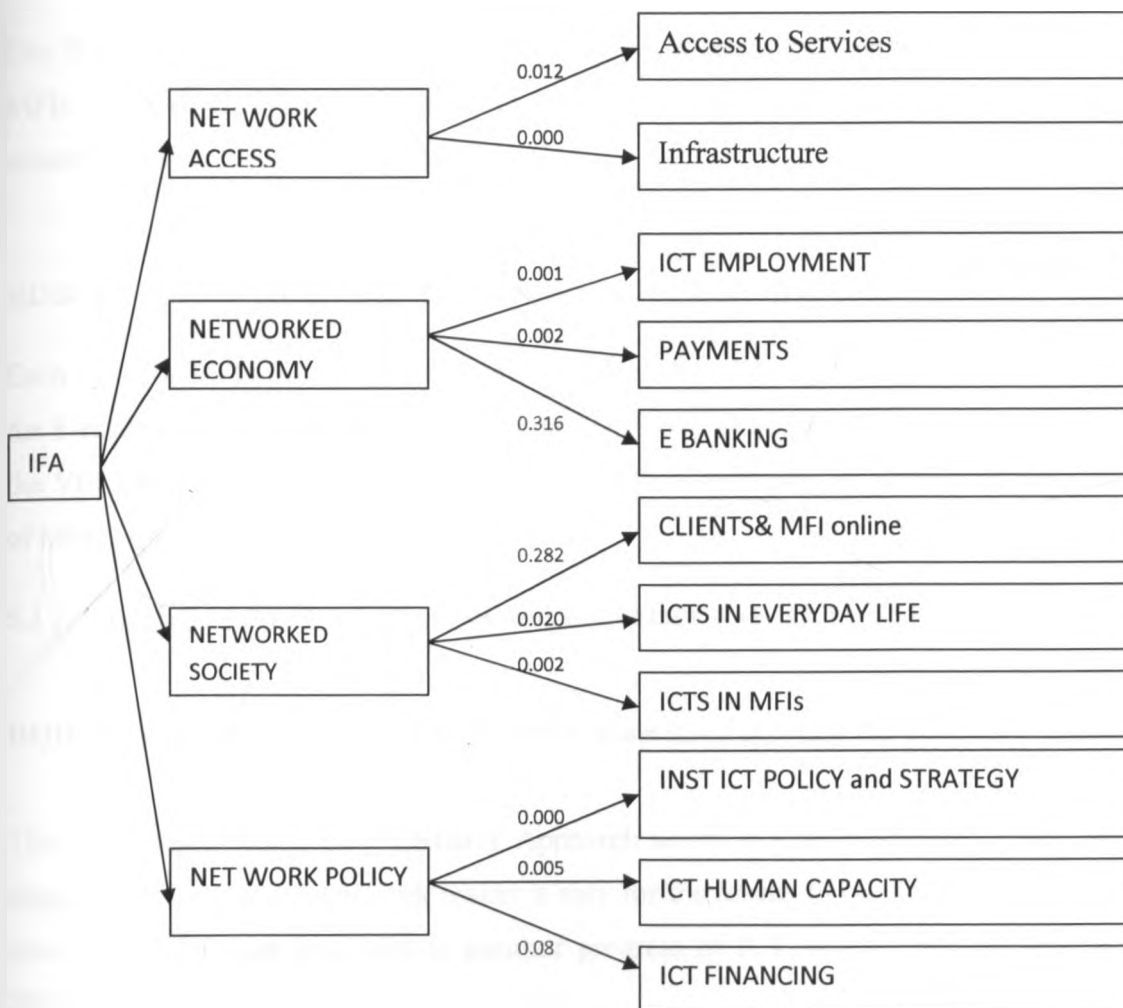
Figure 4.9: Tested IFA

CHAPTER FIVE

EVALUATION OF THE DEVELOPED FRAMEWORK (IFA)

The IFA was then evaluated by using it to assess the e-readiness level of a cross-section of some MFIs. Consequently, this chapter will be used to answer the research objective ROB and research question RQD as follows:

ROB: To evaluate the developed framework in the Kenyan context.

Each of these MFIs filled a questionnaire. The results of the questionnaire were used to assess the E-readiness assessment of these individual MFIs. This section will start with explaining how the VERDICT is used followed by the results of the e-readiness assessment of the cross-section of MFIs.

5.1 Staging of the IFA Categories and Indicators Analysis using Verdict Approach

RQD: How the E - Readiness level of MFIs is assessed through the developed framework

This will be done using the VERDICT Approach which is a diagnostic tool. Using the Verdict diagnostic e-readiness framework makes it easy for the results to be used at an institutional ICT strategy development level and to monitor progress of ICT strategy implementation (Ruikar, 2003).

5.1.1 Explaining the VERDICT Procedure

The VERDICT tool assesses the e-readiness level of an organization to adopt e-commerce technologies (Ruikar, 2006). In VERDICT, a questionnaire is used to collect information regarding the state of an organization in relation to their readiness to utilize ICTs to conduct business. The responses from these questionnaires are converted in scores under the broad categories of the areas considered.

The scores are averaged and depending on the average score, the respondents are presented with traffic light indicators, namely Red, Amber and Green to visually indicate their e-readiness in each Category. Red is an average score greater than or equal to zero and less than 2.5. Red indicates that several aspects within a category need urgent attention to achieve e-readiness. On the other hand, Amber is an average score greater than or equal to 2.5 and less than 3.5. Amber indicates that several aspects within a category need attention to achieve e-readiness. While, Green is an average score greater than or equal to 3.5 and less than or equal to 5 is green. Green indicates that the end-user organization has adequate capability and maturity in these aspects and therefore e-ready (in those respects).

Table 5.1 Guideline of Verdict's Boundaries

Range	Traffic Light	
$3.5 \leq X \leq 5$	Green	●
$2.5 \leq X < 3.5$	Amber	●
$0 \leq X < 2.5$	Red	●

5.2   E-Readiness Assessment

The following discussion will be an e-readiness assessment on a number of sampled MFIs. To arrive at the sample, we used the alphabetical list of the MFIs. The alphabetical list had fifteen MFIs, we picked the first, the third, the sixth, the ninth, the twelfth and the fifteen. For purposes of privacy, the sampled MFIs were coded MFI 1 to MFI 5.

5.2.1   MFI 1
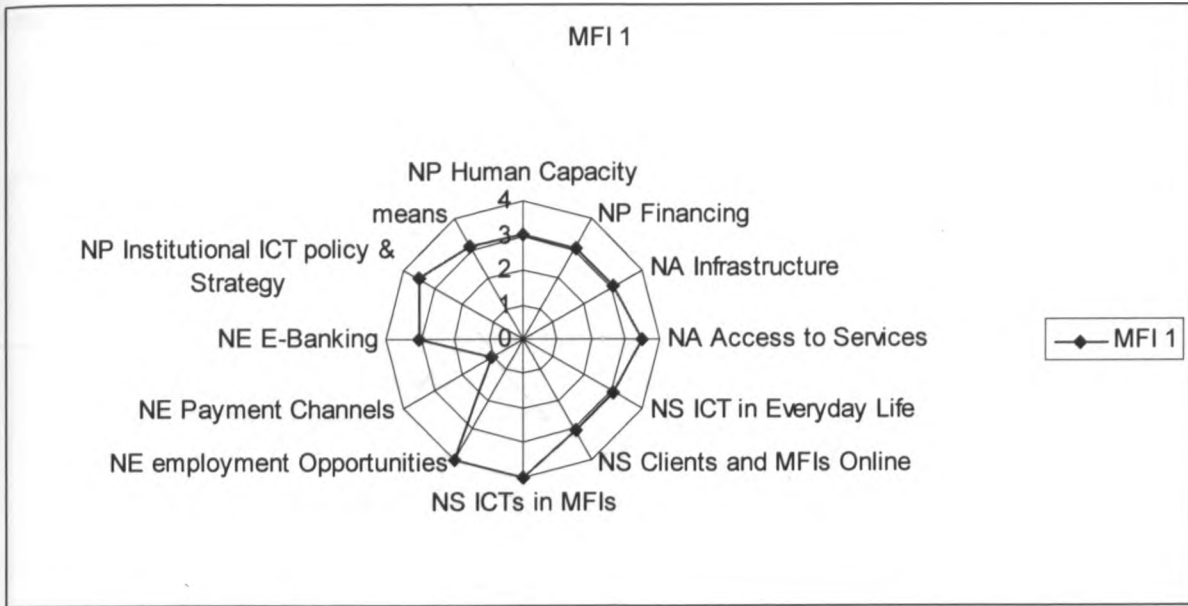
Figure 5.1: E-Readiness for Indicators of MFI 1
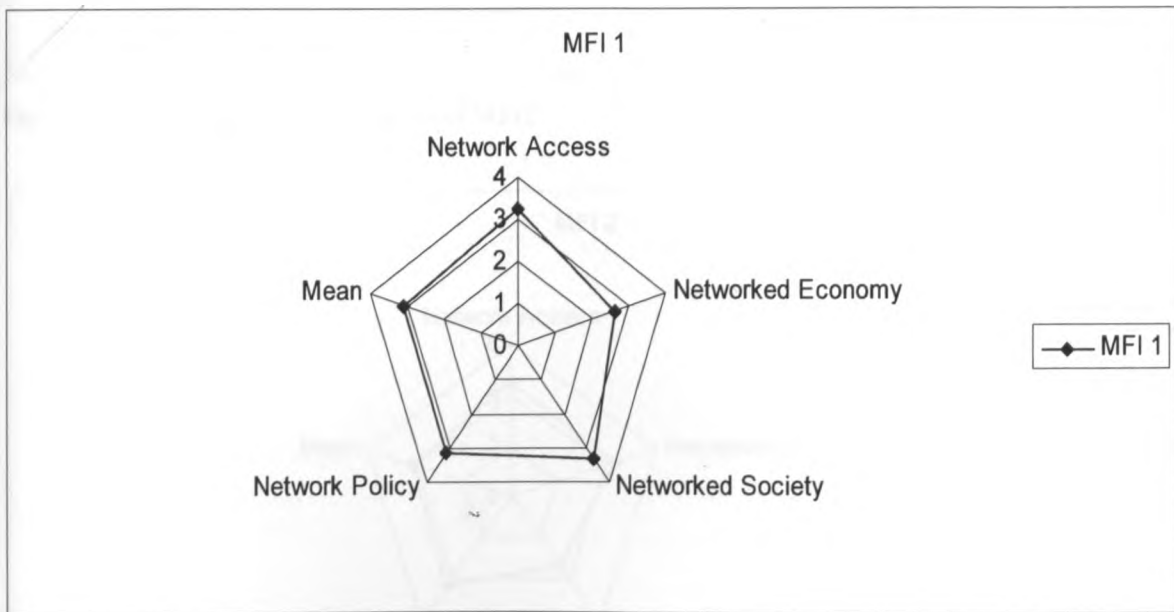
Figure 5.2: E-Readiness for Categories of MFI1

Fig 5:2 above indicates that MFI 1 is Green in all the categories indicating that it is E-Ready. The overall e-readiness of MFI 1 from the means of the categories is 3.54 indicating that it is ready. MFI 1 is registered under the Microfinance Act.

5.2.2 MFI 2
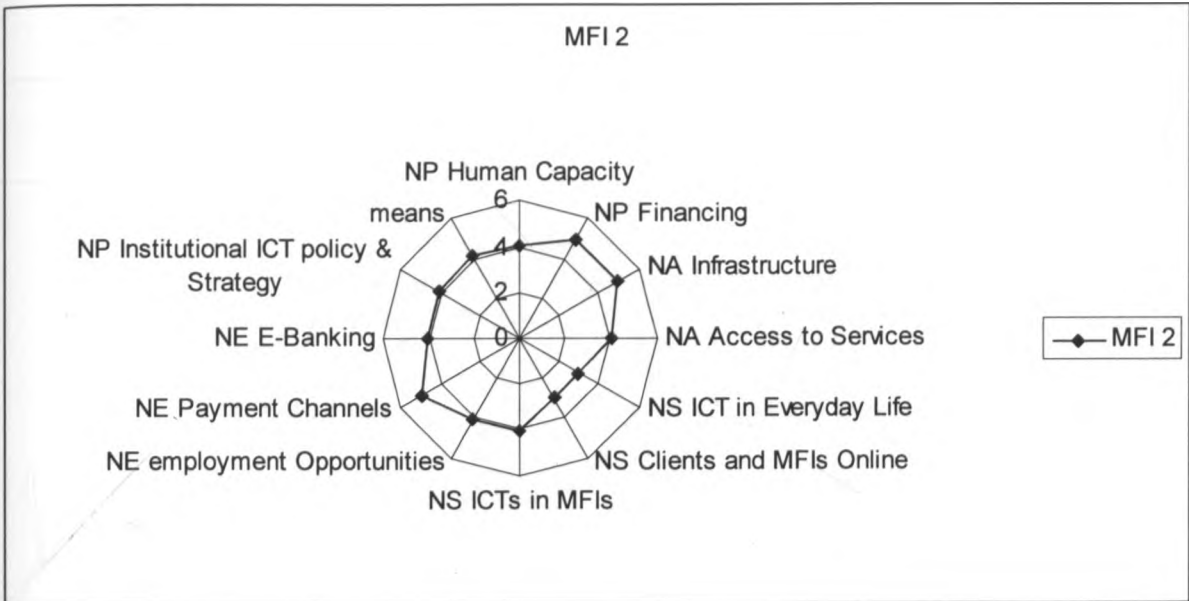
Figure 5.3: E-Readiness for Indicators of MFI2
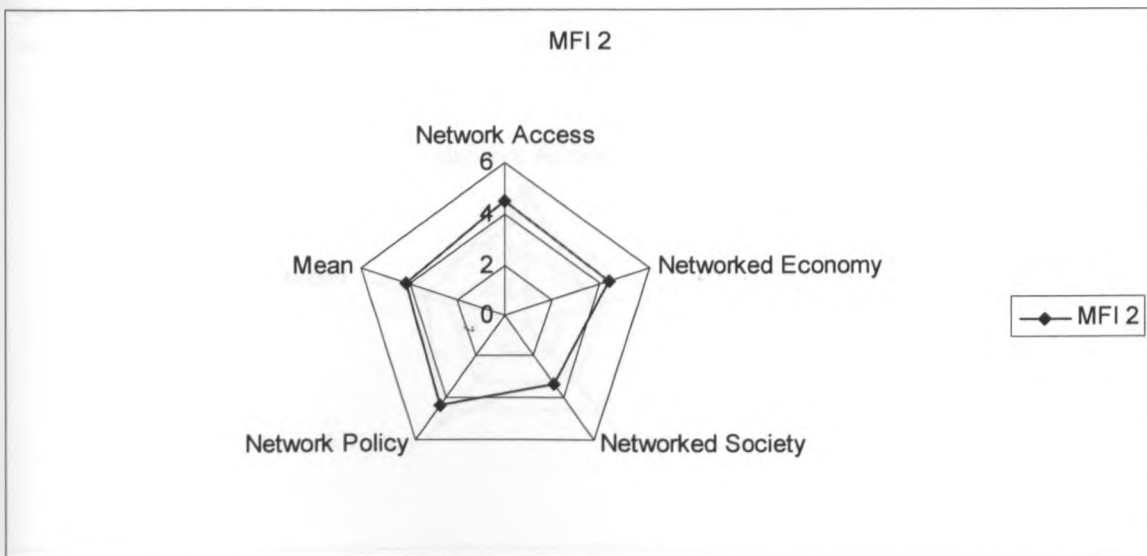
Figure 5.4: E-Readiness for Categories of MFI2

According to Fig 5:4, MFI 2 has the means of all its categories at 4 and above indicating that they are E-Ready. The overall e-readiness of MFI3 is 3.71. This indicates that Equity is e-ready since this value falls in under the green region of the VERDICT boundaries. The MFI 2 is registered under the Banking Act.

5.2.2 MFI 3
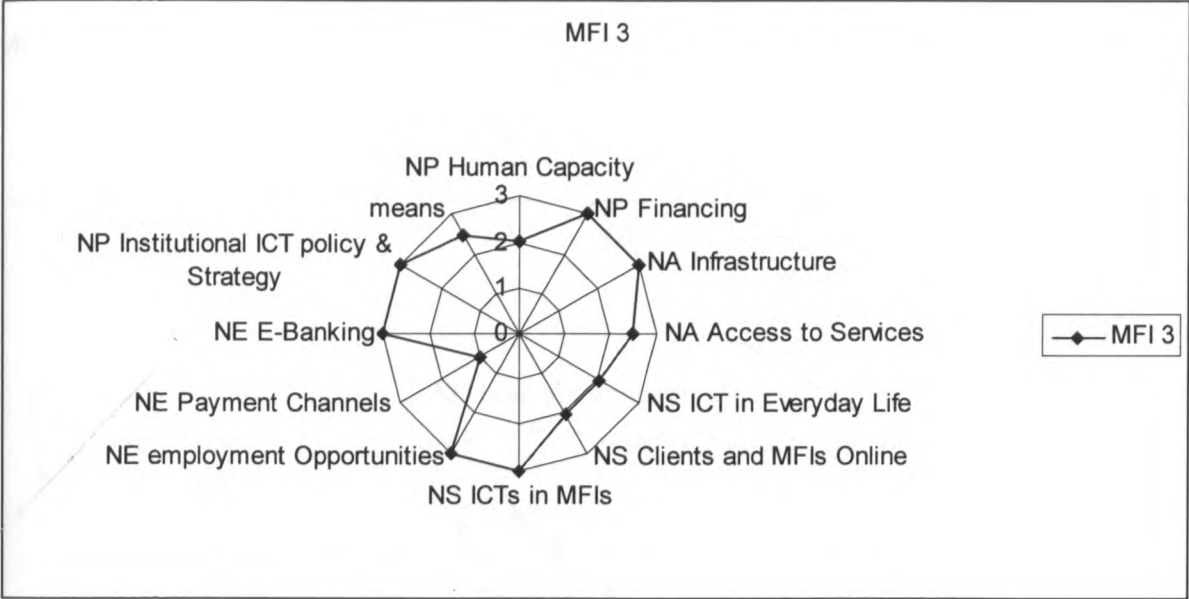
Figure 5.5: E-Readiness for Indicators of MFI3
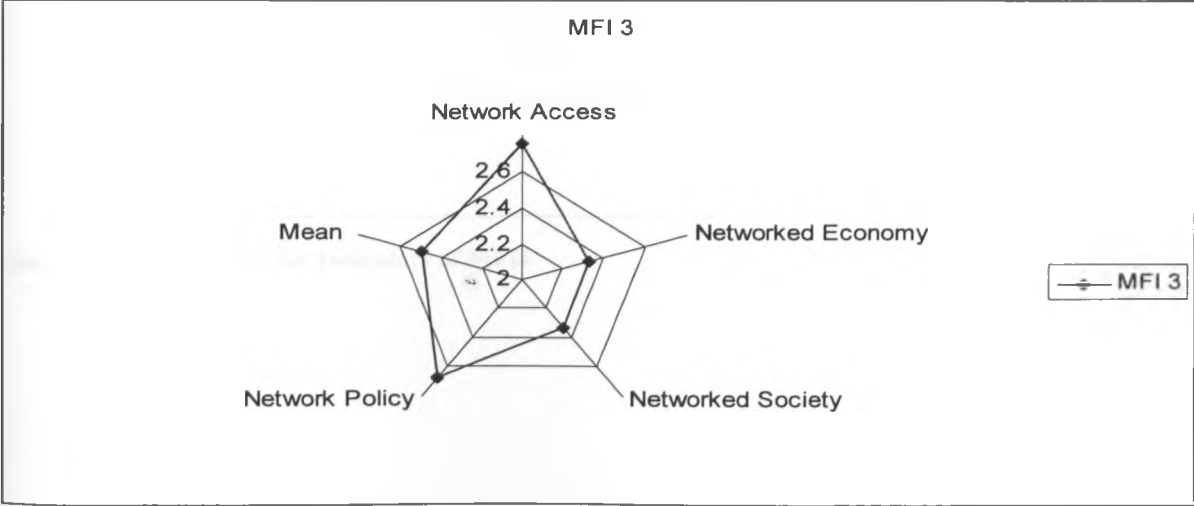
Figure 5.6: E-Readiness for Categories of MFI3

According to Fig 5:3, MFI 3 is has the categories of Network Policy and Networked Economy in the red region of the VERDICT boundaries. This indicates that they is urgent need to address these areas to achieve e-readiness. The other two categories, i. e. Network access and Networked Society were found to be in the amber region. The overall e-readiness from the means of the categories gives a value of 2.52, indicating that this organization is the amber region indicating that several aspects of e-readiness such as network access and networked society are average, while network policy and networked economy are serious intervention areas. MFI 3 is registered under the NGO Act.

5.2.3 MFI 4
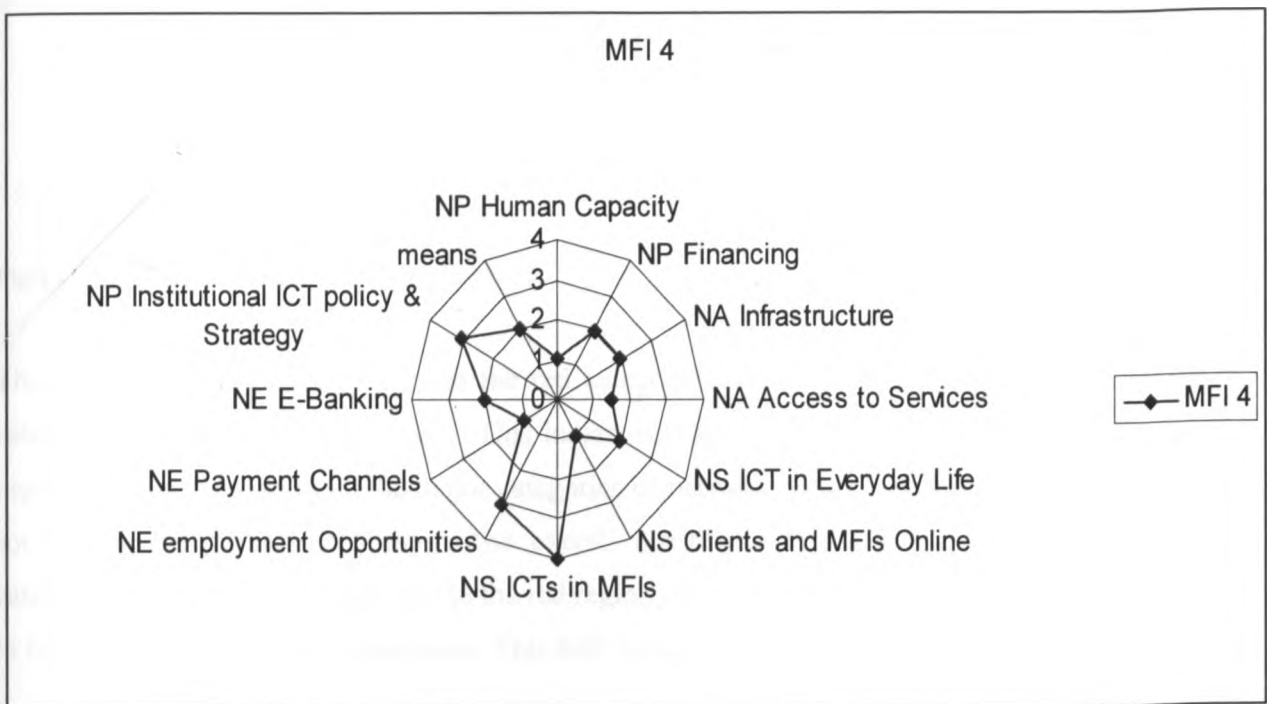
Figure 5.7: E-Readiness for Indicators of MFI4
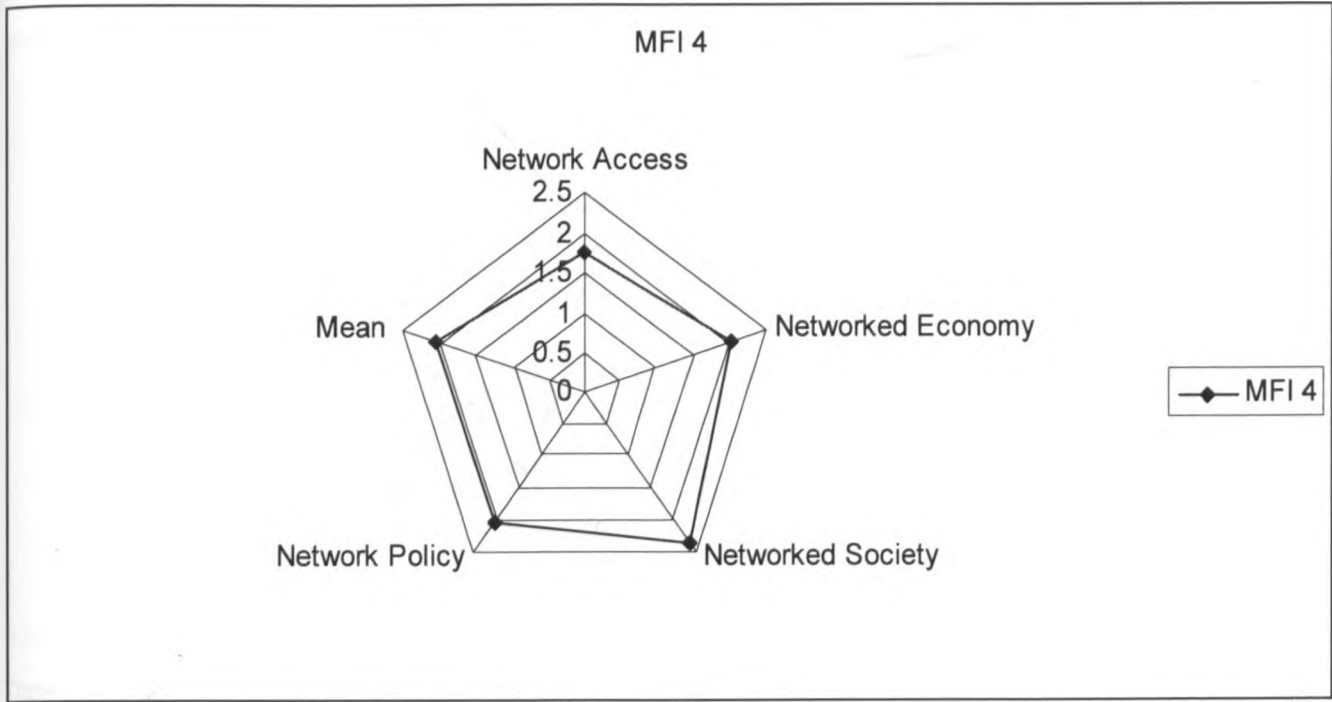
Figure 5.8: E-Readiness for Categories of MFI4

The Fig 5:3 shows that MFI 4 is in the red category of the VERDICT boundaries in all the categories of measuring e-readiness. This indicates that for MFI 4 to be e-ready, then, there is urgent need to improve in all the major categories of network policy, network access, networked society and networked economy. The overall e-readiness of MFI 4 determined from the categories means is 2.42. This falls in the red region indication there are many intervention areas to be addressed to achieve e-readiness. This MFI is registered under the Companies Act.

5.2.4   MFI 5
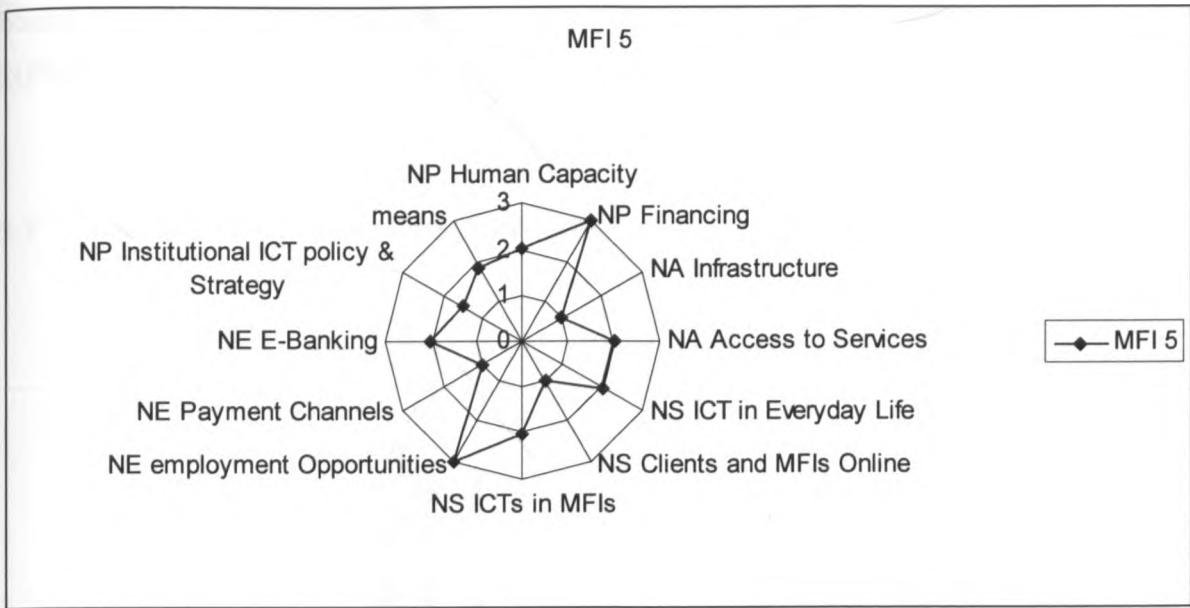
Figure 5.9: E-Readiness for Indicators of MFI5
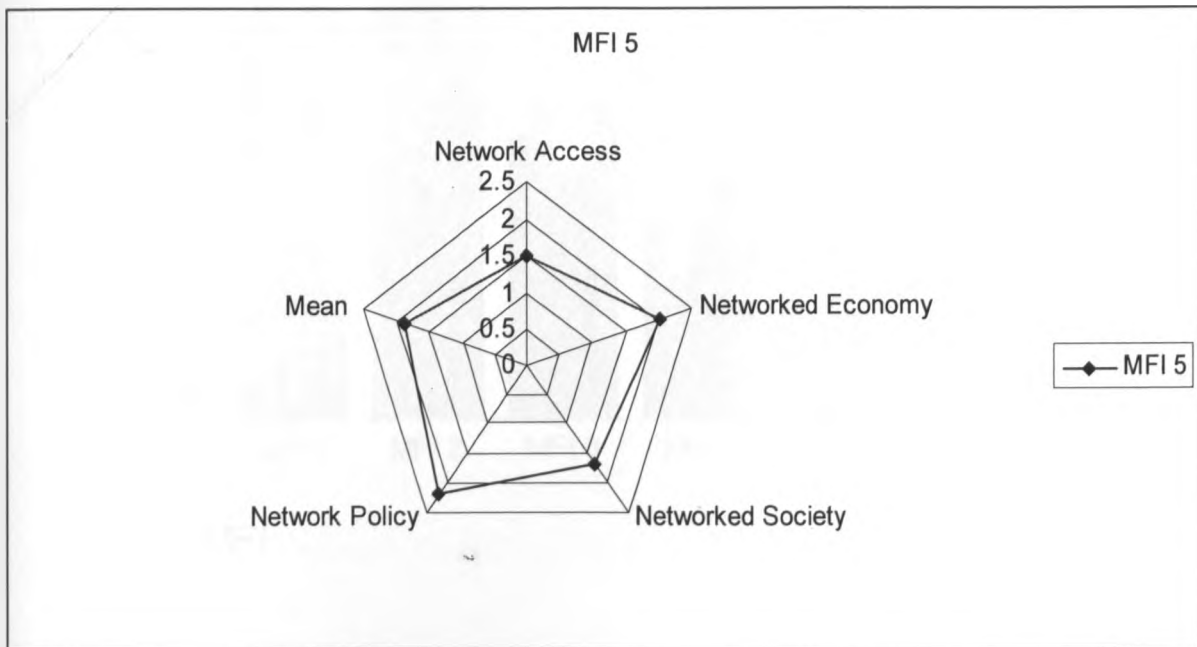
Figure 5.10: E-Readiness for Categories of MFI5

In the Fig 5:4, it shown that MFI5 is wanting in all the categories measuring e-readiness with all the categories registering means of less than 2.5 hence falling in the red region of the VERDICT boundaries. The overall e-readiness means for MFI5 is 2.23, indicating that many aspects in the MFI need urgent attention. This MFI is registered under the Societies Act.

5.3   Benchmarking E-Readiness Internally
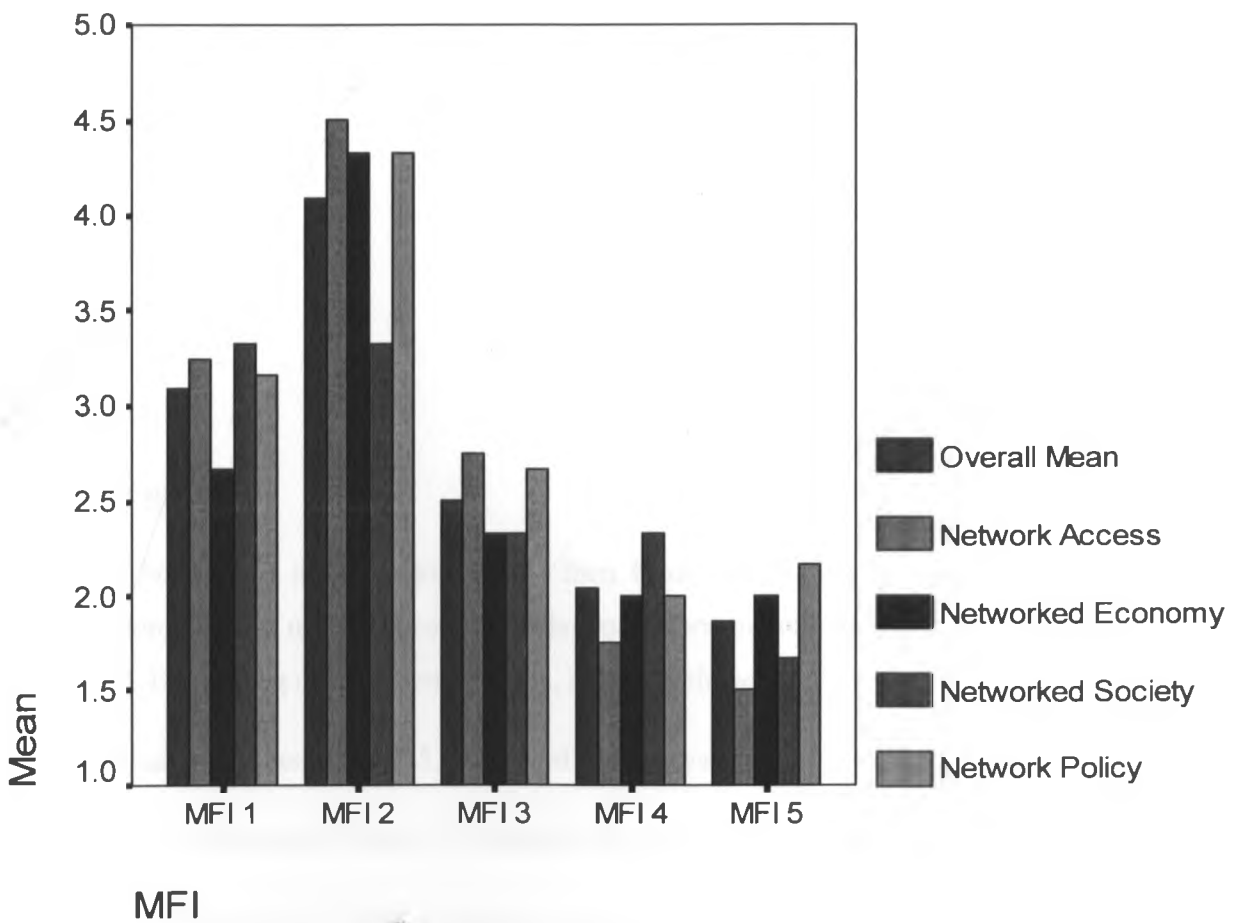
Figure 5.11: Benchmarking E-Readiness among MFIs

The Fig 5:5 above shows the comparisons of the e-readiness levels of the sampled MFIs. It can be concluded that MFIs registered under the Banking are more e-ready while the MFIs registered under the Societies act are least e-ready. There is therefore need to have all MFIs registered

under a common regulatory act to ensure common compliance regulations. Further it can be deduced that Networked Economy for all MFIs appears to be least ready.

5.4   System Design

ROC: Develop an Information System for carrying out E-Readiness assessment for Kenyan MFIs.

5.4.1 INDEX COMPUTATION

Each question has options with unique values as shown below;

Strongly disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly agree	5

Every question belongs to an indicator, which then belong to a category. The responses to questions as entered by the user are grouped under indicators and/or categories and the average value calculated. Depending on the average value, a light is shown i.e.

If the value is between 0 and 2.5, color Red is displayed

If the value is between 2.5 and 3.5, amber is displayed

If the value is between 3.5 and 5, green is displayed

The colors are symbolic of the level of E-readiness i.e.

Red	A lot has to be done to achieve e-readiness
Amber	Some level of e-readiness is available, but more can still be done
Green	The institution is sufficiently e-ready
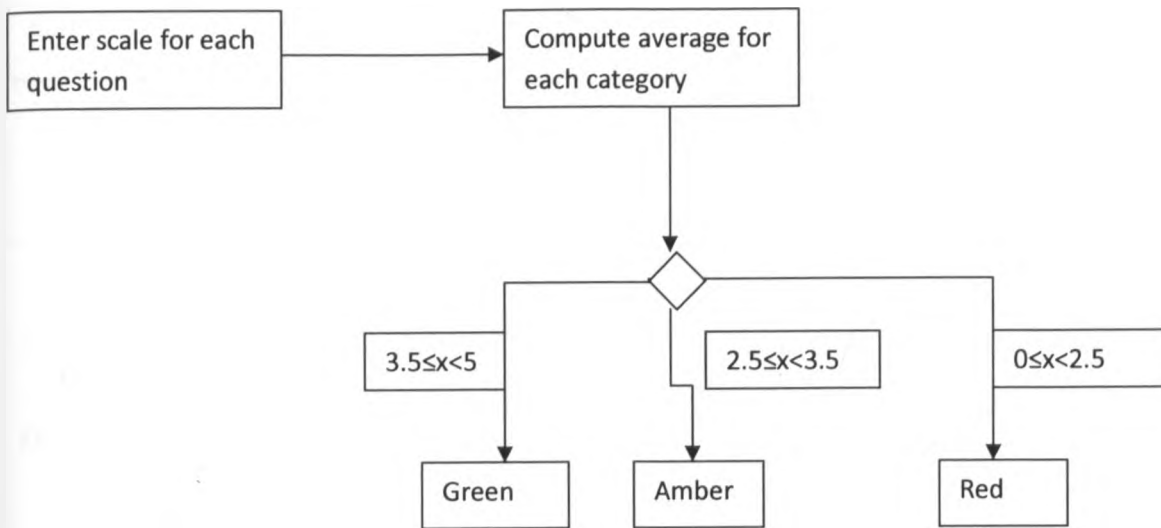
Figure 5.12: Index Computation Module

5.4.2 System Set - Up

This is done by the system administrators. It involves;

Adding categories

Adding indicators

Adding questions

After this, the admin can then form a questionnaire.

N/B:

- Each question belongs to an indicator, while indicators belong to categories.

- For a person to carry out all these duties he/she must first login and this authenticated.
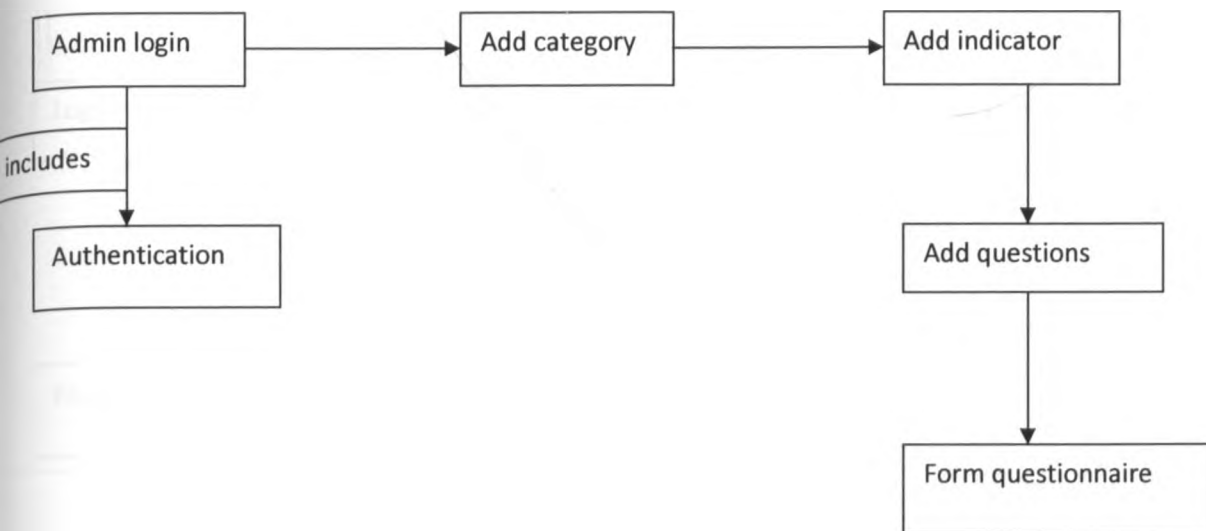
Figure 5.13: System Set-Up Module

5.4.3 Data Collection Module

This is done by the user. It is a three step process

Step 1:

This includes login to the system by providing a username and password. One is supposed to be registered to do this. This is for the purposes of record keeping. Hence, new users are first asked to register the institution, after which they can then proceed to login.

Step 2:

This involves answering the questions. The condition in this step is that all questions must answer. The user then clicks the 'submit' at the end of the questionnaire so as to move to the next step.

Step 3:

This is the report viewing phase. Results can be in the form of 2D bar charts, 3D bar charts, 2D pie charts, curves and 2D doughnut

78
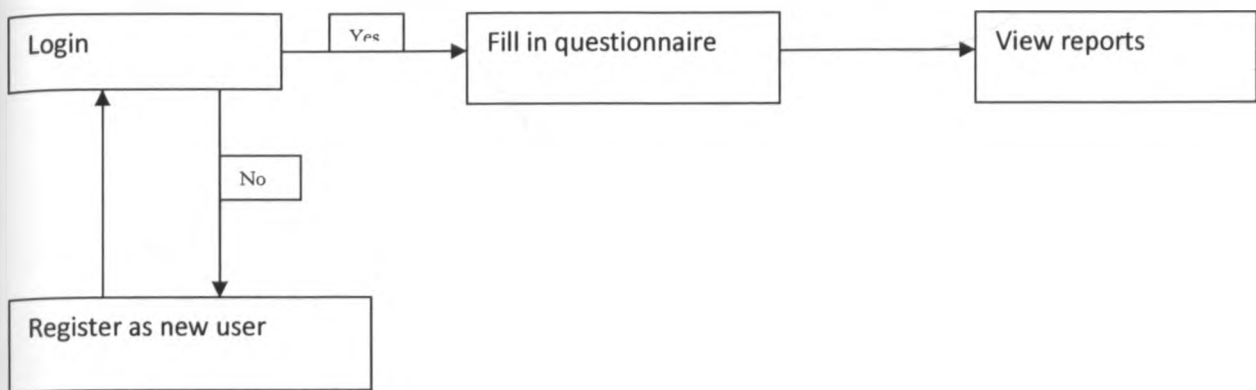
Figure 5.14: Data Collection Module

5.4.4 Database Design

This is the database shema of the e-readiness website. It shows the various tables of the system and the relationships between them.

N/B:

- Each question belongs to an indicator (sub-category) and each indicator belongs to a category. This explains the one-to-many relationship between the tables sub_category and question, and category and sub_category

- Each user must first register the institution, and this information is used to keep track of all responses. This explains the one-to-many relationship between the tables institution and user_responses
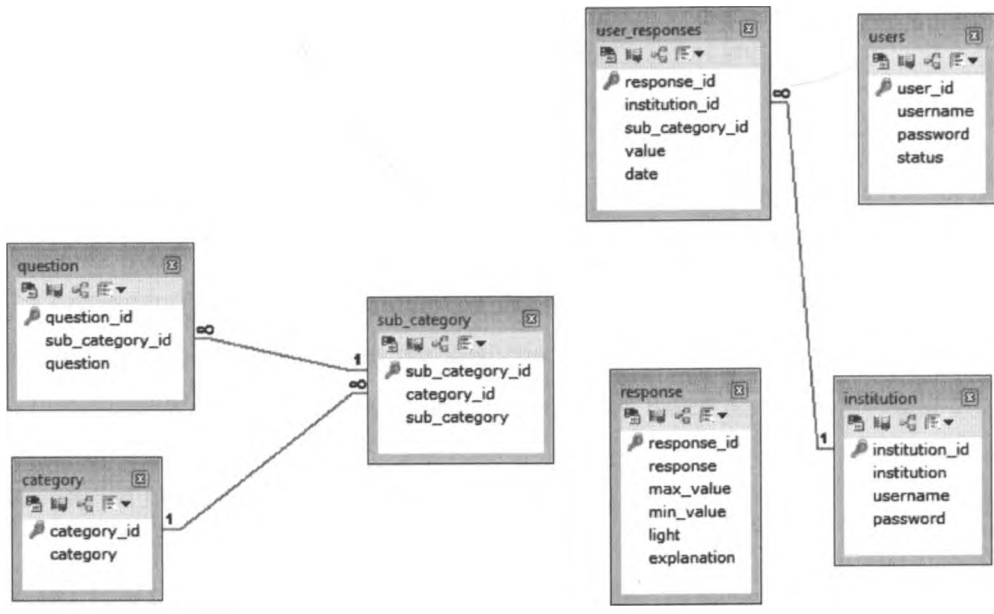
Figure 5.15: Database Design

CHAPTER SIX

FINDINGS AND CONCLUSION

6.1   Findings and Conclusion

In this chapter, findings and conclusion drawn from the research performed in this study will be presented. Consequently, based on findings, we will answer the research objectives stated in chapter one and draw conclusion from the analysis in chapter four. We will also discuss about the answers of research objectives as well as the conclusion based on the theory and the results.

6.2   Research Objectives

MAIN OBJECITVE: Based on existing e-readiness tools/framework, develop a framework for assessing e-readiness of MFIs in Kenya?

This research objective was to develop an appropriate framework for assessing e-readiness

The conclusion to this research objective is that the IFA tool, the combination of three different

framework's aspects, is the most proper frame work to assess the e-readiness level in MFIs in

Kenya.

Below is the is the framework that we developed for e-readiness assessment for MFIs in Kenya.
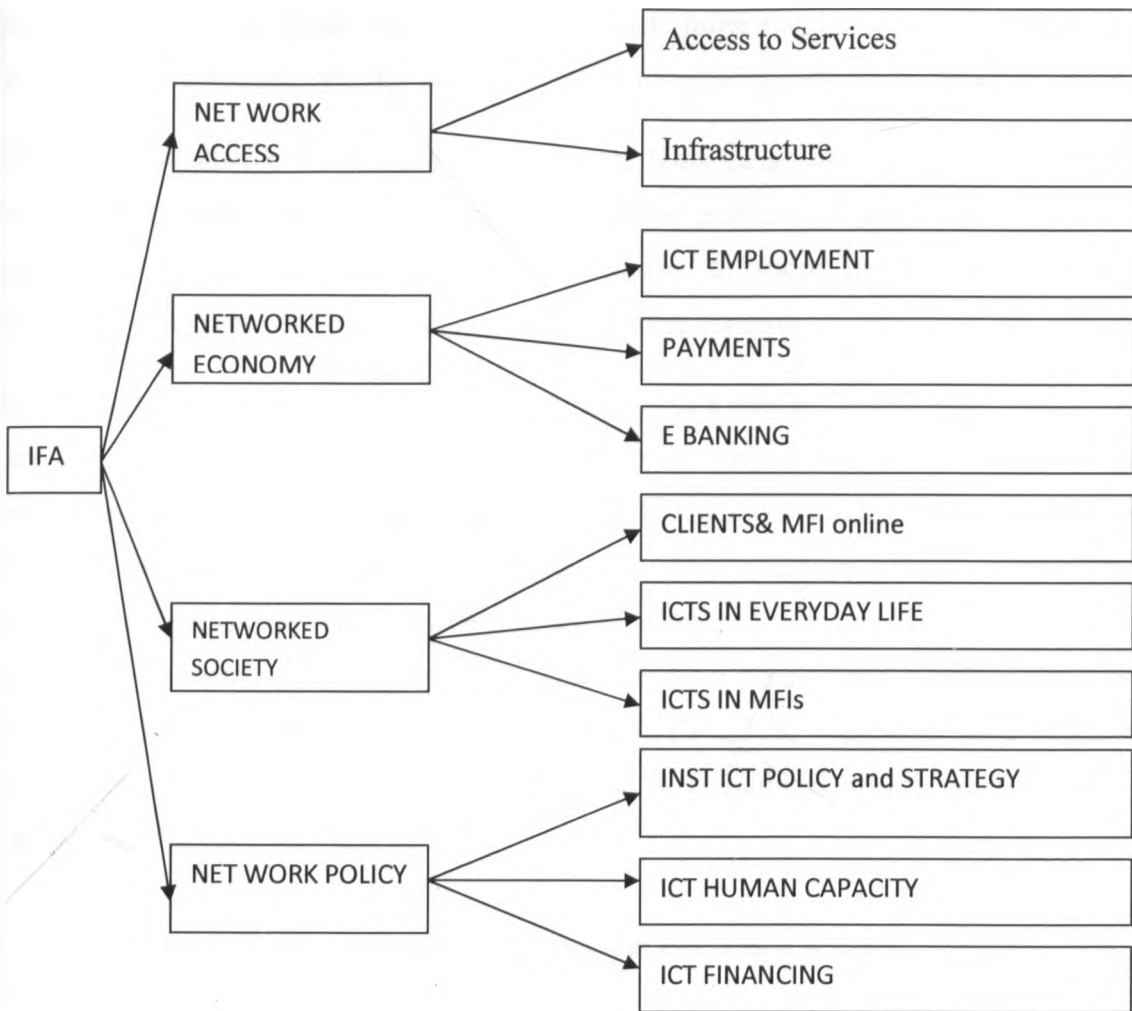
Figure 6.1: The IFA tool

The reason why we chose IFA as the framework

As mentioned in previous chapters, over the last few years an increasing number of e-readiness assessment tools with different underlying goal and definition of e-readiness have been developed. From one point of view in general each tool gauges how ready a society or economy is to benefit from information technology and e-commerce. Therefore following this approach e-readiness assessment tools and models can be divided into two main categories that are not

mutually exclusive i.e. those ones that focus on basic infrastructure or a nation's readiness for business or economic growth, and those that focus on overall society to benefit from ICTs.

However, from other point of view whereas some tools gauge the readiness of countries and economies to adopt internet-technologies in a global platform, others are more focused on assessing the readiness of specific industry sectors to adopt Internet technologies. E.g. VERDICT, which assess the readiness to adopt different concepts or approaches for engineering.

The IFA is built on three mentioned assessment adopts a similar methodology where the end-users are presented with a set of statements and an assessment and an assessment of their e-readiness is based on their responses. According to IFA approach an organization should possess some qualifications to get e-ready. These qualifications could be proved by satisfying the boundaries of four categories as Key Performance Indicators.

As explained in details in chapter 4, eight indicators have positive and significant influence in their respective category e-readiness in Kenya MFI's .Three indicators have negative but insignificant influence on their respective category e-readiness. These are e-banking, ICT financing and MFIs clients' online.

ROA: Identify key indicators that can be used measure e-readiness of MFIs to embrace electronic business.

As explained in chapter four, using the correlation analysis on the categories, four factors namely network policy, networked economy, networked society and network access have statistically significant relationship hence indicating acceptable homogeneity of the scale. Also eleven indicators were identified using factor analysis and the calculation of their reliability proved this classification acceptable and reliable.

Network Access: These are conditions related to enable physical connectivity i.e. basic infrastructure. This category have two indicators namely Access to Services, Infrastructure.

Network Policy: These relates to ICT environment such as policy, business and economic. There is need for competitive and conducive policy environment/ climate. Indicators for this category include ICT policy and strategy, human capacity, ICT financing.

Networked Economy: Organizations and businesses those are able to effectively employ ICT to enhance their service delivery in an efficient and effective manner, while developing more sophisticated and efficient ways of managing their external relationships and communications. Indicators of this category are ICT employment opportunities, payments and e-banking.

Networked Society: The networked society category measures the readiness of the MFIs and MFIs clients to adopt and use ICT for their day-to-day business activities and operations. Indicators include clients and organization online, ICT in everyday life, ICTs in the MFIs (workplace).

ROD: Assess the needs of MFI clients using a sample of the clients in Kenya.

The MFIs clients needs mainly include the following items indicated in the table and fig below.

Table 6.1: Clients needs by percentage of respondents

ITEM	Number	%
Mobile Banking	35	26
Affordable Credit Without Guarantors	22	16
Mobile transfer services M-pesa	28	20
Secure Deposits	10	7
Reduction of time spend on group meetings	30	22
E mail communication	12	9
	137	100
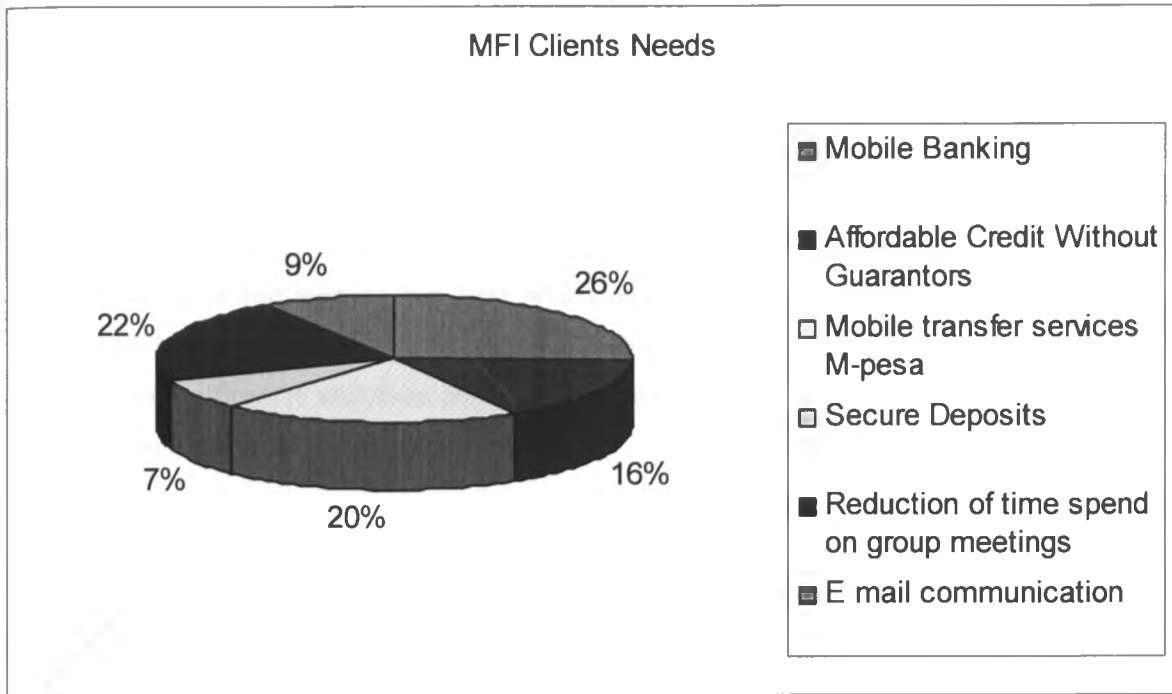
Figure 6.2: MFI client needs

Six key needs of the MFIs clients were identified as

- Mobile banking: Clients would prefer to use mobile phones to carry on their financial services and access their bank accounts for all transactions and payments including making deposits to their accounts and repayment of loans through the mobile phone.

- Access to credit Facilities: Most clients require affordable credit without the need for co-guarantors (prefer individual lending to group lending) where their cash collateral or any other security to a loan is accepted instead of having guarantors to sign the application.

- Mobile payment services e.g. M-PESA: Most clients felt that they need to have money transfer through the mobile phone between the client and MFIs.

- Secure deposits: The clients want a secure mode/ method of depositing/ accessing their money on a 24/7 basis since the current methods involves recording traveling to the MFI or group meetings that involve book recording during meetings and sometimes the entry are inaccurate which causes inconvenience and in some cases overpayment. They would appreciate if the loan officer used a computer to enter the information which should be connected to the MFI's database to make it more efficient and accurate.

- Reductions of time spend on group meetings: In order to get fast and convenient services clients would want time spend on grouping meeting reduced or eliminated altogether. Most MFIs have an average of two meeting per week which removes them from their business or household activities for quite substantial time. This is involving given that members have to wait for the MFIs loan officers to visit them before ending the meeting. One client confirmed that some days they could spend five hours in the meeting.

- Email communication: Clients have to visit the nearest branch to get information which is time consuming. They would prefer to use an e-mail facility which would be fast, efficient and time saving, while it does not remove clients from their activities for long.

From the above Pie chart, it shows that 26% of MFI's clients would want their financial institution to provide m-banking services. This means the clients prefer to use mobile phones for repayments and deposits services and in other transaction with institution.

6.3   Empirical Findings

6.3.1 Using the Verdict Approach

The results of investigation of a cross-section of MFIs in Kenya show the statements about the overall level of e-readiness in the industry.

- The industry has a medium level of e-readiness in three categories of network access, network policy and networked society, a low level e-readiness in network Economy. It means that having an average score range from 2.5 to 3.5 in three categories and average score range from0 to 2.5in

one category, the industry has an "Amber" position due to VERDICT'S boundaries. So more attention is needed for company to be completely e-ready.

- Among those investigated categories, the industry has better position of e-readiness in "networked society' since the average scores of this category is higher than other categories

- In MFI,s" networked Economy" is the least e-ready category with the lowest score compared to all categories. Since i.e. low level e-readiness it means several aspects of this attribute needs urgent attention for the industry to achieve a proper position of e-readiness.

- The difference between most e-ready category and the least e-ready one is more than 1ie 1.02.it indicates that there is medium gap among the e-readiness level of attributes, so the MFIs cannot achieve simultaneously e-readiness in all categories.

6.4   Theoretical Findings

6.4.1 Clarifying the Indicators of Each Category

Using some common characteristics of questions in each category, we applied factor analysis to classify each category into some indicators. Also the accepted values of cronbach's Alpha for each indicator prove the reliability of the findings.

The final explanations about all indicators of each category are given in detail.

Findings of this research indicate that the Network Access category consists of two indicators namely Access to Services (0.76) and Infrastructure (0.90).Each indicator relates to a set of questions among which there are some common characteristics to measure one aspects of network access attribute

Using the same procedure" Networked Economy" attribute was divided into of three indicators to measure ICT Employment (with α = .79), Payments (with α = .81) and E-banking (with α =.63).

87

The "Networked society" attribute, three indicators were extracted which include Clients and MFIs Online (with α = .55), ICTs in Everyday Life(with α =.63) and ICTs in the MFIs Institution(with α = .72).

Finally Network policy" consisted of three indicators namely Institutional ICT Policy and Strategy (with α =.97, ICT Human Capacity (with α =.79) and ICT Financing (with α = .63).

### 6.4.2 Development of Framework to Demonstrate Indicators Importance and also Categories Relationships.

As the ultimate goal of this research, we investigated different combinations of indicators of each category to make a proper structural model in order to demonstrate importance and relationships among the indicators and categories of IFA framework respectively. To achieve accurate results it was done using regression analysis and correlation matrix procedures.

The specific variables selected for populating the framework emerged from basic and initial probes of association and correlation yielding 'groups' of like-factors
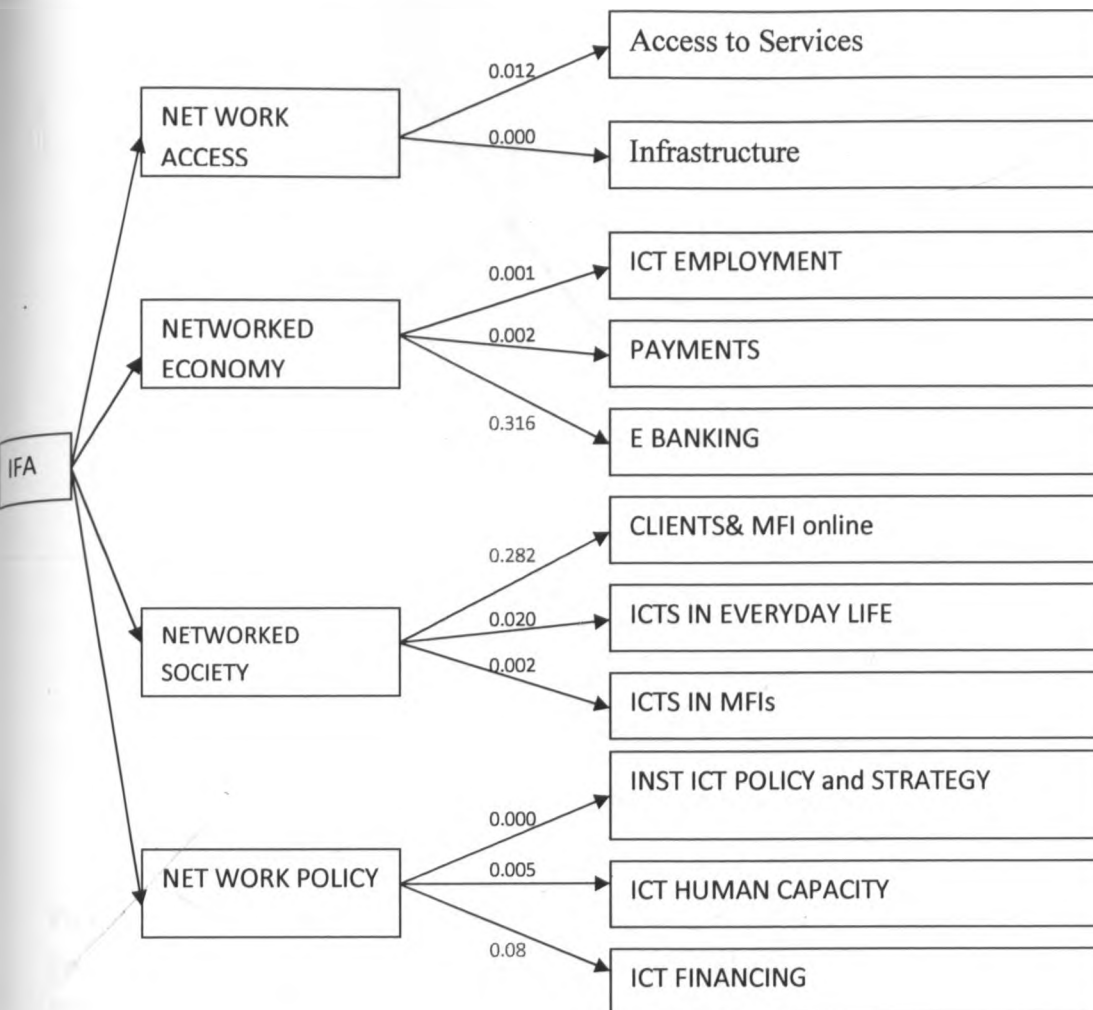
Figure 6.3: The Framework of importance of IFA indicators and Categories

The relationships among attributes (Categories) of IFA tool are indicated through a network diagram. It's done through Correlation analysis of the four categories.
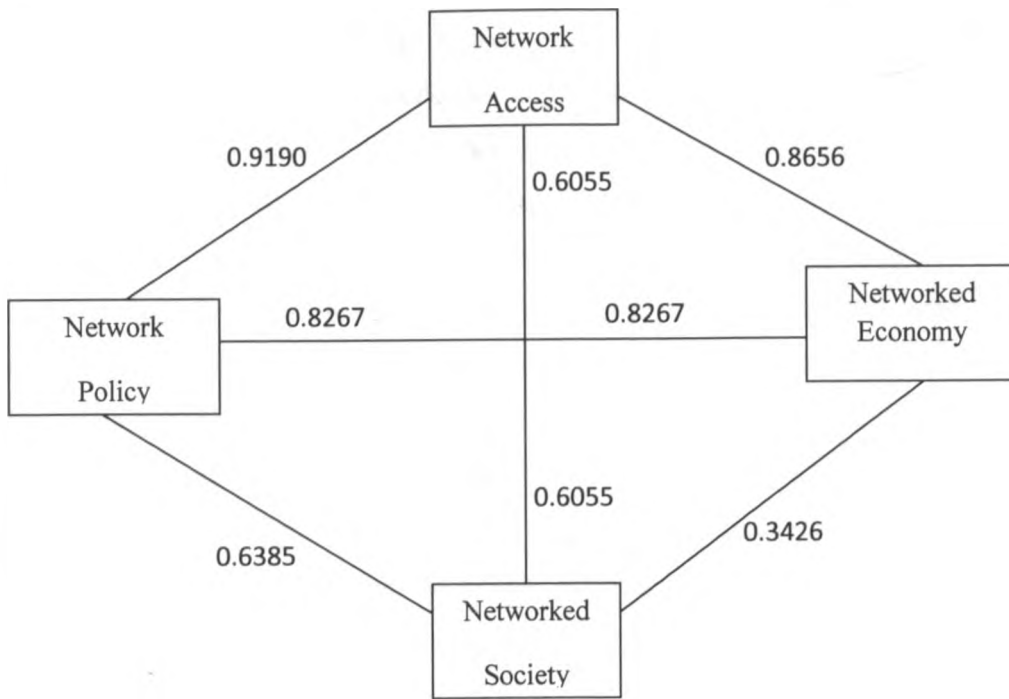
Figure 6.4: Network diagram of relationship among categories of IFA

Finally the relationship among categories were clarified and reflected in above network diagram, which is achieved from correlation matrix.

The relationship among the relationship are summarized below

Table 6.2: Correlation Matrix

	NETWORKEDSOC	NETWORKACCS	NETWORKEDECON	NETWORKPOLIC
NETWORKSOC	1.0000			
NETWORKACCES	.6055	1.0000		
NETWOREDECON	.3726	.8656	1.0000	
NETWORKPOLIC	.6385	.9190	.8267	1.0000

6.5   Implication for MFIs Management

The following are some of the critical issues of the findings of the study that raises concerns as to the e-readiness of MFIs to adopt and use modern and innovative ICT and ICT enabled services.

Network Access

The study found that most MFIs in Kenya do not purchase adequate internet bandwidth, since majority MFIs purchased less than 384 kbps. This may partly be due to the high cost of bandwidth in Kenya or lack of commitment and strategy on IT by most MFIs. This may also be a demonstration of the low status accorded to the internet connectivity in terms of institutional resource allocation and readiness. The other key finding of the study indicated that there is poor and of low quality within the selected MFIs. Most of the MFI staff indicated that the websites regularly are inaccessible, un-updated and the dial-up connection fails due to interruption or busy notices. The MFIs need to hire and retain highly skilled IT technical staff. The other critical finding of the study is that most MFIs and their clients have low access to networked PCs and other IT systems. Leaders of MFIs need to network their business including branches with the headquarters as well as processes to enable them serve clients effectively and efficiently by reducing costs and time wasted for example by branch managers visiting the headquarters for clients loan and payments processing.

Networked society

On the network society, the study found that MFIs lack interactive institutional websites, which renders their websites purely informational. There is need to set up interactive websites on core business systems (clients and finance) as well as for communication and educational. The study also found that most clients and MFIs staff are not regular user of the internet.

Network policy

The study found that there are inadequate and infrequent ICT staff skills and capabilities in MFIs and lack of IT skills likely due to funding constraints. Given the high rate of change of ICT, there is need for MFIs to invest in frequent IT professional training. The study also found that most MFIs have not aligned their ICT strategy to the corporate strategy, hence not part of their E-banking model.

Networked Economy

The study found that most MFIs have not fully adopted and used ICT and ICT enabled services in their banking and payment channels using IT devices such as core banking systems, ATMs,

POS and telephony. The study also found that more than 70% of their clients have a mobile, which can be used for transactions and payments to reduce costs.

These issues need to be addressed in order to assist MFIs and their clients to eliminate the available weakness and constraints concerning their e-readiness to adopt and use modern and innovative ICT and ICT enabled services.

6.5.1 Implication for Theory

Past researches and frameworks have provided us with theory from which we formed the purpose and research questions. This research framework is adaptation of CID tool and two other frameworks. The indicators of the IFA frame work were tested though eight were proven to have a significant and positive effect to the respective categories whiles three the eleven IFA indicators were tested.

6.5.2 Implication for Further Studies

In accomplishing this research we found some interesting areas for further study. Since it is understood that e-readiness is just a new concept in MFIs industry and it will be fascinating to investigate, further researches to study on the barriers and benefits that MFIs may face at first stage of getting ready to apply new technology (ICTs) and also the requirements that an MFI need to meet in this regard.

Besides, after investigating the e-readiness level from the IMFs institution point of view, it would be interesting to explore how ready the MFIs clients to use technologies in facilitation of interactions between an MFI and the client.

6.5.3 Limitations of the Study

- Finding a proper tool to assess e-readiness level within an industry like MFIs. infact in the literature, most available framework were suitable to assess e-economies or e-societies, none of them had the ability to focus more on specific industry or sector within a society or economy.
- Troubles in finding the necessary data. The reason was MFIs are financial institution which due to nature of their business they are secretive .It was hard to convince the MFIs CEO's about the necessity and benefits of doing such an assessment in their company. Also in data gathering phase, it was hard and time consuming job to get the required data from CEOs and Top managers of MFIs since some were busy.

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APPENDICES

APPENDIX A:

THE QUESTIONNAIRE INSTRUMENT FOR MICROFINANCE INSTITUTIONS

SERIAL No....

DD   MM   YY

Date of interview

Instructions

i.   Do not indicate the name of your organization anywhere on the questionnaire.

ii.   It is important that all the questions have a response.

iii.   Give your opinion based on a five-point scale provided under each question.

iv.   Give your response by checking within the box that corresponds to the answer you have chosen.

Where: SD = 'Strongly Disagree', D= 'Disagree', N = 'Neutral', A = 'Agree' and SA= 'Strongly Agree'.

PART   A

1. How long has your institution been operating in Kenya?

    <5yrs   6yrs-10yrs   11yrs-15yrs   16-20yrs   >21yrs

    ☐   ☐   ☐   ☐   ☐

2. What is your target clientele?

    ☐   Low Income House Holds and micro business

    ☐   Middle Income Households and micro business

    ☐   High Income Households and micro business

3. What is the main service you offer? (tick all applicable)

    ☐ Lending

    ☐ Savings/Deposits Channels

    ☐ Money Transfer Services

    ☐ Insurance

4. What is the distribution of your branches?

Location	Number of Branches
Nairobi Province	
Other Provinces	

5. How many clients does your institution have?

<3000	3001-10,000	10,001-30,000	30,001-50,000	>50, 0001
☐	☐	☐	☐	☐

6 _Under what Act of Parliament is, your institution registered or licensed? (tick)

☐ Microfinance Act   ☐ Banking Act   ☐ Non-Governmental Co-ordination Act

☐ Companies Act   ☐ Societies Act

PART   B

NETWORK POLICY

1.   Our staff has the necessary levels of IT literacy, functional expertise and skills to use e-banking tools.

SD	D	N	A	SA
☐	☐	☐	☐	☐

2.   Our current institutional structure provides an environment that is well suited for e-business and e-banking adoption and use.

SD	D	N	A	SA
☐	☐	☐	☐	☐

3.   We have a well defined strategy for adopting e-banking tools

SD	D	N	A	SA
☐	☐	☐	☐	☐

4. We have developed strategies to migrate users of existing services to internet based applications

SD	D	N	A	SA
☐	☐	☐	☐	☐

5. We have defined strategy to align e-banking tools with our existing business processes.

SD	D	N	A	SA
☐	☐	☐	☐	☐

6. We have a long-term strategy to ensure continuous project and process improvement using e-banking tools.

SD	D	N	A	SA
☐	☐	☐	☐	☐

7. Our e-banking strategy is communicated at all levels within the organization.

SD	D	N	A	SA
☐	☐	☐	☐	☐

8. All levels of management in our organization have an e-banking mind approach.

SD	D	N	A	SA
☐	☐	☐	☐	☐

9. Our IT staff has adequate knowledge of our technical implementation of ICT and e-business strategy to provide technical support.

SD	D	N	A	SA
☐	☐	☐	☐	☐

10. What is the major source of funding ICT budget of your organization?

Loans	shareholders	grants	internal sources	donors
☐	☐	☐	☐	☐

11. The Microfinance Act is supportive of ICT adoption and use by microfinance institution.

SD	D	N	A	SA

☐ ☐ ☐ ☐ ☐

13.   Our current use of e-banking tools compares favorably to that of our competitors.

SD   D   N   A   SA

☐ ☐ ☐ ☐ ☐

14.   Our approach to e-banking adoption is flexible enough to accommodate new and emerging technologies.

SD   D   N   A   SA

☐ ☐ ☐ ☐ ☐

15.   We are committed to allocating adequate resources in terms of time, staff and budget, required to implement and use e-banking tools.

SD   D   N   A   SA

☐ ☐ ☐ ☐ ☐

NETWORK ACCESS

16.   How many dial-up attempts\connections fail because they are busy or interrupted?

>6%	5-6%	3-4%	1-2%	<1%
☐	☐	☐	☐	☐

17. How often are organizations websites or addresses inaccessible

Many	Regularly	None	Sometimes	Rarely
☐	☐	☐	☐	☐

18. What is the teledensity (number of telephone lines per 100 people) in your organization.

0-5%	5-10%	11-20%	21-40%	>40%
☐	☐	☐	☐	☐

19. What is the highest connection speed supported by organization infrastructure available to your clients/staff.

56kbps	57-384kbps	385kbps-1.5Mbps	1.6-45Mbps	>45Mbps
☐	☐	☐	☐	☐

20. What is the capacity of access services available to your organization?

</=56 Kbps   </=56kbps   57-128kbps   129kbps-1Mbps   >1 Mbps

Not widely available   widely available

☐   ☐   ☐   ☐   ☐

21. Your organization have a strong fire wall.

SD	D	N	A	SA
☐	☐	☐	☐	☐

22. What percentage of the branches of your organization has access to digital wireless or other system such as Direct PC?

75-100%	51-75%	26-50%	1-25%	o%
☐	☐	☐	☐	☐

23. What percentage of your staff and clients has access to internet via cabled or wireless network

0 %	1-5%	6-20%	21-50%	51-100%
☐	☐	☐	☐	☐

NETWORKED SOCIETY-READINESS

24. Clients use email for exchanging information and documents with our institution.

SA	A	N	D	SD
☐	☐	☐	☐	☐

25. What proportion of your clients uses cybercafé to communicate to your organization?

<5%	5-10%	11-20%	21-30%	>30%
☐	☐	☐	☐	☐

26. Our staff use email for exchanging information and documents both internally and externally, amongst themselves and with clients and stakeholders.

SD	D	N	A	SA
☐	☐	☐	☐	☐

27. What percentage of the organization clients has a PC at home?

<5%	5-10%	11-20%	21-30%	>30%
☐	☐	☐	☐	☐

28. What percentage of your organization clients use internet to access your services?

76-100%	51-75%	26-50%	1-25%	0%
☐	☐	☐	☐	☐

29. Our current organization structure provides an environment that's well suited for internet use to serve clients.

SD	D	N	A	SA

☐   ☐   ☐   ☐   ☐

30.   Our organization use internet to overcome current process in-efficiencies.

    SD   D   N   A   SA

    ☐   ☐   ☐   ☐   ☐

31.   What percentage of the organizational clients has mobile/cell phone?

    76-100%   51-75%   26-50%   1-25%   0%

    ☐   ☐   ☐   ☐   ☐

NETWORKED ECONOMY

32.   Our organization has employed knowledge workers

    SD   D   N   A   SA

    ☐   ☐   ☐   ☐   ☐

33.   We have a system to respond to clients who contact us by email.

    SD   D   N   A   SA

    ☐   ☐   ☐   ☐   ☐

34.   We are already experienced at developing successful strategic alliances with competitors, ICT providers and commercial banks.

SD	D	N	A	SA
☐	☐	☐	☐	☐

35. We use the Mobile services as a mode of payments with our clients   SD

D   N   A   SA

| ☐ | ☐ | ☐ | ☐ | ☐ |

36. Our current organizational structure provides an environment that is well suited for IT professional.

SD	D	N	A	SA
☐	☐	☐	☐	☐

37. We use our main banks extranets to determine the status of our accounts.

SD	D	N	A	SA
☐	☐	☐	☐	☐

38. We have determined the extent to which ATMs are important to our Clients.

SD	D	N	A	SA
☐	☐	☐	☐	☐

Thank you for taking your time to fill this questionnaire

APPENDIX B:

THE QUESTIONNAIRE INSTRUMENT FOR MICROFINANCE CLIENTS

SERIAL No.

DD   MM   YY

Date of interview

Instructions

i).   Do not indicate your name anywhere on the questionnaire.

ii). It is important that all the questions have a response.

1.   Which of the following represents your income bracket?
     □Below KSh.5, 000 per month   □KSh.5, 000-15,000   □KSh.15, 001-30,000
     □KSh.30, 001-50,000   □Above KSh.50, 000

2.   Which level of education have you attained?
     □Never been to school   □Primary school   □Secondary school   □College
     □University

3.   Do you visit a cyber café to use computers or access internet facilities?
     □ No   □ Yes

4.   How often do you use computers?
     □Never   □Daily   □Once a week   □Once a month

107

5. Do you have a mobile phone?

    □ No   □ Yes

6. In what ways would you like your financial institution to improve delivery of services
    using ICT, so as to serve you better?

    ....

    ....

APPENDIX C:

LIST OF INTERVIEWED INSTITUTIONS

1. BIOMAS
2. BLUE LIMITED
3. EQUITY BANK
4. COOPERATIVE BANK OF KENYA
5. FAULU KENYA
6. JAMII BORA
7. KADET-WORLD VISION
8. KENYA POST BANK
9. KENYA WOMEN FINANCE TRUST
10. MICRO KENYA
11. PRIDE KENYA
12. SISDO MICROFINANCE INSTITUTION
13. SMEP
14. SUNLINK LTD/OPPORTUNITY INTERNATIONAL
15. WINDOWDEVELOPMENT

APPENDIX D:

SYSTEM USER MANUAL

MFI E – READINESS ASSESSMENT SYSTEM

INTRODUCTION

The developed MFI E-Readiness assessment system is designed to be used online. It was developed on the apache web server, mysql database using php, java script and html as the programming languages. Any MFI that has access to the internet would then be able to access this assessment system and carry out an assessment of their current state of readiness. For a new MFI user, the first step will be to register. Once registered, an account is created for the MFI such in future, the MFI will login using the username and password initially used.

The system has been designed to be easy to use, navigable, readable and with simple English.

Previous states of readiness are stored in the database in the account of the particular MFI hence an MFI can evaluate itself at regular intervals using the previous assessment as baseline information hence assess whether they have improved within the duration under consideration.

SYSTEM REQUIREMENTS

This system can be hosted by any ISP.

The users of the system require to have Mozilla Firefox browser version 3.5.1 or higher or Windows® Internet Explorer version 7.0 or higher to display the web pages properly.

END USER MANUAL

For effective use of this system, a user manual has been developed, to assist the user to exploit all the features of the system. Once the user visits the website, the home page appears.

HOME PAGE

The home page contains a brief introduction to the use of the site. The home gives the user an option of logging into the site if they are already registered or register themselves with details that they will use in future visits.
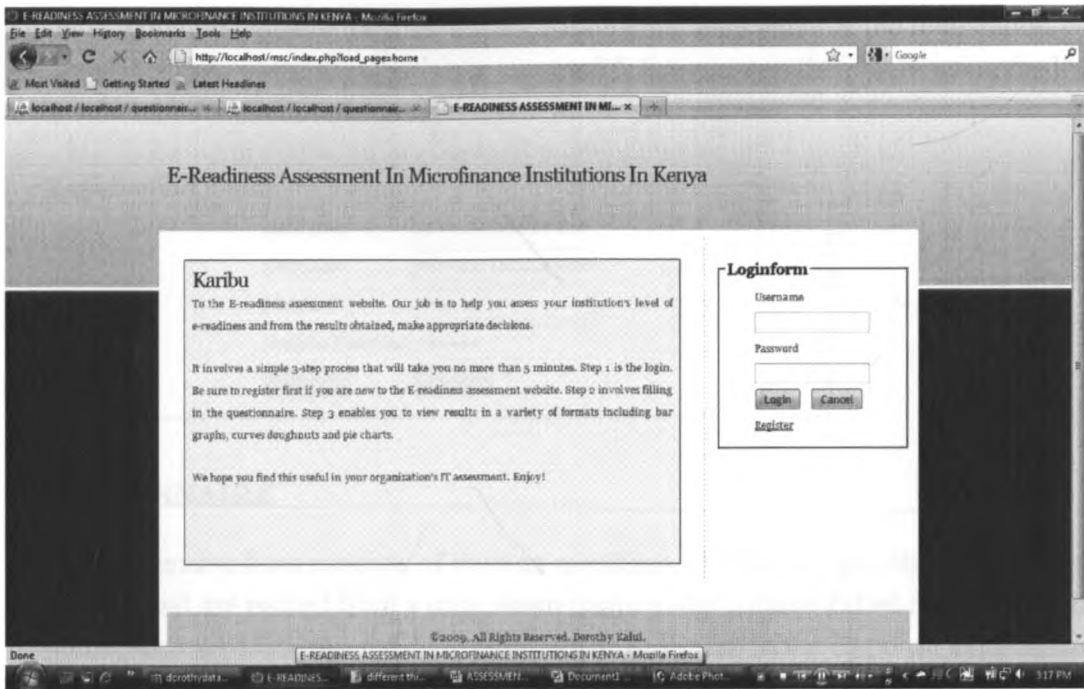
LOGIN FORM

If the user is a regular user, they will be required to supply their user name and password in the login form, then click on the login tab.

REGISTRATION FORM

A new visitor to the site will be required to register first. To do this, they will be required to click on the Register hyperlink in the login form. This will open the following window, to allow a user to supply the name of the institution, username and password and then submit the form.

Upon submission, the user will see a dialog informing then whether the registration was successful or not. If the registration is successful, the user can then login using the login form. This will take the user to the questionnaire form.

```
┌─Registration Form──────────────────────────────────
│
│              Institution        NEWSON MICROFINAN
│
│              Username           NEWSON MICROFINAN
│
│              Password           ••••••
│
│              Confirm Password   ••••••
│                    Submit            Cancel
│
└────────────────────────────────────────────────────
```

QUESTIONNAIRE

The questionnaire form consists of thirteen questions. The answers to these questions are perceptive and are picked from a drop down menu in the column called responses. To select a response, the user clicks on the downward arrow of the tab in the response column corresponding to the question in the questions column. Once all the questions have been responded to, the user then submits the questionnaire by clicking on the submit tab.

```
┌─Questionnaire Form────────────────────────────────────────────────
│
│  │ No │ Questions                                          │ Responses       │
│  ├────┼────────────────────────────────────────────────────┼─────────────────┤
│  │ 1  │ Government policies are in place to promote and     │ Disagree      ▼ │
│  │    │ manage use of ICTs in MFIs.                        │                 │
│  │ 2  │ Our MFI has institutional policies that promote and │ Disagree      ▼ │
│  │    │ manage the use of ICT in our business operations.   │                 │
│  │ 3  │ Our staff has the necessary levels of IT literacy,  │ Select...     ▼ │
│  │    │ functional expertise and skills to use e-banking    │ Select...       │
│  │    │ tools.                                              │ Strongly Disagree│
│  │ 4  │ Our annual budget always has a vote for financing   │ Disagree        │
│  │    │ new ICT projects.                                   │ Neutral         │
│  │ 5  │ Quality of Internet connections to MFI is           │ Agree           │
│  │    │ appropriate for out ICT needs.                      │ Strongly Agree  │
│  │ 6  │ Speed of Internet connection for our MFI is         │ Select...     ▼ │
│  │    │ appropriate for our ICT needs.                      │                 │
│  │ 7  │ There is one computer for every 5 people connected  │ Select...     ▼ │
│  │    │ to the internet in our organization.                │                 │
│  │ 8  │ Our organization clients have PCs at home            │ Select...       │
│                            Submit
│  ───────────────────────────────────────────────────────────────
└────────────────────────────────────────────────────────────────────
```

RESULTS IN CATEGORIES

If the form is successfully submitted, the data supplied is analyzed and results of the state of E-Readiness per category are displayed in a table with three columns. The first column is the category column, the second column displays the staging using three types of blinking lights which indicate the stage of a particular category in e-readiness. The third column has the

112

explanation to explain the meaning of the stage indicated against a category. To view the stage of the indicators under a particular a category, the user should click on the name of the category.

Results

| Category	Stage	Expalanation
Network policy	■	E-Ready
Network Access	■	Attention Reguired to achieve E-Readiness
Networked Society	■	Urgent attention Reguired to achieve E-Readiness
Networked Economy	■	Urgent attention Reguired to achieve E-Readiness

RESULTS INDICATORS

If the user clicks the Networked Society for example, the following figure will show again with blinking colours indicating the individual state of the indicators with an explanation against it.

Results

Networked Society Indicators	Stage	Expalanation
KCT in Everyday Life	■	Attention Reguired to achieve E-Readiness
Clients and MFIs online	■	Urgent attention Reguired to achieve E-Readiness
KCT in MFIs(workplace)	■	Urgent attention Reguired to achieve E-Readiness
Back		

GRAPHICAL REPORTS CATEGORIES

Upon clicking on Graphical Reports, results in coloured bar graphs in the category are displayed.
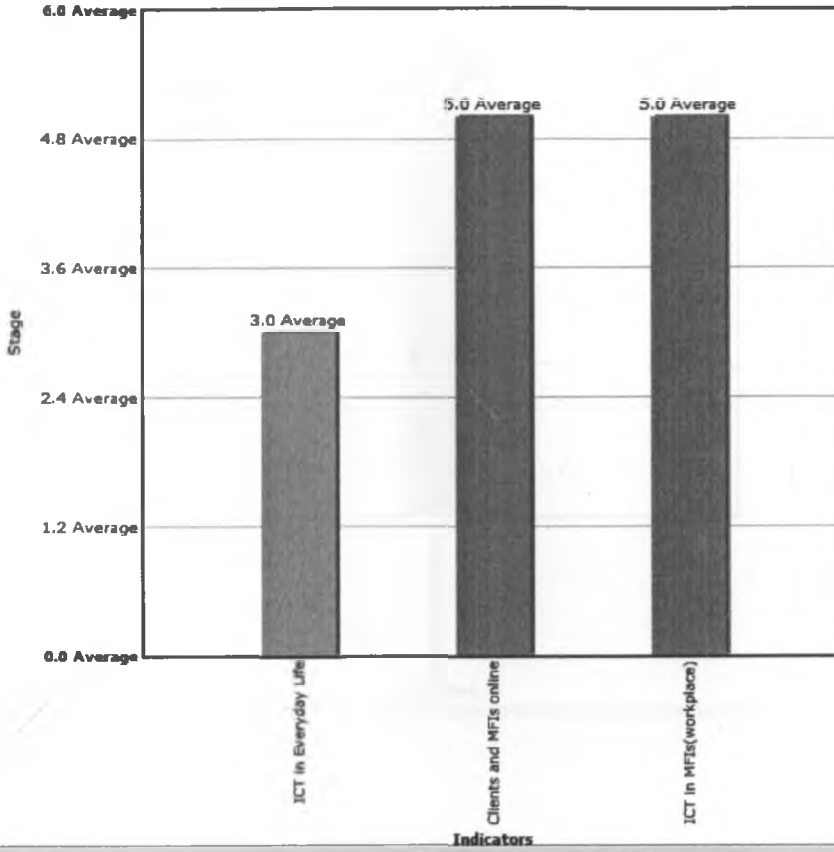
E-Readiness for NEWSON MICROFINANCE
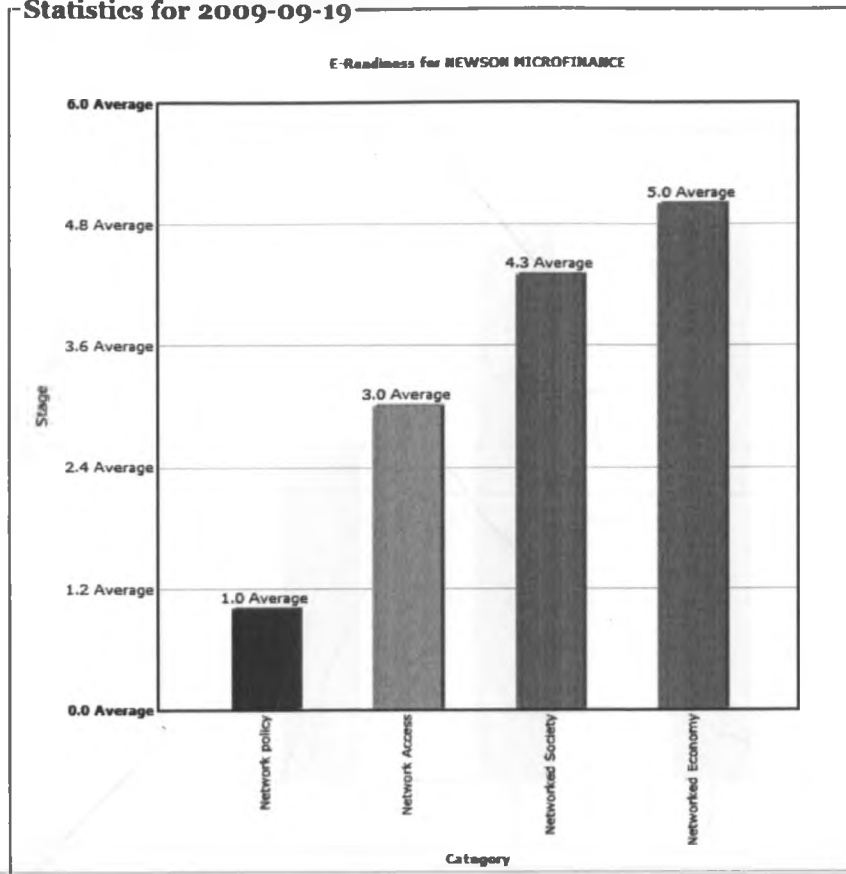
GRAPHICAL REPORTS INDICATORS

Viewing graphical reports for indicators of any particular category can be done by double-clicking on the bar of the category of interest.

Networked Society Indicators
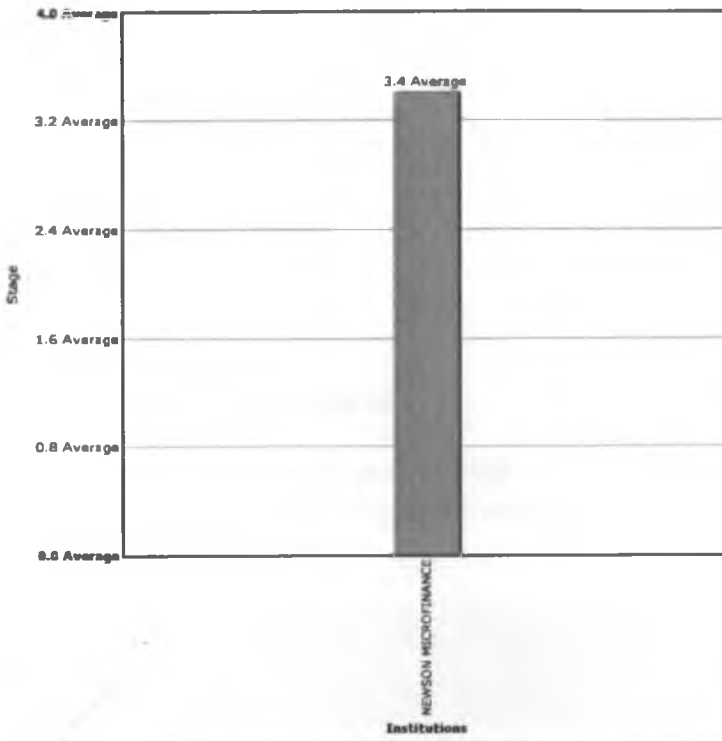

OVERALL E-READINESS

On clicking <u>Overall Readiness</u> , the user is able to view the overall e-readiness of the institution.

E-Readiness for NEWSON MICROFINANCE

ADMINSTRATOR MANUAL

It is also important to provide the administrator manual for the system administrator.

ADMINISTRATOR LOGIN FORM

The administrators login form appears upon uploading the administrators page. The administrator will be required to enter username and password.

CATEGORY EDITING FORM

Upon successful login, the category editing form appears. From this environment, the administrator can add, update or delete a category. Using the tab at the top of the form, one can pick on any other editing forms.

E-Readiness Assessment In Microfinance Institutions In Kenya

| QUESTION CATEGORY | INDICATOR | QUESTION | INSTITUTIONS | VERDICT BOUNDARIES | USERS |

Category Form

Category Name

Submit   Cancel   Update

Category Information

Id	Category Name	Update	
20	Network policy	Edit	Delete
21	Network Access	Edit	Delete
22	Networked Society	Edit	Delete
23	Networked Economy	Edit	Delete

Quick Links

Analysis

Logout

INDICATORS EDITING FORM

Clicking on the indicator tab will allow the administrator to add, update or delete an indicator of a particular category. An indicator can only be added on to an existing category.

Indicators Form

Category   Select...

Indicator

[Submit] [Cancel]   [Update]

Indicators

Id	Category	Indicator	Update	
10	Network policy	Institutional ICT policy and strategy	Edit	Delete
11	Network policy	Human Capacity	Edit	Delete
12	Network policy	ICT Financing	Edit	Delete
13	Network Access	Access to Services	Edit	Delete
14	Network Access	Infrastructure	Edit	Delete
15	Networked Society	ICT in Everyday Life	Edit	Delete
16	Networked Society	Clients and MFIs online	Edit	Delete
17	Networked Society	ICT in MFIs(workplace)	Edit	Delete
18	Networked Economy	Employment Opportunities	Edit	Delete
19	Networked Economy	Payment Channels	Edit	Delete
20	Networked Economy	E-Banking	Edit	Delete

QUESTIONS EDITING FORM

On clicking on the question tab, the form for editing the questions in the question is downloaded. A question can only be added to an existing indicator. Further, the administrator can delete or update an existing question.

Question Form

Indicator	Select... ▼
Question	

Submit   Cancel   Update

Questions

Id	Indicator	Question	Update	
6	Institutional ICT policy and strategy	Government policies are in place to promote and manage use of ICTs in MFIs.	Edit	Delete
7	Institutional ICT policy and strategy	Our MFI has institutional policies that promote and manage the use of ICT in our business operations.	Edit	Delete
8	Human Capacity	Our staff has the necessary levels of IT literacy, functional expertise and skills to use e-banking tools.	Edit	Delete
9	ICT Financing	Our annual budget always has a vote for financing new ICT projects.	Edit	Delete
10	Access to Services	Quality of Internet connections to MFI is appropriate for out ICT needs.	Edit	Delete
11	Access to Services	Speed of Internet connection for our MFI is appropriate for our ICT needs.	Edit	Delete
12	Infrastructure	There is one computer for every 5 people connected to the internet in our organization.	Edit	Delete
13	ICT in Everyday Life	Our organization clients have PCs at home.	Edit	Delete
14	Clients and MFIs online	Our organization regularly uses ICT/Internet with the community and clients	Edit	Delete
15	ICT in MFIs(workplace)	Staff at all levels in our organization has access to Internet services within the organization for communication and exchange of information amongst themselves	Edit	Delete

MFI's EDITING TABLE

On clicking on the institution tab. The listing of all the registered MFIs is displayed.

Institution Information

Id	Institution Name	Username	Password	Update	
10	MFI5	kala	kala	Edit	Delete
16	MFI6	mercy	mercy	Edit	Delete
18	MFI8	Sham	sham	Edit	Delete
19	mfi5	mfi5	mfi5	Edit	Delete
20	mfi1	mfi1	mfi1	Edit	Delete
21	mfi2	mfi2	mfi2	Edit	Delete
22	mfi3	mfi3	mfi3	Edit	Delete
23	mfi4	mfi4	mfi4	Edit	Delete
24	mfi1	mfi1	mfi1	Edit	Delete
25	jack	jack	jack	Edit	Delete
26	NEWSON MICROFINANCE	NEWSON MICROFINANCE	newson	Edit	Delete

BOUNDARY EDITING FORM

When the admin clicks on the verdict form, then a form for adding extra boundaries for analysis appears. The admin can add, or make any other changes as necessary.

Verdict Form

Response	
Minimum Value	
Maximum Value	
Explanation	
Color Image	Browse

Submit   Cancel   Update

Verdict Information

Id	Response	Minimum	Maximum	Explanation	Color Image	Update	
12	Green	3.5	5.0	E-Ready	green.gif	Edit	Delete
13	Amber	2.5	3.5	Attention Required to achieve E-Readiness	amber.gif	Edit	Delete
14	Red	0.0	2.5	Urgent attention Required to achieve E-Readiness	red.gif	Edit	Delete

ADMINISTRATOR NAME AND PASSWORD EDITING FORM

The administrator can also add other administrators to the system with whom to share responsibilities using the user form.

User Form

Username	
Password	
Confirm Password	

Submit   Cancel   Update

Users

Id	Username	Password	Update	
0			Delete	Update
1	admin	admin	Delete	Update