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Abstract

Purpose: There has been increased growth in diffusion of ICT in the operations of Microfinance institutions in Kenya in a bid to improve efficiency, accuracy, increasing outreach and reducing costs. However, empirical evidence shows that internet connectivity remains a challenge. The general objective of this research project was to find out the effects of internet connectivity on performance of microfinance deposit taking institutions.

Methodology: The study adopted a descriptive research design. The target population of the study was 95 staff from 9 deposit taking microfinance institutions in Kenya. The study applied a census approach since the population is small, thus the entire 95 staff from the nine deposit taking MFIs were considered for the study. The respondents were both the management and the general staff in ICT departments in the nine selected Deposit taking Microfinance Institutions. The study collected primary through a semi-structured questionnaire. A pilot study was conducted to test the reliability of the research instrument. Both descriptive statistics and inferential statistics were used to analyze the data. Descriptive statistics included distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies while inferential statistics included a linear regression model which sought to determine the form of relationship between the dependent and the independent variables. The data analysis was aided by SPSS software. The analyzed data was presented using tables, charts and graphs.

Results: The study found out that infrastructure, bandwidth and WAN optimization affected internet connectivity to a great extent and subsequent performance of the MFIs. However, cost of applications affected internet connectivity and performance of MFIs to a moderate extent. The study concludes that there is a positive and significant association between performance of MFIs in Kenya and infrastructure, bandwidth, Wan optimization while the study also found a negative relationship and insignificant between cost of applications and performance of MFIs.

Unique contribution to theory, practice and policy: The study recommends that the management of MFIs in Kenya should improve on the existing IT infrastructure so as to improve internet connectivity in their firms. MFIs should also improve bandwidth to maximize the internet speed since it affects employees' productivity due to data limitations.

Keywords: *infrastructure, bandwidth, WAN, internet connectivity, microfinance*

1.0 INTRODUCTION

1.1 Background and Research Gap

Technology is consistently cited as one of the greatest challenges faced by MFIs around the world; efficient use of technology can help reduce costs, improve efficiency, and increase outreach. (EMN IT & Innovation Working Group, 2011). Brynjolfsson and Hitt (2000) also assert that the use of ICT can help to cut down the costs of coordination, communication, and information processing, and to enable efficient service provision at lower cost. ICT is a strategic tool that enables users to be efficient and effective. ICT promotes the dual objective of microfinance, which is the sustainability and outreach to the poor people. Although ICT can help MFIs to reduce transactional costs, expand their market, and provide affordable and flexible services to customers, many of them continue to rely on inefficient manual data processing systems (Parikh, 2006) which create inefficiency.

Technology makes it possible for MFIs to collect more information with high accuracy. It enables institutions to process and store that information more quickly, more neatly and more reliably than with manual systems. It also facilitates the ease and speed of information flow, significantly improving communication both within the institution and externally. More people can have better, faster access to more relevant information (Frankiewicz, 2003).

The utilization of the National Fiber Optic Cable to facilitate access to ICT services is below the expected level both in rural and urban areas. The low rate of development in rural Kenya has multiple and mutually reinforcing causes which are exacerbated further by the lack of access to ICT. The people living in rural areas lack access to information about income earning opportunities, market prices for the goods they produce, health, their rights and public welfare. They lack access to knowledge, education and skills to improve their livelihood, and a voice in the political and development processes that can shape their lives (Communication Authority Report, 2010).

Globally, microfinance emerged in the 1970s as a component of development programs which were being championed by donor funded non-governmental organizations (NGOs). Modern microfinance was started by Professor Muhammad Yunus in Bangladesh through his experimental research project of providing credit to the rural poor in 1970s. The experimental project which was highly driven by developmental optimism later developed into the world's most famous MFI; the Grameen bank whose model has been replicated worldwide including in Kenya. Although microfinance, demonstrated capacity to commercially provide large scale outreach to the poor in 1980s, it was not until 1990s that it developed into an industry (Robinson, 2001).

In this global age, new technologies are redefining financial services delivery in many ways, and they have the power to present significant opportunities to deposit taking microfinance institutions. A significant number of MFIs are still reluctant to apply new technologies and prefer to stick to tried-and-tested pre-technology ways (Campion & Halpern, 2013).

According to Hishingsuren (2006), internet provides several benefits to clients and MFIs in various countries. The benefits to clients include but not limited to, access to banking services, more convenient services, faster loan processing, less time in queues, reduced transaction costs, less fraud, improved quality of financial information, increased outreach, reduction in

operational costs, and increase in customer satisfaction and loyalty. The Association of Microfinance Institutions (AMFI) is a member-based institution, registered in 1999 under the Societies Act by the leading MFIs in Kenya, with the aim to build the capacity of the Kenyan microfinance industry. The main reasons for its establishment were the felt need for MFIs to have a common voice; to lobby government for favorable policies; to share information, experiences and to link up and network with both local and international actors.

AMFI currently has 59 member institutions serving more than 6,500,000 poor and middle class families with financial services throughout the country. Membership ranges from large, mature MFIs to relatively smaller and rural MFIs, wholesalers and retailers as well as micro-insurance providers. AMFI is governed by a General Assembly and gets her leadership from a Board of Directors who are experienced practitioners who run some of the leading microfinance Institutions in Kenya. Examples of deposit taking microfinance institutions are; Faulu Kenya DTM Limited, Kenya Women Finance Trust DTM Limited, SMEP Deposit Taking Microfinance Limited, Rafiki Deposit Taking Microfinance, UWEZO Deposit Taking Microfinance Limited, Century Deposit Taking Microfinance Limited, SUMAC DTM Limited, U&I Deposit Taking Microfinance Limited and UNAITAS (Previously Muramati Sacco) Sacco Society Ltd.

1.2 Statement of the Problem

Technology is consistently cited as one of the greatest challenges faced by microfinance institutions (MFIs). It is widely recognized that technology is invaluable for improving efficiency, accuracy, increasing outreach and reducing costs. Many MFIs lack sufficient funds to invest in suitable backend technologies, or operate in regions where access to critical infrastructure such as the Internet remains scarce (Rosenberg, 2009).

Locally, a study by Gatana (2009) on the growth and improvement of information communication technology in Kenya indicated that despite the developments in Information and Communication Technology, internet growth is constrained by infrastructure, low bandwidth and high-dial-up tariffs levied on internet users. Such factors severely limit internet access. Kipkech (2009) also did a study on the evaluation of the application of e-commerce models by microfinance institutions in Kenya and established that internet connection failures disrupt communication and distort information content thus playing a major role as a challenge to the application of e-commerce system in the Micro-finance institutions. Thus, though the empirical evidence shows that MFIs have experienced growth in diffusion of ICT in their operations, internet connectivity remains a challenge.

It is against this background therefore that the study sought to establish how the various aspects of internet connectivity in the Kenyan MFIs, such as infrastructure, bandwidth, WAN optimizations and cost of applications affect the organizations' performance. This study sought to establish the effect of Internet connectivity on the performance of microfinance deposit taking institutions in Kenya.

1.3 Objectives of the Study

i. To examine the effect of infrastructure on performance of deposit taking microfinance institutions in Kenya.
ii. To assess the effect of bandwidth on performance of deposit taking microfinance institutions in Kenya.

iii. To explore the effect of WAN optimizations on performance of deposit taking microfinance institutions in Kenya.
iv. To determine the effect of Cost of Applications on performance of deposit taking microfinance institutions in Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Review: Diffusion of Innovation Theory

This theory was developed by Littlejohn in 1996. The theory states that a new internet begins at its point of origin and spreads through the surrounding geographic areas (Littlejohn, 1996). According to this theory, once a certain number of individuals in a system adopt an innovation, it will continue to spread in without any interruption or interference. This theory can be used to explain the phenomenon at hand since most deposit taking microfinance institutions are lay more emphasis on development of system within their organization with less regards in ensuring absorption of the system in the entire organization. This is a clear indication of intra-organizational digital divide.

The diffusion theory is critical in this study. Diffusion theory offers a rich perspective on innovation and the forces that drive adoption of innovations and those that restrain them. The diffusion theory argues that characteristics of innovations affect the rate of adoption. In this study, the innovation is internet connectivity. The theory will therefore guide this study in establishing whether the characteristics of the internet connectivity in MFIs which is operationalized by the existing infrastructure, bandwidth, WAN optimizations and cost of applications affects internet connectivity in MFIs and how it further affects their performance

2.2 Empirical Review

Studies such as Bazar and Boalch (2007) aimed at establishing factors that are significant to internet connectivity in developing countries; their study found out that infrastructure, government policies and regulations, economic development and IT penetration are the major factor that hinders internet connectivity. The real problem with Internet connectivity is that business-critical applications are generally in direct competition with all other Internet traffic on your link. Often business applications are delayed because of unwanted traffic to a site. Spam, viruses, and even worker-driven Web traffic can tremendously hinder a business's ability to complete its mission (Kerner, 2009).

Rogers (2000) noted that the internet connectivity is mostly experienced in urban areas among the comparatively wealthy and educated. He noted that much of the infrastructure needed for the rapid diffusion of the Internet is not found in the rural areas basing his case in India. He elaborates his findings by indicating that many villages in India do not have central electricity or telephone service and cannot afford a computer. This phenomenon is applicable in Kenya since it will not be economical to lay fiber optic cable.

McKinsey survey of 554 SMEs in the organized sector in India of 2012 shows that India is ranked 49 out of 57 countries on Internet infrastructure and environment, India has only approximately 6 percent of the number of secure Internet servers per capita that Brazil or South Africa has. Average bandwidth per capita in India is significantly lower than in many other aspiring countries. The penetration of PCs is only 47 per 1,000 people, which is much lower than in Argentina, Mexico, the Philippines, or Vietnam. Internet penetration among India’s large rural

population is just one-twelfth that of the urban population. Low availability of basic infrastructure is a key bottleneck in rural areas (Chandra et al., 2012).

Sentiments of Urosso *et al.* (2009) are that one force necessary for the establishment of a networked world, especially in developing and rural areas, is the market. It is commonly assumed that effective rural ICT access requires economic subsidy and financial loss; he however, recommends that ICTs should be economically viable if they are to gain wide, robust, and long- lived usage. While the path to realizing such economics will vary across countries, settings, cultures, and technologies internet connectivity to the rural areas is still possible.

3.0 RESEARCH METHODOLOGY

This study was a descriptive survey. The method was chosen since it was used to obtain information that describes existing phenomena by asking individuals about their perceptions, attitudes, behaviors or values. The study focused on the entire deposit taking microfinance deposit taking institutions in Kenya.

According to the Association of Micro-Finance Institutions (2014), there were 9 registered deposit taking microfinance institutions in Kenya. They include; Faulu Kenya DTM Limited, Kenya Women Finance Trust DTM Limited, SMEP Deposit Taking Microfinance Limited, Rafiki Deposit Taking Microfinance, UWEZO Deposit Taking Microfinance Limited, Century Deposit Taking Microfinance Limited, SUMAC DTM Limited, U&I Deposit Taking Microfinance Limited and UNAITAS (Previously Muramati Sacco) Sacco Society Ltd. The target population for this study was 95 respondents from nine different deposit taking microfinance institutions in Kenya. The sample size for the study was therefore 95 respondents who included 9 management staff and 86 general staff in the ICT departments of the nine Deposit taking Microfinance Institutions in Kenya.

The researcher personally administered the questionnaire to the respondents. However, where the respondents were busy or unable to fill the questionnaires at that moment drop and pick later method was adopted. The filled in questionnaires containing data collected from the field were cleaned for errors before it is entered into the Statistical Package for Social Sciences (SPSS). The SPSS software aided the data analysis process. The questionnaires generated qualitative and quantitative data. The qualitative data was generated from the open ended questions and were categorized in themes in accordance with research objectives and reported in narrative form along with quantitative presentation.

The quantitative data was analyzed using descriptive and inferential statistics. This included frequency distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies. The inferential statistics included a regression model which will establish the form of relationship between variables.

The regression analysis helped to identify the most significant variables of internet connectivity in relation to performance of the DTMs in Kenya. Data was presented using tables, charts and graphs. The regression took the following form:

$$Y= \beta_0 + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 + \beta_4 \chi_4 \epsilon$$

Where: Y = Dependent Variable

χ_1 = independent variable

β_0 = the constant

β_{1-n} = the regression coefficient or change included in Y by each χ

ϵ = error term

4.0 RESEARCH FINDINGS AND DISCUSSION

4.1 Response Rate

The study targeted 95 respondents who included the management and the general staff from nine Deposit Taking microfinance institutions. A total of 76 questionnaires were completely and successfully filled in time for data analysis giving a response rate 80%.

4.2 Infrastructure and Internet Connectivity

In this section, the study addresses the first specific objective which sought to determine effect of infrastructure on internet connectivity and the organization performance of deposit taking microfinance institutions in Kenya.

4.2.1 Infrastructure and its Effect on Internet Connectivity

The respondents were asked to indicate whether their organization had the following infrastructure to enhance internet connectivity. The results were analyzed using means and standard deviation. The findings are presented in Table 1 below.

Table 1: Infrastructure and Internet Connectivity

Statements on Infrastructure	Yes		No	
	F	%	F	%
The internet service provider is reliable	37	48.7	39	51.3
The computer equipments connected with internet are adequate	28	36.8	48	63.2
The computer equipments have high processors and RAM to ensure fast surfing on the internet	24	31.6	52	68.4
Web server applications meet the organization's requirements	35	46.1	41	53.9
Web server application deployed is configured, and managed to meet the security requirements of the organization.	46	60.5	30	39.5

The study shows that 68.4% of the respondents disagreed that the computer equipments had high processors and RAM to ensure fast surfing on the internet while 63.2% indicated that the computer equipments connected with internet were not adequate. On the other hand, 51.3% of the respondents revealed that internet service provider was not reliable 53.9% reported that the web server applications did not meet the organization's requirements. However, majority of the respondents (60.5%) agreed that the web server application deployed was configured, and managed to meet the security requirements of the organization.

4.2.2 Extent Infrastructure Affect Internet Connectivity

The respondents were asked to indicate the extent to which infrastructure affected internet connectivity in the organization. The results are presented in Figure 1.

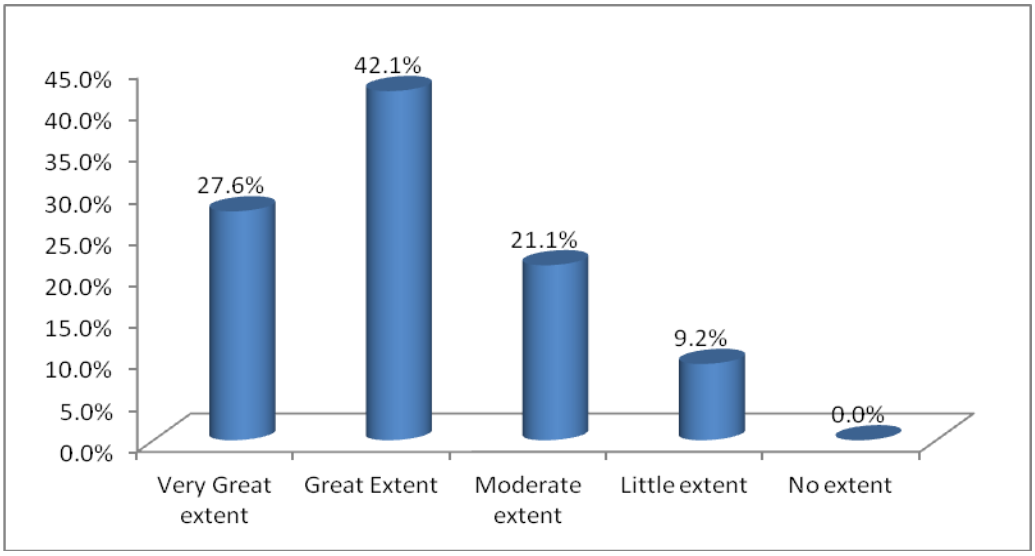

Figure 1: Extent Infrastructure Affect Internet Connectivity

The study results show that 42.1% of the respondents reported that which infrastructure affected internet connectivity in the organization to a great extent; this was supported by 27.6% of the respondents who indicated that the infrastructure affected internet connectivity to a very great extent. However, 21.1% of the respondents reported that infrastructure affected internet connectivity in the organization to a moderate extent while 9.2% revealed to a little extent.

4.3 Bandwidth and Internet Connectivity

This section addressed the second objective of the study which sought to establish the effects of bandwidth on performance of deposit taking microfinance institutions in Kenya. The study also sought to determine the extent to which bandwidth affect internet connectivity in the MFIs.

4.3.1 Effect of Bandwidth on Internet Connectivity

The study sought to find out how bandwidth affected internet connectivity in deposit taking microfinance institutions in Kenya. The findings are presented in Table 2

Table 2: Effect of Bandwidth on Internet Connectivity

Statements on Bandwidth	Yes		No	
	F	%	F	%
Data Centre has a large amount of network bandwidth to accommodate data transfer in and out of it.	33	43.4	43	56.6
The average rate of successful data transfer is efficient	20	26.3	56	73.7
The current bandwidth affects the performance of the internet in the organization	54	71.1	22	28.9
Our internet connectivity is affected by limited bandwidth	42	55.3	34	44.7
We experience slow access to data and applications over the Internet or a wide area network	38	50.0	38	50.0

The findings show that majority of the respondents (73.7%) reported that the average rate of successful data transfer was not efficient while 71.1% of the respondents revealed that the current bandwidth affected the performance of the internet in the organization. On the other hand, 56.6% of the respondents indicated that the data centre did not have a large amount of network bandwidth to accommodate data transfer in and out of it. The findings also show that 55.5% revealed that internet connectivity was affected by limited bandwidth.

4.3.2 Extent Bandwidth affect Internet Connectivity

The respondents were asked to indicate the extent to which bandwidth affected internet connectivity in their organization. The results are presented in Table 3

Table 3: Extent Bandwidth affect Internet Connectivity

Extent	Frequency	Percentage
To a Very Great extent	18	23.7
Great extent	31	40.8
Moderate Extent	24	31.6
Little extent	3	3.9
No extent	-	-
Total	**76**	**100.0**

The study results show that 40.8% revealed that bandwidth affected internet connectivity in their organization to a great extent while a further 23.7% indicated that it affect ted to a very great extent. On the other hand, 31.6% of the respondents indicated that bandwidth affected internet connectivity in their organization to a moderate extent while 3.9% reported that it affected to a little extent. The findings generally show that majority of the respondents indicated that bandwidth affected internet connectivity in their organization to a great extent.

4.4 WAN Optimization

This section of the study sought to address the third objective of the study. The respondents were asked to indicate the WAN optimization techniques used in their organizations and how WAN Optimization affects internet connectivity in their organization. The study also sought to establish the extent to which WAN Optimization affect internet connectivity in their organization.

4.4.1 WAN Optimization in the MFIs

The respondents were asked to indicate whether WAN connectivity in their organization was optimized. The findings are presented in Figure 2.

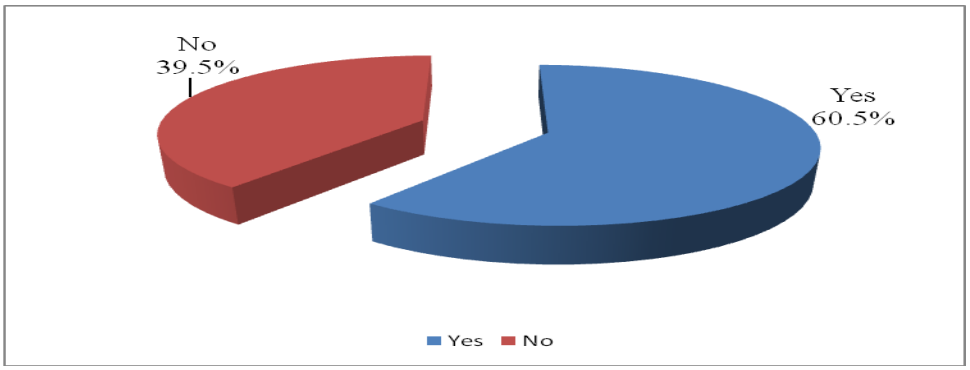

Figure 2: WAN Optimization

Results in Figure 2 shows that 60.5% of the respondents reported that WAN connectivity in their organization was optimized. However, 39.5% of the respondents indicated that the WAN connectivity was not optimized.

4.4.2 WAN optimization Techniques Used

The respondents were asked to indicate the WAN optimization Techniques used by their organizations. The findings are presented in Table 4.

Table 4: WAN optimization Techniques

Techniques	Frequency	Percentage
Data reduction	22	28.9
Compression	26	34.2
Latency Optimization	12	15.8
Caching/proxy	16	21.1
Total	**76**	**100.0**

The findings show that 34.2% of the respondents indicated that they used compression while 28.9% used data reduction techniques in WAN optimization. A further 21.1% of the respondents indicated that they used Caching/proxy technique while only 15.8% used latency optimization. This shows that different MFIs used varying WAN optimization techniques. WAN optimization seeks to reduce latency and improve better bandwidth utilization for applications. So companies need to understand the WAN optimization that offers maximum effectiveness.

4.4.3 Effects of WAN Optimization on Internet Connectivity

The respondents were asked to indicate how WAN Optimization affects internet connectivity in their organization. The findings are presented in Table 5.

Table 5: Effects of WAN Optimization on Internet Connectivity

Statements	Yes		No	
	F	%	F	%
WAN optimization have led to faster connection/ increased data transfer efficiencies	58	76.3	18	23.7
WAN optimization techniques adopted in the organization has improved user efficiency.	52	68.4	24	31.6
The optimization have improved data replication times across the WAN	49	64.5	27	35.5

Results in Table 5 show that 76.3% of the respondents reported that WAN optimization had led to faster connection/ increased data transfer efficiencies while 68.4 also indicated that WAN optimization techniques adopted in the organization had improved user efficiency. On the other hand, 64.5% of the respondents revealed that the optimization had improved data replication times across the WAN.

4.4.4 Extent WAN Optimization Affect Internet Connectivity

The study sought to establish the extent to which WAN Optimization affected internet connectivity in the MFIs in Kenya. The findings are presented in Table 6.

Table 6: Extent WAN Optimization Affect Internet Connectivity

Extent	Frequency	Percentage
To a Very Great extent	27	35.5
Great extent	32	42.1
Moderate Extent	14	18.4
Little extent	3	4.0
No extent	0	0
Total	**76**	**100.0**

The study shows that 42.1% of the respondents revealed that WAN Optimization affected internet connectivity to a great extent while 35.5% indicated to a very great extent. However, 18.4% indicated that WAN Optimization affected internet connectivity to a moderate extent.

4.5 Cost of Applications

This section addresses the fourth objective of the study. The respondents were asked to indicate how the cost of applications affects internet connection in the organization. The respondents were also asked to indicate the extent to which cost of applications affect internet connectivity in their organization.

4.5.1 Effect of Cost of Applications on Internet Connectivity

The respondents were asked to indicate whether the cost of applications affect internet connection in MFIs in Kenya. The results are presented in Table 7.

Table 7: Effect of Cost of Applications on Internet Connectivity

Statements	Yes		No	
	F	%	F	%
Cost of applications is high	62	81.6	14	18.4
The cost of applications is affordable	19	25.0	57	75.0
The cost of maintenance of applications used in internet connectivity is high	52	68.4	24	31.6

Majority of the respondents (81.6%) reported that the cost of applications was high while 68.4% revealed that the cost of maintenance of applications used in internet connectivity was high. On the other hand, 75% of the respondents disagreed that the cost of applications was affordable. From the results, it implies that cost of applications for internet connectivity is high which means that the organizations may be using large amounts of their capital to invest in internet connectivity.

4.5.2 Extent Cost of Applications Affect Internet Connectivity

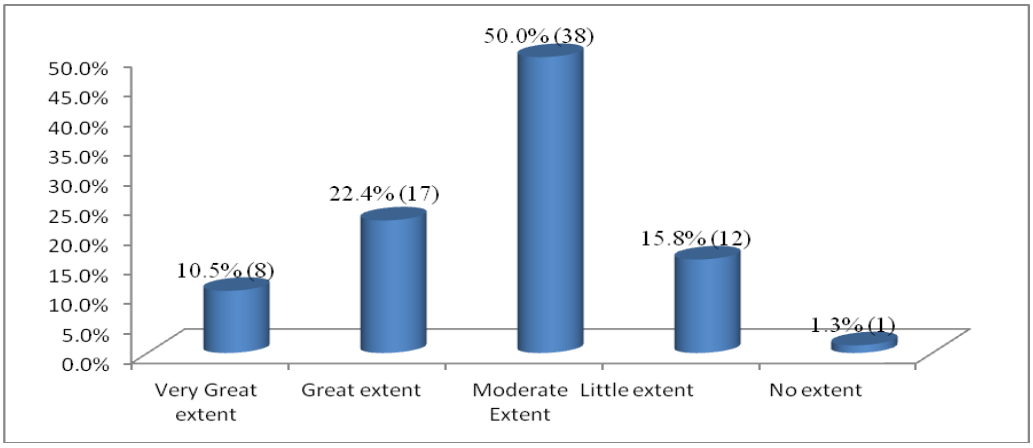

Figure 3: Extent Cost of Applications Affect Internet Connectivity

Figure 3 shows that 50% of the respondents revealed that cost of applications affect internet connectivity to a moderate extent. However, 22.4% reported that cost of applications affect internet connectivity to a great extent while 10.5% indicated to a very great extent.

4.6 Internet Connectivity and Performance

The study sought to establish how internet connectivity affects the various performance aspects in the MFIs in Kenya. The findings are presented Table 8.

4.6.1 Effect of Internet Connectivity on Performance

Table 8: Effect of Internet Connectivity on Performance

Performance Indicators	Yes		No	
	F	%	F	%
Internet use has positive effect on sales	35	46.1	41	53.9
Internet have enhanced interactive marketing and improved relationship with customers	52	68.4	24	31.6
Internet use has improved customer service in the organization	48	63.2	28	36.8

Internet use has improved communication within and outside the organization	46	60.5	30	39.5
Internet use has positive effect on return on asset	22	28.9	54	71.1

The study results shows that 68.4% of the respondents indicated that internet connectivity had enhanced interactive marketing and improved relationship with customers while 63.2% revealed that internet use had improved customer service in the organization. On the other hand, 60.5% of the respondents reported that the internet had improved communication within and outside the organization. However, 71.1% disagreed that internet use had a positive effect on return on asset. The results show that majority of the respondents indicated that internet connectivity enhanced performance of MFIs.

4.6.2 Extent Internet Connectivity Affect Performance of the MFI

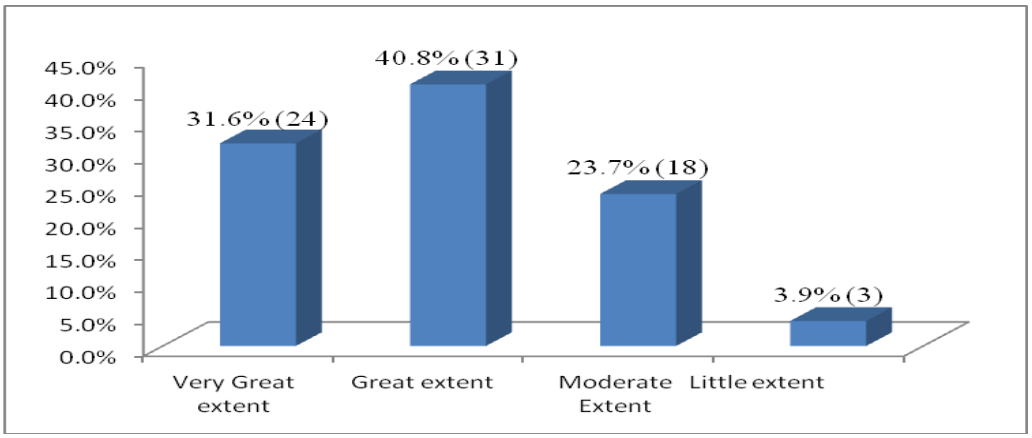

Figure 4: Extent Internet Connectivity Affect Performance of the MFI

Results in Figure 4 shows that 40.8% of the respondents indicated that internet connectivity affected performance of their institutions to a great extent while 31.6% indicated that it affected to a very great extent. However, 23.7% reported that internet connectivity affected performance of their institutions to a moderate extent.

4.7 Relationship between Internet Connectivity and Performance of MFIs

A multivariate regression model was applied to determine the form of relationship between internet connectivity and performance of MFIs. The independent were: infrastructure, bandwidth, wan optimization and cost of applications while the dependent variable was performance.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.742(a)	0.551	0.510	0.748

Predictors: (Constant), infrastructure, bandwidth, wan optimization, cost of applications

The R Square is the coefficient of determination and tells us how performance of MFIs in Kenya varied with internet connectivity. The regression model summary results in Table 4.10 shows that the value of the Adjusted R-squared is 0.510. This implies that infrastructure, bandwidth, wan optimization, cost of applications explained 51% of performance of in MFIs in Kenya at a

95% confidence level. The remaining 49% would be explained by other variables not included in the specific variables of the study.

Table 10: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	30.216	4	7.554	13.511	0.000(a)
	Residual	39.689	71	0.559		
	Total	**69.905**	**75**			

a - Predictors: (Constant), infrastructure, bandwidth, wan optimization, cost of applications

b - Performance of MFIs

The study used ANOVA to establish the significance of the regression model from which an f-significance value of p=0.001 was established. This shows that the regression model has a less than 0.001 likelihood or probability of giving a wrong prediction. This therefore means that the regression model has a confidence level of over 95% hence high reliability of the results.

Table 11: Coefficients Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.988	0.604		1.636	0.109
Infrastructure	0.135	0.093	0.172	2.446	0.015
Bandwidth	0.963	0.176	0.763	5.484	0.000
Wan optimization	0.485	0.242	0.277	2.000	0.050
Cost of applications	-0.262	0.193	-0.187	-1.360	0.181

Dependent Variable: Performance of MFIs

The study shows that there was a positive association between performance of MFIs in Kenya and three internet connectivity variables as shown; infrastructure (β=0.135), Bandwidth (β = 0.963), Wan optimization (β = 0.485). However, there was a negative relationship between performance of MFIs and cost of applications as shown by β = -0.262). The study further established that there is a significant relationship between performance of MFIs in Kenya and three of the variables: infrastructure p=0.015<0.05), Bandwidth (p=0.000<0.05), Wan optimization (p=0.050<0.05).

5.0 DISCUSSION CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study concludes that there is a positive and significant relationship between infrastructure and performance of MFIs in Kenya. However, the computer equipments computer equipments connected with internet were not adequate. The internet service provider was not reliable while

the web server applications did not meet the organization's requirements. There is a positive and significant

Relationship

between bandwidth and performance of MFIs in Kenya. The internet connectivity in MFIs was affected by limited bandwidth while the average rate of successful data transfer was not efficient. The data centre also did not have a large amount of network bandwidth to accommodate data transfer in and out of it; and that that.

The study concludes that there is a positive and significant association between WAN optimization and performance of MFIs in Kenya. WAN optimization in the MFIs was done through techniques such as compression, data reduction, Caching/proxy and latency optimization. WAN optimization led to faster connection/ increased data transfer efficiencies and improved user efficiency.

The study also concludes the cost of applications was high and that the cost of maintenance of applications used in internet connectivity was also high. The increased cost of applications affected the performance of MFIs in Kenya but to a moderate extent.

5.2 Recommendations

The study recommends that the management of MFIs in Kenya should improve on the existing IT infrastructure so as to improve internet connectivity in their firms. The computer equipments should have high processors and RAM to ensure fast surfing on the internet. The web server application deployed should also be well configured, and managed to meet the security requirements of the organization.

The management of MFIs should also improve bandwidth to maximize the internet speed since it affects employees' productivity due to data limitations or low speeds. The data centre should also have a large amount of network bandwidth to accommodate data transfer in and out of it. High speed internet would improve customer service and improve service delivery for those services offered through the internet.

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