ICT Usage in Microfinance Institutions in Uganda

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Abstract

Microfinance institutions (MFIs) are always often faced with high operating costs to provide financial services to the poor people and Small and Medium Enterprises. Information and Communication Technologies (ICTs) has been found to promote the dual objective of microfinance - sustainability and outreach to the poor people. Using a quantitative survey and descriptive research approach, this paper has established the extent to which ICT has been used in the microfinance institutions in Uganda. Despite the barriers, ICT usage in MFIs has been on the rise; and different applications and technologies have been adopted by some MFIs to control costs, create efficiency and effectiveness in their operations, improve productivity, and increase outreach to the poor. Available ICT policies such as tax exemption on computer hardware are not sufficient to achieve the desired growth. Therefore the need for progressive policies that relate to ICT-based services and software to accelerate ICT usage especially in MFIs. The paper has provided a benchmark that can be used for further research especially in developing countries.

Keywords

ICT Usage in Microfinance Institutions in Uganda

INTRODUCTION

The Uganda financial sector is made of formal and informal institutions. Most of the formal institutions are located in or close to urban areas, leaving the informal mostly to the rural areas. It is estimated that only 10% of the rural population and 5% of the rural poor have access to formal financial services (Nanyonjo and Nsubuga, 2004). The financial services in the rural areas are supported mainly by the informal Savings and Credit Cooperative Societies (SACCOs), also known as Micro Credit Development Trust (MCDT), and a few formal Microfinance Institutions (MFI).

The majority of the Uganda population (i.e. more than 80%) lives in rural areas and 34.2% live below the absolute poverty line. In the urban areas, the people living below the poverty line form 13.7% (Ssewanyana and Okidi, 2007). The government has taken several initiatives to address poverty in the country. Therefore the percentage of people below the poverty line declined from 56 % in 1992 to 31 % in 2005 (The Republic of Uganda, 2006). Several interventions have been undertaken and proposed by the Government of Uganda, and microfinance has been identified as one of the strategies for poverty alleviation. Provision of microfinance services reduces poverty as they enable the poor to increase their household income, expand their asset base, and also improve their livelihood (Parikh, 2006; Hishigsuren, 2006). This has been further supported by the father of microfinance Mohammad Yunus, the founder of Grameen Bank in Bangladesh who surmises that 5% of the clients of the Grameen Bank exit poverty every year (The Economist, 2009).

It is noted that MFIs serve as better avenues for providing microfinance services to the disadvantaged members of society and small and medium enterprises (SMEs), than the well established financial institutions (Parikh, 2006). Yet, MFIs face a lot of challenges, as most of their served customers depend on agriculture which is subject to weather risks, seasonality and poor productivity, and involve weak SMEs. The customers are mostly rural dwellers and live in geographically dispersed areas with sparse population, and have limited financial transactions. Other customers live in urban areas which have very poor infrastructure. These challenges increase transactions costs for services provided by the MFIs. To succeed, MFIs should be efficient through the use of technological innovations.

In Uganda, commonly used information and communication technologies (ICTs) include management information systems (MIS), personal digital assistants (PDA), automated teller machines (ATMs), mobile phones, and smart cards (Ssewanyana, 2008). MIS is important to MFIs as it is the backoffice and backbone of any ICT innovation for microfinance services, as it can effectively support loan portfolio, transactions, operational growth, decision making, transparent and quality services to the client, time management, and increased outreach (Turaga, 2004). PDAs also can help MFIsto save time on micro lending, lower operational costs, reduce human errors, allow loan officers to increase outreach, reduce paper work, and standardize credit processes (Turaga, 2004).

According to Brynjolfsson and Hitt (2000), 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.

While some MFIs belong to SMEs which are characterized by limited technology and management capabilities (Caldeira and Ward, 2002), and a plethora of studies on SMEs and ICT usage (Harindranath et al., 2008, Ssewanyana and Busler, 2007 and Frempong, 2007) have been carried out, none of these studies focus specifically on MFIsand ICT usage in developing countries.

This paper seeks to establish the extent to which ICT has been used in microfinance institutions in Uganda and the benefits derived. Specifically, it aims to establish a benchmark that can be used for further research; information that can be used for comparison between countries; and information that can be used by policy makers to support the microfinance sector through ICT.

The rest of the paper is structured in seven sections. The first section is the introduction. The second section examines the literature on microfinance and ICTs in developing countries. This third section presents an overview of the microfinance sector in Uganda. The fourth section presents the research methodology. The fifth and sixth sections present the results and discussion of the study. The seventh section concludes with the implications and recommendations.

ICT AND MICROFINANCE IN DEVELOPING COUNTRIES

Studieshave established that small depositors and small businesses are good savers, and they always want to leave their money intact, unless they have a serious need for money (Asian Development Bank, 2000; Sanchez, 2003). They are also generally diligent in paying off their obligations. The loan recovery is usually more than 95% (Feiner, 2003). These developments have spurred the growth of microfinance institutions. The microfinance sector has grown exponentially in the last decade with a turnover estimated at US$2.5 billion worldwide, and it is expected to grow further with the introduction of mobile banking. The World Bank has estimated 7000 MFIs globally serving 16 million people in developing countries; and 13 million are micro-creditors with US$7 billion in outstanding loans with a repayment rate of more than 95% (Kashyap, 2009).

The impediments to the success of MFIs in developing countries are the scalability, sustainability, outreach, and the impact of the various microfinance initiatives (Kashyap, 2009). These impediments can only be overcome through the usage of ICT to maximize outreach and sustainability (Kashyap, 2009; Gibson and Meehan, 2002). ICT is an enabler of affordable solutions to MFIs. It can enable MFIs to reach remote rural based clients in an effective low cost manner. Rao (2003) observed that for an MFI, transaction costs are one of the crucial bottlenecks to increase profits and to achieve long-term sustainability. ICT has been found to alleviate some of the problems faced by MFIs through provision of secure, low cost, and reliable means of transactional data capture and successful transfer MFIs (Filpo, 2006).

ICT offers various benefits to clients and MFIs in various countries. The benefits to clients have been identified as access to banking services, more convenient services, faster loan processing, less time in queues; and for the MFIsas reduced transaction costs, less fraud, improved quality of financial information, increased outreach, reduction in operational costs, and increase in customer satisfaction and loyalty (Hishigsuren, 2006). ICT has been used to create "branchless banks" through mobile banking, automated teller machines (ATM), and point-of-sale (PoS) networks among others where clients can access various financial services. Rogers (2007) examined the role of ICT and in particular mobile phones in the delivery of financial services in five countries and summarized it as follows. In Philippines, more than 2 million people are using their phones as mobile wallets to receive and send payments, pay utility bills among other services. In India, rural farmers and MFIs are using mobile phones to do bookkeeping, receive and send payments and to pay utility bills. In addition, handheld devices and smart card technology are used to automate loan processing and tracking. Biometric ATMs with smart cards are used for financial transactions without the need for personal identification. In Bolivia, ATMs capable of speaking in local languages are being used to provide financial services including depositing and withdrawing funds without filling forms, and to facilitate funds transfer. In Peru, phone-based systems with voice prompts are being used to provide financial services in rural areas. In South Africa, Wizzit, a virtual bank uses mobile banking for their clients to send and receive domestic and international payments. In East Africa, the telecom companies of Safaricom, MTN Uganda and Zain are offering financial services of sending and receiving domestic and international payments. Safaricom alone serves more than seven million users with an agent's network that exceeds the total number of bank branches in Kenya (Kinyanjui, 2009).

The diffusion of ICT in the operations of MFIs in developing countries is growing (CGAP, 2006). Despite the high diffusion, there are challenges that are to do firstly with the limited infrastructure in terms of mobile network and Internet bandwidth in most of the countries, which limits outreach to rural areas; secondly, illiterate clients not having personal identification nor credit history requires MFIs to invest in more sophisticated technologies to serve them; thirdly, computer illiteracy of the borrowers; fourthly, limited funding to invest in the infrastructure, human resources and the ICT; and lastly, the high costs of administering small transactions on savings accounts, money transfer and loans to poor people provide low profit margins (Amin, 2007, Hishigsuren, 2006, and Mathison, 2005) .

With these challenges, there is a lot to be done for ICT to enable MFIs meet their dual objectives of outreach and sustainability.

MICROFINANCE SECTOR IN UGANDA

The Microfinance sector in Uganda is made of formal and informal MFIs. The formal institutions are either companies which are regulated under the banking laws; financial intermediaries which are not banks but regulated by the government as Microfinance Deposit-taking Institutions (MDI); non-regulated companies that offer only credits; or formally registered cooperatives and societies that serve their members. The formal institutions are members of the Association of Microfinance Institutions of Uganda (AMFIU). There are two banks, four MDIs, thirty one Credit only MFIs, and forty one Savings and Credit Cooperative Societies (SACCOs). The informal institutions are those SACCOs which are not registered by the government. These

institutions have been ranked and categorized by Bank of Uganda and AMFIU, based on their size and level of operation. Table 1 shows the structure of the microfinance industry in Uganda as cited in Nanyonjo *et al.* (2004).

Category	Number	Characteristics
A	5 – 8	At or nearing operational or financial self-sustainability. Well documented operational procedures. Fairly good MIS, well qualified management and staff. Applying microfinance best practices. Often registered as companies limited by guarantee. Active clients over 10,000.
B	10 - 15	Mainly NGOs. Also registered as companies limited by guarantee. Charge market interest rates, have adapted a business-oriented approach to poverty alleviation, and are moving towards Operational Self-sufficiency (OSS). Fair documentation of procedures and MIS. Good management, OSS at levels between 50% and 85%. Active clients range from 5,000 to 10,000.
C	40+	Mainly small local NGOs with limited resources and clientele. Fairly familiar with "Best practices" and are within the industry's information loop. However, most have modestly qualified management and are still far from reaching OSS (35% to 49%). Active clients ranging from 500 to 3,000.
D	Numerous	Small community based organizations, generally not well known in the sector. Largely outside the national microfinance best practices. Focused on rural outreach but have minimal number of clients.

Source: Nanyonjo and Nsubuga (2004)

Table 1: Structure of the Microfinance Industry in Uganda

MFIs are geographically distributed throughout the country (see Table 2). Those in in category A and B are mostly found in the urban areas, and those in category C and D in the rural areas.

Region	Number of MFIs	% Rural	% Semi-Urban	% Urban
Central	291	37	15	48
Eastern	281	60	15	25
Western	494	59	17	24
Northern	360	65	15	20

Source: Nanyonjo and Nsubuga (2004)

Table 2: Geographic Distribution of MFIsin Uganda

METHODOLOGY

Research Design

The research design was based on a quantitative survey approach due to its popularity and flexibility in getting answers (Pataraporn, 2007). It was a descriptive research which describes a distribution of a phenomenon in a population to ascertain the facts (Grover, 1997). The sample was selected from 78 members of the Association of Microfinance Institutions in Uganda (AMFIU). These members commit themselves to adhere to the Microfinance Consumer Code of Practice, and conduct business in a professional manner in line with microfinance sound practices. A sample of 36 institutions was purposively selected from the directory of AMFIU. The purposive sampling technique is the most suitable for small populations (Jarvinen, 2000). The sample covered the two banks, four MDI, 21 Credit only MFIs in category A and B, and 8 SACCOs in category C. Few SACCOs were selected in the sample as they had almost similar characteristics.

A simple questionnaire was designed and divided into five sections (see Appendix A). The first section provided general information; the second section was on computer usage; the third section focused on the IT department; the fourth section was on Internet usage; and fifth section was on ICTs and MFIs performance. The questionnaires were designed in such a way that they could easily be self-administered. Self-administered questionnaire are easy to administer, provide quick responses, and the analysis is faster and suitable for computer based research methods (Jarvinen, 2004). Where the questionnaire could not be filled and picked on the first visit, additional visits were made.

The analysis was carried out at the institutional level. Descriptive analysis was done on the data, and most of the results presented in bar charts for easy interpretation.

Quality of instruments

Several authors including Wynd, Schmidt and Schaefer (2003), and Grover (1997) have discussed the different approaches to content validation. In order to address the content validity of the instrument in this study, the design of the questionnaire was based on literature from previous similar studies (Ssewanyana and Busler, 2007; Nielinger, 2003), and pre-existing questions that were modified to suite the current study. Hyman, Lamb and Bulmer (2006) have stated that using pre-existing survey questions provide accurate measures as they are pre-tested before first usage, such that the degree of validity and the quality of data are likely to be high.

The questionnaire was pre-tested in four MFIs to establish the suitability of the questions. Some questions were reviewed based on the comments and suggestions from the respondents. The reliability of the instrument was tested using Cronbach's alpha coefficient which was found to be 72 percent.

RESULTS AND DISCUSSION OF THE FINDINGS

General characteristics

Out of the response rate of 71 percent, 52 percent of the respondents were located in Kampala city; 20 percent in urban; 12 percent in semi-urban; and 16 percent in rural areas. 88 percent of the MFIs had computers and ninety percent of them had access to the Internet. It is a few SACCOs in rural areas which had neither computers nor Internet due to lack of the required infrastructure that include electrical power, wireless communication, Internet service providers among others for the Internet. The absence of computers was due to lack of appreciation of the benefits associated with ICTs, and preferring to use manual systems. All the banks and MDIs had access to the Internet, and only 92% of Credit only MFIs and 75% of the SACCOs had access to the Internet.

Period of Computer and Internet Usage

Table 3 illustrates the percentage of MFIs and the period they had used the computers and Internet. The banks have been using the computers and the Internet for >5 years. The MDIs had computers for >5 years, only 67 percent of them had used the Internet for >5 years. The Credit only MFIs had an average usage of computers between 3-5 years, and the majority (50%) had used the Internet for <3 years. Fifty percent of the SACCOs had owned computers for <5 years, and 67 percent had used the Internet for <3 years and 33 percent for >5 years. This indicates that ICT diffusion in MFIs has been there for quite a long time. As expected, the larger the size of the firm, the more likely to have acquired ICT for a longer period. This is associated with the high level of education of the top decision maker, who easily appreciates the benefits of ICTs (Ssewanyana and Busler, 2007). Perceived benefits have been found to be a critical factor in the adoption and usage of ICTs, as it also leads to other benefits (Chapman, James-Moore, Szczygiel, and Thompson, 2000). The large MFIs have the institutional and financial stability that spurs high investments in technology for future growth.

Type	COMPUTER			INTERNET		
	<3 years	3 - 5 years	> 5years	<3 years	3 - 5 years	> 5years
Bank			100			100
MDI			100		33	67
Credit only MFI	8	50	42	55	18	27
SACCO	33	17	50	67		33

Table 3: Duration of Computer and Internet Usage by Type of MFIs(%)
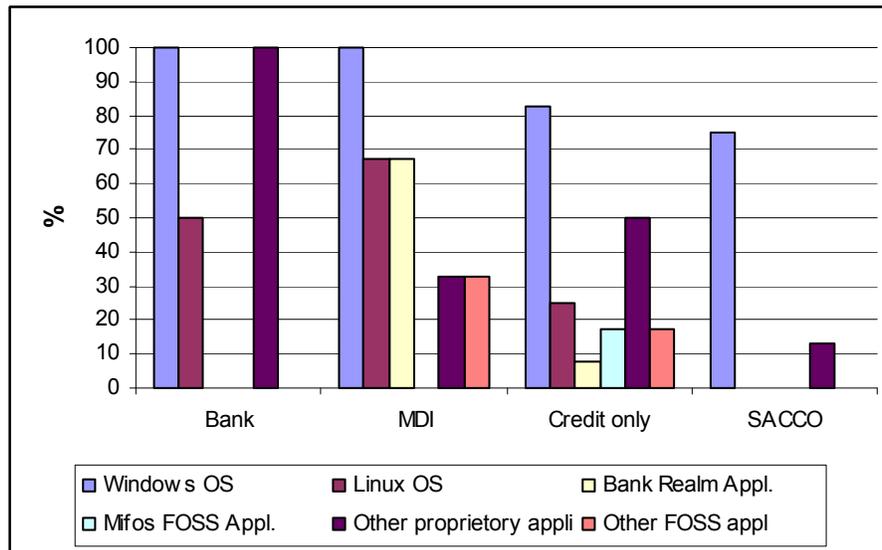
Software Usage

Figure 1: Software Usage

Figure 1 depicts the software usage in MFIs. The results suggest that the nature of software being used by a MFI can indicate the size and performance of that MFI. The larger the client size, the likelihood of using a well developed and tested software. The Banks and MDIs were using both Windows and Linux operating systems, while the majority of Credit only MFIs were using Windows operating system and only 25% were using Linux operating system. The SACCOs were using only windows operating system. As for the applications, the MDIs on Windows platform were using Bank realm (67%), and other proprietary software including Equinox banking systems, Microsoft exchange and Sparrow ATM switch. The MDIs on the Linux platform were using Finacle which is free and open source software (FOSS). FOSS are software that allow the users to study, change, and improve their design through the given source code. The banks were using other types of proprietary software applications.

The Credit only MFIs and SACCOs on Windows platform were using Finance solutions, Equinox, Loan performer, Quickbooks and MS Excel which are proprietary software. Those on the Linux platform were using Mifos which is an open-source software. The pattern of software usage is not very different from other countries, whereby the large MFIs were using proprietary software and the small MFIs using either off-the-shelves or free software offered by Non-Government Organisations (NGOs). This suggests that the small MFIs are cost cautious. The usage of the application software is in contrast with the CGAP study that stated 46% of the respondents were using customized solutions, only 10% were using off-the-shelf products and 44% had no ICT solution (CGAP, 2005).
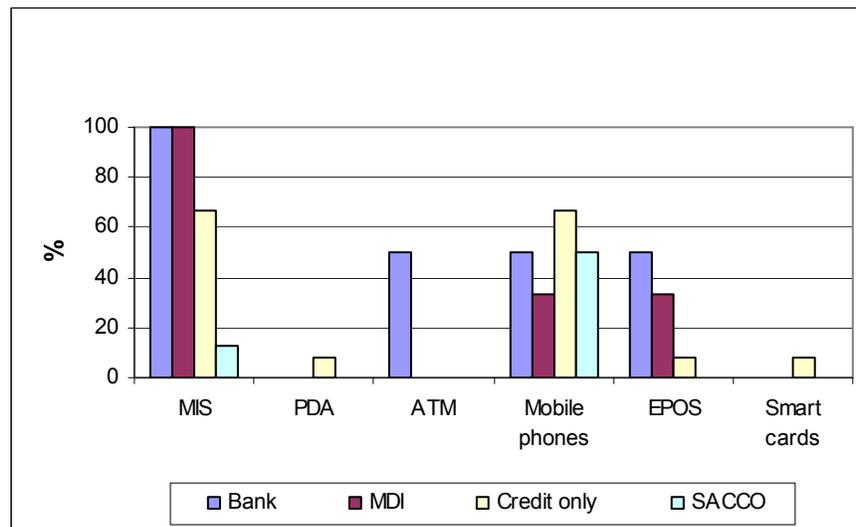
Information Technology Usage

Figure 2: IT Usage

Gibson and Meehan (2002) assert that the use of ICT especially the Management Information System (MIS) by MFIs improves efficiency and increases outreach at a lower cost to the people. The technologies support different functions, and in the process improve staff productivity and lower the operating costs. Figure 2 depicts how IT, specifically technology platforms, were being used by the MFIs. All banks and MDIs had Management information systems, while only 67% and 13% Credit only MFIs and SACCOs respectively had MIS. 8 percent of Credit only MFIs were using PDA, while the other institutions were not using them. The ATMs were being used by only banks. Mobile phones were equally utilised in all MFIs, though mostly in Credit only MFIs and less in MDIs. The Electronic Point of Sale systems (EPOS) were used in banks (50%), MDIs (33%) and Credit only MFIs (8%). 8 percent of Credit only MFIs were using PDA and Smart Cards to record client transactions, while none of the other institutions were using them. The PDA and Smart Cards have an advantage of improving data accuracy, operational efficiency and staff productivity especially in rural based transactions. They are a substitute for the manual paper based methods. Rural based MFIs have not yet realised the benefits associated with these tools.

Despite the fact that IT diffusion has been there for a long time, its usage is still minimal in most MFIs. While the large MFIs understand the role of MIS in storing critical data and managing the information, the smaller MFIs are still lagging due to limited technical capacity and resources to understand, adopt and invest in MIS solutions. Similarly, they have failed to embrace other technologies. These findings are similar to other developing countries such as India (Turaga, 2004).

Internet Connectivity Technology

There are several Internet connectivity technologies, though each one of them has advantages and disadvantages. MFIs which are in a strong financial position are more likely to use a combination of the various technologies with respect to their resources and operating processes.

Figure 3 depicts the various connectivity technologies for the Internet. The banks were using the Integrated Services Digital Network (ISDN) and leased line, while the MDIs were using only the leased line. The majority of Credit only MFIs were using dialup connection, and only 18% and 9 % were using wireless and leased line respectively. Sixty seven percent of the SACCOs were using wireless and only 33 percent were using the dialup connection. The dialup technology is still popular despite its inefficiency in terms of connectivity speed. This is brought about due to the relative reduction in Internet connection costs, which is about US$60 per month, and the Internet being used mainly for e-mail communication, whereby speed is not a critical prerequisite.
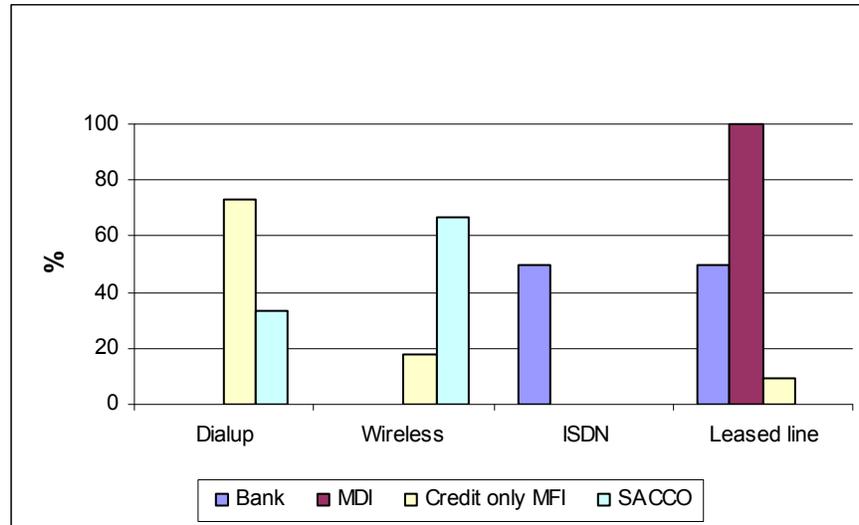

Figure 3: Type of Internet connectivity technology

Computer Infrastructure

The biggest challenge for most MFIs to provide low cost services to the people is the infrastructure owing to the required high level of investment in terms of hardware, software and human resources. Figure 4 depicts the various types of computer infrastructure in MFIs. All the banks had only a wide area network, while 67 percent of the MDIs had a wide area network and 33 percent a local area network. As for Credit only MFIs, only 17 percent had a wide area network, 75 percent a local area network and only 8 percent stand alone computers. More than 50 percent of the SACCOs had only one computer, with 33 percent using individual computers, and only 17 percent using local area networks. As expected, the investment in ICT by SACCOs is minimal due to their low capital base, and lack of appreciation of the benefits of ICT to their performance. The Banks and MDIs had IT department and well qualified personnel to administer and maintain the infrastructure.
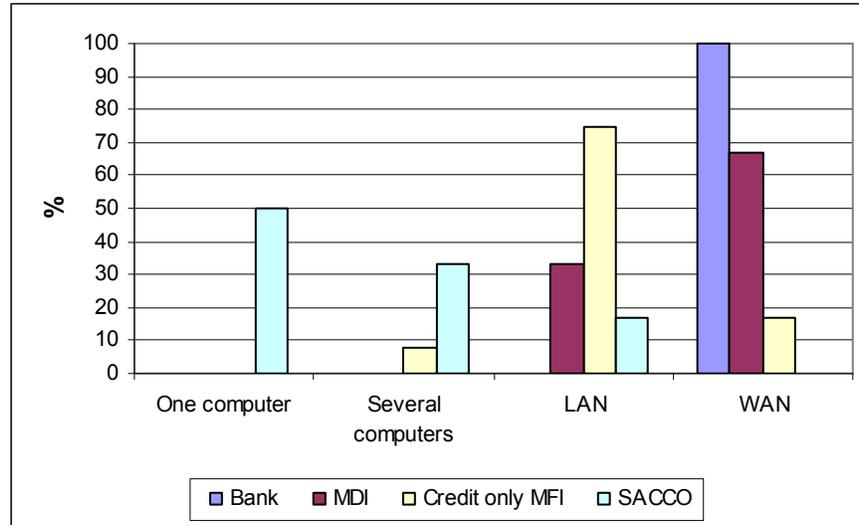
Figure 4: Computer Infrastructure

Internet Usage

Institutions have varying usage for the Internet, and this is usually determined by their core values and activities. Figure 5 depicts Internet usage by type of MFIs, where the heights of the bars indicate the percentage of responses. And the different bands in the bar indicate the different usage of the Internet. Banks use the Internet mainly for searching information (25%), research (25%), marketing (25%); and very little for communication (13%) and training (12%). The MDIs and Credit only MFIs use the Internet mainly for communication (42%), followed by searching for information (29%) and research (29%); while the SACCOs use it mainly for communication (40%) and searching for information (40%). MFIs have various usages for the Internet; the findings suggest that the large MFIs had a greater need information and research, so as to compete favourably in the industry. Similarly, communication plays a big part in the usage of the Internet in almost all MFIs.
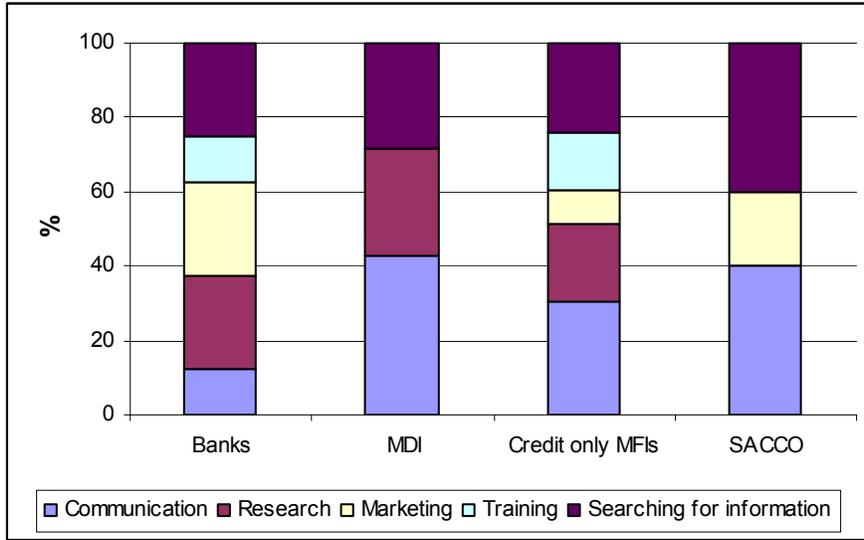
Figure 5: Usage of the Internet

Usage of Websites
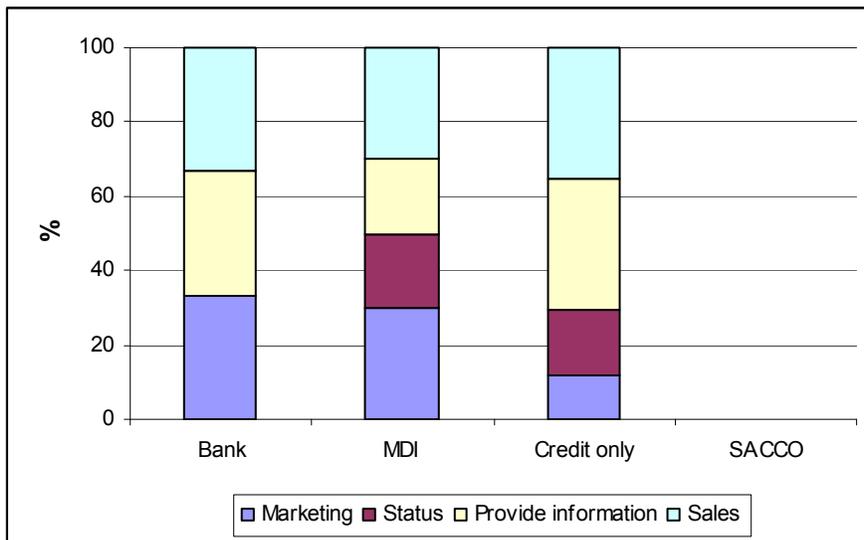
Figure 6: Usage of Websites

The web is changing the way institutions are doing business. Some institutions will embrace the web technology very seriously, while others will take it lightly due to lack of appreciation of its benefits. Figure 6 depicts the usage of website by different MFIs. The height of the bars indicates the percentage of responses. The different bands in the bar indicate the different website usage. The banks were using their web presence on the internet for marketing (33%), sales (33%) and to provide information (33%) and not for status, while the MDIs were using them mainly for marketing (30%) and sales (30%), but at the same time some of them were using them for

status(20%) and to provide information (20%) to a lesser extent. The Credit only institutions were using the web presence for sales (35%) and to provide information (35%) and less for status (18%) and marketing (12%). The SACCOs had no web presence due to the various barriers to ICT and Internet usage. The trend is not different from other studies (Chapman et al., 2000; Ssewanyana and Busler, 2007) where business size is a major characteristic in determining technology usage.

The development of websites was mainly by website consultancy firms, and some MFIs were using their own staff. For updating the information, most MFIs were using their own staff rather than contracted firms or individuals. Very few MFIs were using independent consultants to develop and update their websites. This is one way of minimising costs, as development and updating websites are not core activities for MFIs. On hosting the website, they were hosted by third party. When it comes to frequency of updating website information, 30 percent of MFIs with websites do not update their information, arguably suggesting that the websites have no value contribution to the performance of the MFIs, other than perceived status and reputation. Another 30 percent were updating the information at least once a quarter, and 20 percent every month and 10 percent every week, an indication that some MFIs understand the importance of regularly updating websites.

Level of Education of Decision Maker

The MFIs are led by people with different educational qualifications. The MFIs were headed by 48 percent graduates; 35 percent with postgraduate qualifications and 17 percent with a college qualification. The Banks and MDIs were headed by people with postgraduate qualifications. The SACCOs had 75 graduates and 25 college qualification. The results suggest that a large MFIs requires the top decision maker to be of higher degree qualifications so as to address the various challenges in the industry. ICT adoption and usage is largely in MFIs with highly educated decision makers, which is in line with Caselli and Coleman (2001) and Martin and Matlay (2000) that ICT usage is associated with high levels of human capital; and ICT spending is positively correlated with average years of schooling (Pohjola, 2003). This is illustrated in Table 4, with the exception of graduates who were heading institutions that were in existence for less than 5 years and had Internet for less than 3 years in the Credit only MFIs and SACCOs.

Internet Usage Duration	Level of Education		
	Post-graduate	Graduate	College
< 3 years	12	75	13
3 -5 years	67	33	-
> 5 years	72	14	14

Table 4: Internet Usage Duration and Decision Maker Education Level (%)

ICT Training to Staff

With respect to ICT training in MFI, Figure 7 depicts that training is not given prominence, as 34% never provide training to their staff, while 48% provide training once a year, 13% provide it 2 to 5 times a year and only 4% provide it more than 5 times a year, and these are Credit only MFI. Proper usage of ICT being a crucial factor in performance, the limited ICT training to the staff may have a negative impact to the performance of these MFI, and may result into underperformance of the employees. The findings are also suggestive that the large MFIs fail to invest much in ICT training. Many employers have not realised the positive association between training and productivity or organizational performance. Many studies have confirmed this relationship and Maglen, Hopkins and Burke (2001) cites Lyau and Pucel (1995) who carried out a survey of over two hundred Taiwanese automotive parts manufacturers where for every $28 spent on training a worker there was an average return of $430 to the organisation.
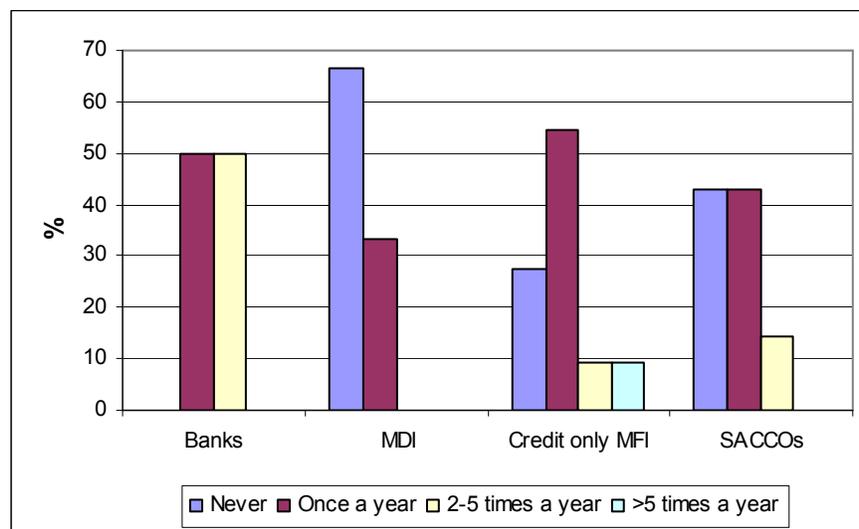

Figure 7: ICT Training

ICT Contribution to MFIs

With respect to ICT contribution to MFIs, Figure 8 depicts the different perceptions where the height of the bars indicate the proportion of responses, and the different bands provide the rankings from strongly agree to strongly disagree. The MFIs strongly agreed that ICT will contribute to increased efficiency (61%), improved service delivery (52%), improved operational efficiency (48%), increased savings (35%), improved market performance (24%) and low transaction costs (23%). Other MFIs agreed on improved market performance (62%), low transaction costs (55%), improved operational efficiency (52%), improved service delivery (48%) increased efficiency (39%) and increased savings (22%). There were 26% and 18% who were undecided whether ICT increase savings and contribute to low transaction costs respectively. Some MFIs disagreed that ICT increased efficiency (17%), improved market performance (10%) and lowered transaction costs (10%). These MFIs, that disagreed, were mainly SACCOs due to their size, the short duration they had used ICT, and limited application of ICT in their operations. The contribution of ICT to MFIs performance can be noted from the above.
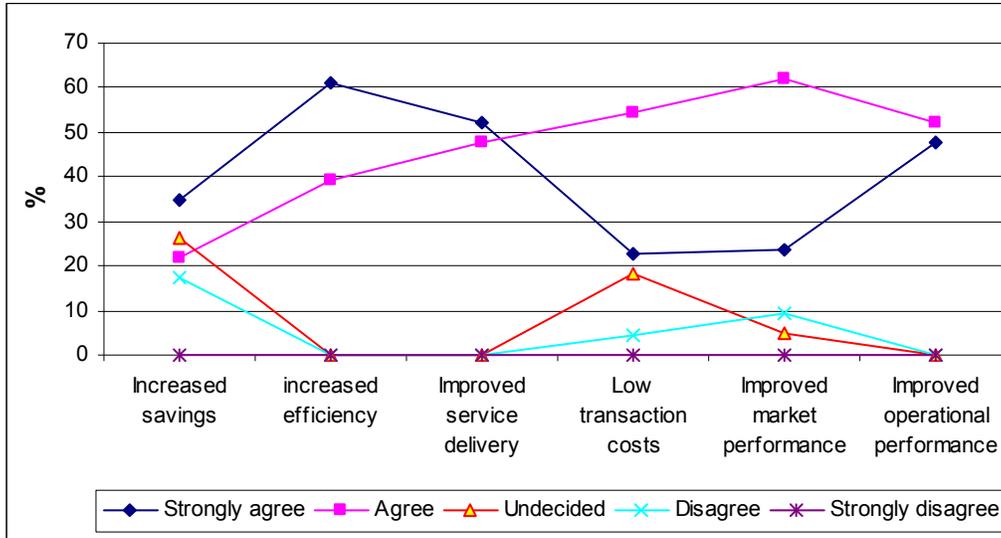
Figure 8: ICT contribution to MFI

Barriers to Computer and Internet Usage
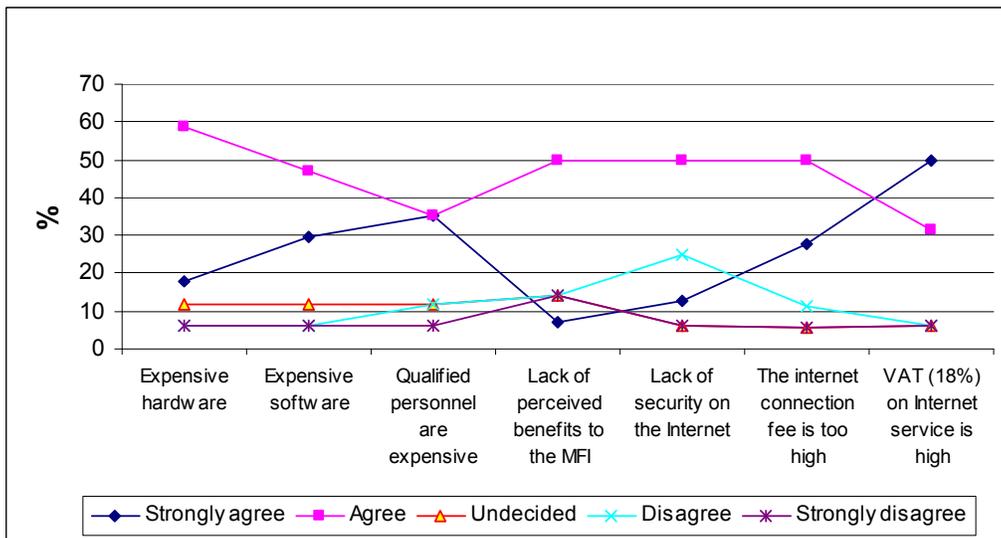
Figure 9: Barriers to ICT usage

With respect to barriers to computer and Internet usage, Figure 9 depicts the different perceptions where the height of the bars indicate the proportion of responses, and the different bands provide the rankings from strongly agree to strongly disagree. The respondents strongly agreed the barriers to computer and Internet usage as VAT (18%) on Internet service is high (50%), qualified personnel are expensive (35%), expensive software (29%), the Internet connection fee is too high (28%), expensive hardware (18%), and lack of security on the Internet (13%). Some agreed on expensive hardware (59%), lack of perceived benefits to the MFI (50%), lack of security on the Internet (50%), the Internet connection fee is to high (50%), expensive software (47%), and qualified personnel are expensive (35%). The major barriers are mainly

VAT on the Internet service and which also raised the Internet connection fee; the expensive software and hardware; and the qualified personnel who are expensive, making it difficult for MFIs to have permanent staff to take care of the ICT facilities. There are variations in perceptions due to the nature and size of MFIs, given that some MFIs have limited infrastructure and application usage. The barriers to ICT usage other than lack of perceived benefits to the MFIs are almost similar to what has been stated by Kotelnikov (2007), that include legal framework, financing options, human capacity and infrastructure.

MFIs have been identified as the best avenue to address poverty through provision of financial services at minimum costs to the poor people, but they are faced with high operational costs. Investment in ICT and utilising it efficiently lowers the transaction costs. Despite, the limitation of the sample size, the results indicate that MFIs have used ICT for many years. Some MFIs have had computers and the Internet for more than five years, though the extent of usage is still very low. The usage of ICT is more in large MFIs than in the small ones which is consistent with Martin and Matlay (2001) that small firms are less likely to have the necessary human and financial resources to acquire, develop and support ICT and related activities.

Different applications and technologies have been adopted to control costs, create efficiency and effectiveness in the operations, improve productivity and increase outreach; which eventually improve performance of the MFI. The large MFIs are mainly using proprietary software, while the small ones are using off-the-shelves products or free and open source software. This is in contrast with another CGAP (2005) study that found the majority of the MFIs using customized software. The use of free and open source software (FOSS) applications is catching-up in some MFIs, and the Mifos software is one of the most commonly used application. Over the years, MFIs have migrated from single or several computer systems to networked systems as they grow in size and expand their outreach. Simple technologies such as PDA, EPOS and Smart Cards have been adopted as one way of serving many clients at a lower cost especially in remote rural areas.

The MFIs have realised the various benefits offered by ICT that are similar to those identified by Hishigsuren (2006). Many of the MFIs have acquired different technologies. The MIS has been adopted by many MFIs, implying that the MFIs acknowledge the benefits associated with MIS that include improvement in the quality of information management, shortening the decision making process, and quick analysis on clients, operations and products that were identified by Hishigsuren (2006). In spite of the impressive usage of ICT, there are still barriers that need to be addressed, and most importantly the VAT (18%) on Internet related services hinders the acquisition of the Internet especially by the SACCOs. The high cost of employing qualified ICT personnel, who are needed to provide support, training and maintenance of the infrastructure in the institutions, is also a key challenge. The lack of perceived benefit of ICTs to the MFIs is still a strong barrier to ICT usage, and this may have a strong negative influence to ICT usage (Chapman et al, 2000). Some of the identified barriers to ICT usage such as the limited institutional capacity and the human resources who are not readily available to support the ICT solutions among many others are similar to those identified in Tanzania (Nielinger, 2003). Despite the barriers, there has been diffusion of ICTs in MFIsin Uganda. Addressing the barriers requires developing progressive policies that encourage MFIs to use ICT such as elimination of VAT on Internet related services, and other equipments that are not currently tax exempt.

Conclusion

This paper has attempted to establish the extent to which ICT has been used in MFIs in Uganda, and to set a benchmark that can be used for further research and comparison between countries or regions in developing countries. The usage of information technology, Internet, ICT infrastructure, websites, computer technology, in addition to Internet connectivity technology, ICT training, level of education of the decision maker, ICT contribution to MFIs and barriers to computer and Internet usage were examined across the MFIs. The ICT usage has been growing, different applications and technologies have been adopted by some MFIs to control costs, create efficiency and effectiveness in their operations, improve productivity, and increase outreach to the poor. Some MFIs are appreciating the benefits associated with ICT and in particular increased efficiency, improved service delivery, improved operational performance among many others. There has been barriers to ICT usage such as high costs of qualified personnel, high value added tax, and high costs of ICT equipments and services that must brought to the attention of the practitioners and policy makers for action so that ICT may continue influencing positively the MFIs' operations. The research has provided a benchmark that can be used for further research in developing countries.

The capacity to manage technologies is a key in the usage of ICTs in MFIs (Martin and Matlay, 2001). The supply of qualified people in ICT remains small, and the reason for the high labour costs. As a result many MFIs cannot engage full time qualified ICT personnel. This affects the extent of ICT usage in MFIs. There is need for policy makers to develop policies that will increase the number of qualified ICT personnel, such as encouraging many institutions to start ICT related courses, and tertiary institutions working hand-in- hand with MFIs and other stakeholders to develop an ICT curriculum that provide appropriate ICT skills relevant to the industry and meet the current and future needs of the MFIs. The increase in the number of qualified people in ICT will influence the labour costs. The government can achieve this through provision of grants and tax waivers to enable institutions to invest in ICT related activities.

FOSS has the potential of addressing the computing needs of MFIs at a very low cost. The usage of ICT has been hampered by the high costs of well marketed proprietary software and lack of awareness among practitioners that FOSS applications are good alternatives that can provide similar solutions. FOSS has benefits that range from the ability to lower transaction and maintenance costs to the support of a free secure ICT environment on computer servers. Governments and donors must be encouraged to support the software development activities and in particular the capacity development of skilled labour in FOSS applications, and thereafter encourage MFIs to adopt FOSS applications in their operations. Donors and governments must promote awareness campaigns on the benefits associated with ICT and in particular FOSS for the success of MFIs.

Further research is necessary as the findings were based on a relatively small sample that may have influenced the nature of results that were obtained. There is need to expand on the sample size and carry out similar research in other countries. The descriptive analysis that was used is always not sufficient to draw conclusions on a phenomenon, and to provide adequate information that can be used for policy development. Further research focusing on inferential analysis is necessary to study the relationships between ICT and MFIs, ICT usage in MFIs with a focus on

age, size and location of MFIs, ICT adoption in MFIs, and appropriate technologies and ICT solutions that are feasible for MFIs to meet the dual objectives of sustainability and outreach in developing countries.

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APPENDIX A: SURVEY ON ICT AND MICROFINANCE

Instructions: Please **fill, circle or tick** as appropriate.

Section 1: General Information on ICT

q. 101. Name of the business:…………………………

q.102. Which year was the firm established? …………..

q. 103. Location (village/District): …………………………………

q. 105. Type of business
       1. Bank   ………   2. MDI…… 3. Non-MDI ……….   4. SACCO ………..

Section 2: Computer Usage
q.201 Do you have computers? 1. Yes   2. No (skip to q.501)

q. 202. Employees and computer usage

Department	Number of employees	If yes to q201, state number of employees with access to computer, else skip to q301	List 3 major computer uses in order of importance (see codes below)		
(1)	(2)	(3)	(4)	(5)	(6)
			Rank 1	Rank 2	Rank 3
1. Administration					
2. Finance					
3. Operation					
4. Marketing/sales					
5. Support staff					

Codes for col. 4-6: 1.Word processing 2. Spreadsheets 3. Administration 4. Communication 5.Operation 6. Data management 7. Accounting 8. Pricing 9. Electronic bank transactions 10. Internet 11. Information processing

q. 203. How long has the Institution been using computers?
    1. Less than 3 years 2. 3-5 years 3. more than 5 years

q. 204. What is the composition of the computer infrastructure?
    1. One computer   2. Several independent computers
    3. Local area networked computers (LAN)   4. Networked computers linked to external networks (Extranet)

q.205 What kind of software application do you use?

   1. Proprietary software   (1) Windows   (2) Bank realm   (3)
others
   2. Free and open source software (FOSS)   (1) Linux   (2) Mifos   (3) others

Specify others: ………………………………………………………………………….

q. 206. How much do you spend on the above software purchases per year?
   1. Less than US$500   2. US$ 500 – 1,000
   3. US$1,000 – 2,500   4. Above US$ 2,500

q. 207. Which of the following ICT technologies do you use in your operations?
   (1) Management Information System (MIS)   (2) Personal Digital Assistant (PDA)
   (3) Automatic Teller Machine (ATM)   (4) Mobile phones
   (5) Electronic Point of Sale (EPOS)   (6) Smart cards

q.208. How much investment is in your ICT infrastructure (Asset value)
shs ……… ……………….

Section 3: IT Department
q.301 Do you have an IT Department? 1. Yes 2. No (skip to q. 414)

q. 302 Computer related personnel

Category	High skilled ICT professional	Computer Associate professional	Low skill ICT professional
Number of employees			
Average pay per month			

Note: a) High skilled ICT professionals (Degree) such as Programmers, System Administrators etc.
   b) Computer Associate professionals (Diploma) such as computer operators, electronic technicians etc.
   c) Low skill ICT professionals (Certificate) such Data processors, Data clerks, equipment repairers etc.

Section 4: Internet Usage
q.401. Do you have access to the Internet? 1. Yes 2. No [skip to q. 409)

q. 402 Number of employees with access to the Internet…………………………

q. 403. How long have you had the Internet?
   1. Less than 3 years 2. 3 -5 years 3. More than 5 years

q. 404. Which connection technology do you use for the Internet?

  (1) Dial-up (2) wireless (3) ISDN (4) leased line

q. 405   How much do you spend on the Internet per month? ……………

q. 406. How many computers are connected to the Internet? …………..

q. 407. What is the usage(s) of the Internet in your organization?
      (1) Communication (2) Research (3) Marketing (4) Training (5) Looking for information

q. 408. Does your company have a web-presence (web site) on the Internet? 1.Yes 2.No [skip to 415]

q. 409. Who hosts your web site? (1) own web site   (2) third party website

q.410. Who developed your website?
      (1) own staff   (2) contracted individuals   (3) contracted firms

q.411. Who updates the website information?
      (1) own staff   (2) contracted individuals   (3) contracted firms

q.412. How often is the website information updated?
      (1) Frequently – every week (2) Once a month   (3) Once every quarter
      (4) Once every 6 months   (5) Once a year   (6) Never

q.413.. What do you use the web site for?
      (1) Marketing (2) Status (3) To provide information (4) Sales (e-commerce)

q. 414. If no, please indicate to what extent you agree with the following on the barriers of computer and Internet usage in your firm

Barriers	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. Expensive hardware					
2. Expensive software					
3. Qualified personnel are expensive					
4. Lack of perceived benefits to the firm					
5. Lack of security on the Internet					
6. The Internet connection fee is too high					
7. VAT (18%) on Internet service is high					

q.415. How often do your staff receive ICT training?
      (1) Once a year   (2) 2 -5 times a year   (3) More than 5 times a year   (4) Never

Section 5: **ICT and MFI Performance**

q.501. Highest level of education of the Major decision maker
     (1) Post-graduate (2) Graduate (3) College (4) Secondary (5) Primary

q.502. Financial performance 2006/2007

	2006	2007	2006/07
Net operating income			
Total Assets			
Total uity			

q.503. Please indicate the extent to which you agree with the contribution of ICT to your organization.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. Increased savings					
2. Increased efficiency					
3. Improved service delivery					
3. Low transaction costs					
4. Improved market performance					
5. Improved operational performance					