

ICT FOR BUSINESS SERVICES: THE CASE OF UGANDAN MICROFINANCE INSTITUTIONS

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ABSTRACT

In this research we investigated the extent to which Microfinance Institutions (MFIs) use ICT to deliver business services and train staff. We performed literature review on ICT for business service delivery and staff skills development in MFIs. We next investigated the actual ICT usage by MFIs in Uganda with focus on ICT literacy, business applications, and planning. We used questionnaires to gather data from Microfinance institutions covering three districts of Uganda. The data collected from the survey was analyzed quantitatively and qualitatively. The analysis results indicate that the usage of ICT in microfinance business is still low. The usage is fair in business process automation but none in professional skills enhancement through e-learning. Based on our findings from this research we conclude that there is need to experiment e-learning for professional skills development in Ugandan microfinance institutions. Furthermore, research is needed to test the level of computer technology acceptance in microfinance business.

Keywords: *Microfinance institutions, Information and communication technology, e-learning, business service delivery*

1. INTRODUCTION

Microfinance institutions (MFIs) are institutions that provide financial services to poor and low-income households (and their microenterprises), allowing them to better manage their risks, achieve consistent consumption patterns, and develop an economic base. Decades of experience have demonstrated that the poor are not only creative with micro-loans (loans as small as \$50), but willing to repay as well. According to UNDP reports, despite the growth of microfinance industry, only 3% to 6% of the estimated global potential of 500 million poor households had been reached [1].

Microfinance loans tend to have high interest rates in order to recover the high costs of loan administration. Information and communication technologies (ICT) can allow MFIs to lower the cost of loan administration, and thus, offer more affordable and flexible loan products to clients. In addition, ICT can also help MFIs to expand their service coverage by providing logical, strategic and analytical support [1].

Association for Microfinance Institutions of Uganda (AMFIU) acknowledged that there is need to support capacity building and computerization for sound microfinance institutions (MFIs) such that they have systems to control costs and establish efficient branch management, that is, growth potential [2].

In the Philippines the introduction of basic banking software product enabled administrative costs of rural bank operations to be lowered by 60%. This was accompanied by faster services, better control of fraud, improved records and management reports. It is estimated that microfinance institutions with more than 1000 clients/members are sufficiently large to make computerization of operations an economic proposition [2].

Information Technology (IT) plays an increasingly important role in facilitating the introduction of new products or services, in improving operational services, and in guiding managerial decision-making. Therefore, mismanagement of IT can be detrimental to the competitive effectiveness of enterprises. Effective management of IT is particularly critical for small and medium enterprises (SMEs) because they operate different from large enterprises [3]. A Microfinance institution, as an SME, can only realize economic benefit from computerization if it manages its IT resources effectively.

Effective ICT utilization, appropriate applications, and individually tailored solutions can create opportunities and thus ICT can play a substantial role to address a number of goals in the development agenda. In an attempt to identify sectors that are likely to be responsive to technological change and promise high return on investment, small and medium enterprises have materialized as one potential target sector to harness ICT for development.

Information technology solutions are not currently meeting microfinance institution needs with only 34% of African microfinance managers happy with their microfinance information systems. Many reasons were cited for it, including an inability for microfinance institutions to clearly articulate what their business goals and needs are, and to make IT decisions in support of those goals. Many microfinance institutions treat IT as an add-on and consider it as something the systems administrator should deal with [4].

The unwillingness of microfinance institutions who have successfully introduced new technologies to share with others is another challenge facing microfinance industry in developing countries.

In order for microfinance institutions in Uganda to effectively utilize and manage IT there is need for them to overcome the above challenges. The paper presents ICT uses and management in microfinance institutions. Chapter 2 gives ICT utilization by microfinance institutions in other countries and ICT benefits researchers have presented for microfinance institutions. Chapter 3 is presentation of research methodology, chapter 4 presents the results of analyzed questionnaire using quantitative and qualitative approaches followed by SWOT analysis and a general framework for ICT adoption, use and management for microfinance institutions. Finally, chapter 5 is summary and conclusion of the research.

1.1 Structure of Uganda's Financial/Banking sector

The Ugandan financial sector comprises four tiers (see table 1). Tiers 1, 2 and 3 are licensed; these are directly supervised and regulated by Bank of Uganda to ensure the security of Public savings and confidence in the financial system, i.e. prudential regulation. Tier 4 MFIs are not allowed to collect savings. There are however two exceptions:

- Co-operative MFIs: Savings and Credit Co-operative societies (SACCOs) registered with the co-operative registrar are allowed to collect savings from and on-lend them to their members.
- Compulsory savings: All MFIs are allowed to collect savings as part of their lending methodology as a kind of collateral for loans [5].

Structure of Uganda's Financial/Banking sector			
Tier	Institution	Number	Law
Tier 1	Commercial Banks	15	Financial Institutions Act (FIA) 2004
Tier 2	Credit Institutions	7	FIA 2004
Tier 3	Microfinance Deposit-taking institutions (MDIs)	3	MDI Act 2003
Tier 4	Microfinance institutions including: NGOs, SACCOs, Companies, FSA, etc.	>1000	Not regulated by Bank of Uganda, registered under various bodies, e.g. NGO registration board, Registrar of cooperatives, Companies registry

Source: [5]

1.2 Problem statement

Microfinance institutions (MFIs) emerged in the last decade mainly to offer financial services to low income people especially in rural areas of Uganda. Many MFIs use ICT internally to support their business operations and externally to deliver financial services to clients. From literature review, the researcher discovered that no comprehensive research has been carried to find out the level at which these institutions use ICT for business service delivery and training. The effectiveness of ICT management in microfinance institutions remains unknown. ICT implementation in key functional areas such as procurement and commerce is still minimal or lacking and enough research has not been done on how ICT is utilized in business and commerce.

1.3 Purpose of the Study

The purpose of this research was twofold: First was investigating the extent to which microfinance institutions use ICT for business services in Uganda, and second to investigate the use of computer-based training (e-learning) in these institutions.

1.4 Research Questions

- a) How do microfinance institutions manage information technology in order to get competitive effectiveness of enterprises?
- b) What opportunities can information technology bring to microfinance institutions in Uganda?
- c) Research Question three: What are the existing information technology platforms (hardware and software) and skills that support microfinance business operations in Uganda?
- d) What ICT services do microfinance institutions use for business transactions and communication?

1.5 Theoretical Framework

This study was guided by IT hierarchy services needed by IT-enabled business models [6], [7]. This IT hierarchy theory was chosen for investigation of ICT in microfinance institutions because it examined IT management, IT-

based service delivery, and platform of information technology in an organization. The following are the nine components of IT hierarchy:

- 1) **Applications infrastructure:** An application is a software program that resides on a computer for the purpose of translating electronic input into meaningful form. Applications management includes purchasing software, developing proprietary applications, modifying applications, providing installation and technical support, and other tasks related to ensuring that applications are meeting the needs of the organization.
- 2) **Communications:** Technology that facilitates digital communication both within the organization and with the outside world is relevant here. It includes the management of hardware and software to facilitate communication via computer, telephone, facsimile, pagers, mobile phones, and other communication and messaging services. It includes the cabling and any other communication linkages required to create an effective communications network, in addition to the necessary hardware and applications to meet the needs of the organization.
- 3) **Data management:** This refers to the way the organization structures and handles its information resources. Data may be sourced from internal or external databases. Data management includes data collection, database design, sorting and reporting information, creating links to external databases, assuring data compatibility, and other activities surrounding the effective management of electronic information.
- 4) **IT management:** Information technology management includes many of the professional and strategic activities of the information technology group including negotiation, IS planning, project management, and other tasks. IS project management is defined as the coordination and control of all of the activities required to complete an information systems project.
- 5) **Security:** To protect data, equipment, and processing time, organizations restrict access to certain data and protect data and applications from manipulation and contamination. Recovery refers to the need for a plan to maintain computer operations and information should a disaster occur.
- 6) **Architecture and standards:** Information technology architecture is a set of policies and rules that govern the use of information technology and plot a migration path to the way business will be done in the future. In most firms it provides technical guidelines rather than rules for decision-making. Architecture has to cope with both business uncertainty and technological change, making it one of the most difficult tasks for a firm. A good architecture evolves over time and is documented and accessible to all managers in the firm. Each architecture decision needs a sound business base to encourage voluntary agreement and compliance across the business. A standard is a detailed definition of the technical choices to implement architecture. Five elements of architectures and standards are important: data, technology, communications, applications, and work. It can be distinguished between specifying architecture or standards and enforcement.
- 7) **Channel management:** New and emerging technologies allow direct connections or distribution channels to customers.
- 8) **IT research and development:** The information systems market develops rapidly, particularly with the rise of new e-business technologies. It is thus necessary to continually test applications and hardware to assist with planning decisions. IT research and development includes identifying and testing new technologies for business purposes and evaluating proposals for new information systems initiatives.
- 9) **IT education:** Training and education in the use of IT can be defined as formal classes, individual training, and technology-based self-training programs for users ensuring hands-on computer proficiency levels meeting corporate requirements. IS management education can be defined as education aimed at senior levels in the firm designed to generate value from IT use.

2. REVIEW OF RELATED LITERATURE IN MICROFINANCE ICT

2.1 State-of-art of ICT use in Microfinance in developing countries

2.1.1 Managing Information

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. As a result, more people can have better, faster access to more relevant information [4].

The enhanced ability to collect, organize and analyze information helps institutions to better understand their customers, their costs, and their options.

They use this information to:

- make better decisions about strategy, objectives and priorities;
- monitor and test performance;
- learn from the methodologies and techniques being applied by the institution; and
- make timely adjustments.

2.1.2 Improving Outreach

The efficiencies gained through better information management and the redesign of products and services frees up resources for MFIs to use elsewhere [4]. They can pass the efficiency benefits onto clients through lower prices, which would make their services more affordable to poorer customers. They can open new offices or access points to reach a larger number of customers or geographic regions. Alternatively, they can use the freed up resources to develop new products or new delivery mechanisms that enable the institution to serve people or places that it could not serve before.

Indeed, in addition to freeing up resources, information technology can be part of an MFI's outreach solution. Whereas the cost of delivering financial services in rural areas may have previously been prohibitive, IT may make it affordable. It can do this in four ways:

- a) **By increasing staff productivity.** Improved information systems, credit scoring, battery operated hand-held computers and other technologies can make it possible for individual employees to serve more customers and for managers to either supervise more staff or improve the quality of supervision and support provided to existing staff. As a result, the institution can achieve greater economies of scale and do so more quickly than before.
- b) **By reducing transaction costs.** Technologies such as wireless devices, electronic payment systems, and credit scoring can enable MFIs to complete transactions at a lower cost than before, thus making it possible for retail outlets or remote units to break-even faster.
- c) **By removing physical asset barriers to growth.** With technology, MFIs can create alternative delivery channels or delivery mechanisms that make it possible to reach clients without necessarily having to rely on brick and mortar infrastructure, i.e. on buildings and offices. This physical infrastructure is costly to acquire and maintain, and the significant investment required to create each individual access point typically restricts growth. Although capital investments are also required for IT infrastructure, those investments tend to be intense during initial design and installation, with much lower costs for adding individual access points. This facilitates growth and, again, greater economies of scale.
- d) **By increasing the range of access point options.** MFIs can choose from a growing number of options for reaching their customers, including ATMs, retail agents equipped with POS devices, Internet kiosks, etc. They can select the option or multiple options that can provide the best outreach for their particular needs at the lowest cost. MFIs can also choose whether to rent someone else's infrastructure or to build and own their own. By borrowing and building on the resources of others, their growth is less limited by their own internal human resource capacity and fixed asset budget. Together, the improved efficiency, lower costs, and higher productivity will enable MFIs to grow faster, further and deeper than was possible without IT.
- e) **Facilitating Integration** Technology can help find practical solutions to making partnerships work. On the one hand, it can help solve the technical problems of connecting different individuals and institutions, system compatibility, security, meeting regulatory requirements, and designing applications that enable the sharing of relevant, timely information. On the other hand, it can make the idea of integration more attractive. The proper application of mainstream IT solutions can increase confidence in a partner's ability to share information, lend credibility to the quality of data that will be shared, convey an image of organization, sophistication or a "cutting edge" approach to operations, and generate confidence in the partner's ability to manage risk. Both sides of the coin are important in enabling MFIs, and the microfinance industry in general, to forge the kind of partnerships that allow the design, delivery and financing of solutions which meet MFI objectives and facilitate the economic development of individuals, communities, and nations.

2.1.3 Microfinance technologies

A wide range of technologies are available to help microfinance providers improve efficiency, track operations more accurately, increase transparency and reach new customers [8]. Yet the majority of the microfinance institutions struggle to select the right technologies and get the most from their investments.

The following technologies are used in microfinance [8]:

- **Information systems (IS) technology** which helps microfinance institutions (MFIs) to track, analyze, and report on their operations. Small MFIs may manage with manual ledgers or spreadsheets, but most MFIs eventually need custom-built or commercially available IS software to track financial transactions and create reports for management, donors, and regulators. IS technology can also include handheld computers that record client information, scoring techniques that analyze data to predict customer behavior, and connectivity technologies that transmit data among staff and branches, such as broadband or VSAT (a wireless data connection via satellite).
- **Delivery technologies.** Large MFIs and banks sometimes use non-traditional delivery technologies, such as automated teller machines (ATMs), point-of-sale (POS) networks (devices in retail outlets which use

debit/credit cards to facilitate electronic payments and transactions), and mobile phone banking. These technologies allow customers to make payments, transfers, cash withdrawals, and cash deposits outside branch offices. Although new delivery technologies have the potential to reduce the cost of serving the poor, in many countries they have not yet proven as cost-effective as more conventional operations.

Technology can benefit microfinance service providers in the following ways [8]:

- **More informed decisions.** An IS that produces timely, accurate data enables managers to continually evaluate performance, better predict cash needs, and anticipate and respond to crises rapidly. By upgrading its IS, Spandana (India) management was able to compile timely, reliable data and monitor performance across the MFIs 45-branch network.
- **Increased flexibility.** Cooperative 23 de Julio (Ecuador) transmits data instantaneously throughout its branch network using dial-up and VSAT connections, which are faster and cheaper than physically transferring data, and allows customers to bank at any branch.
- **Lower operating costs.** Mibanco (Peru) reduced loan origination costs by 10 percent by streamlining its loan approval process with a scorecard to predict client repayment behavior.
- **Better reporting.** First Microfinance Bank (Pakistan) developed an IS that allowed managers to produce reliable, standardized reports which follow accounting industry and national standards.
- **Increased deposits.** By placing easy-to-use ATMs in well trafficked areas, Prodem (Bolivia) gave its clients the ability to save more often, and in smaller amounts, when they had cash available.
- **Improved customer convenience.** Cerudeb (Uganda) is experimenting with POS devices that enable clients to use their bank cards to withdraw cash at local retail outlets, instead of waiting in line at the branch.
- **More rural customers.** Standard Bank's (South Africa) low minimum balance, easy-to-use "ePlan" account can be opened at manned ATMs in rural areas where it would be too expensive to open branches.

2.2 ICT for Microfinance accessibility

Management information system application software, the Smart Cards and personal digital assistants (PDAs) are some of the technologies that can facilitate microfinance business [1]. These technologies allow the loan officers to more efficiently serve their clients by reducing paper work, increasing accessibility to information and finally simplify computations of complex analyses. The above cutting-edge technologies that have been used by microfinance institutions are described as follows:

- Management information systems (MIS) – through well-defined MIS, MFIs can access or analyze information more efficiently for better decision-making, operations management, and product development. Some of the features expected from MIS include: access control and security (i.e. passwords, audit trails), loan functionality (processing different types of loans with changing repayment periods and interest rates), deposits functionality (including access for the user to the interest rates, fees and penalty charges), report generation and database query/analysis capacity (i.e. loans profile by gender and risk, credit scoring, etc)
- Smart Cards – are plastic in nature and similar in appearance to debit/credit cards. Smart cards have micro-chips embedded in them. The function of the micro-chip is to store data and this brings opportunity for MFIs to carry all their related loan and purchase information on a micro-chip. Therefore, a smart card can serve as a debit cards, an account passbook and even a credit card.
- Personal Digital Assistants (PDAs) – these are small portable handheld computers that can be used by loan officers to access the institution's MIS. The loan officer can use PDA to update information at the head office while still in the field.

2.3 Open-source software for microfinance business

Microbanks and credit cooperatives have sprung up all over the developing world, providing loan services to millions of poor people. Taking care of these businesses has become a big challenge for microbankers. The money in microfinance is constantly recycled. As money is repaid, usually within six months to one year, the money is recycled to another loan. Keeping track of thousands of clients with hundreds of thousands of ongoing transactions requires computers. The price of computer hardware has continued to fall down in the world in the recent years. The computer hardware is affordable, but the specialized software tools (MIS) are not. The MIS is expensive and the training and supports services to it in the developing world is too costly or unavailable [9].

Mifos software developed by Grameen foundation is open-source software designed to revolutionize the way that microfinance practitioners access and use technology to run their operations. This system was launched in Global microcredit summit in Canada on November 13, 2006, during that time IDRC announced its intention of extending Mifo to microfinance to African community of users and developers. Microfinance institutions have scarce resources to invest in the purchase, maintenance and upgrading of MIS systems. Mifos being open-source software

has reduced costs and can easily be adapted; anyone with right skills can modify the system to meet particular local needs and language requirements. This enables microfinance institutions to manage their own information systems with the help of local technicians. Mifos has same features and functionalities as its commercial counterparts. The features include client management, loan repayment tracking, fees, and savings transactions. The system is web-based with in-built security and support to different languages and currencies [9].

IDRC and the Grameen in principle agreed to have partnership with Adept systems, an IT consulting company in Nairobi, and the East African center for open source software (EACOSS) in Kampala, Uganda to encourage and support an Africa-wide community of mifos users and developers [9].

2.4 Distributed system for microfinance business

Around 45% of existing microfinance institutions still track and record their operations and accounting in Excel sheets or even completely manually. This is costly in terms of time and resources. This approach of information management leaves room for errors, prevents institutions from growing quickly, and undermines their ability to manage risks.

IBM has developed a microfinance processing hub, that is, a shared infrastructure and software platform that provides groups of MFIs with a centralized core banking system, data center, operations management, and transaction processing. This plan initially covered eleven countries and opened to all kinds of financial institutions. Connected institutions had slightly standardized their business processes and product features [10]. The following are the benefits MFIs can get from centralized IBM information system [10]:

- MFIs group themselves to better negotiate prices with different service providers;
- Investment fixed costs are turned into variable costs (e.g. cost per client per year, or by transaction);
- Internet connection is the only resource needed to open a branch, installation of hardware and software is not needed;
- New products can be added without difficulties in system adjustments;
- Portfolio, accounting, and client information is readily available for external and internal use improving the overall transparency of the industry;
- Local banks feel more comfortable to fund MFIs since reporting is transparent and readily available;
- Connecting with additional distribution channels like ATM networks, retail agent chains, is a “plug and play” issue.

2.5 Loan Performer software for Microfinance Business

Crystal Clear software limited is a registered computer company in Uganda. This company develops, markets and supports a microfinance software package called loan performer with primary purpose of tracking loans and savings. This software has been recognized by World Bank and UNDP as a good tool for managing microfinance business process. The key functionalities of loan performer include: client communications when in sending general messages, message after a savings deposit/withdrawal, message after a savings transfer, repayment due reminder message, arrears notice message to guarantor and loan/arrears balance messages. Other features of loan performer include: poverty assessment, bank reconciliation, loan refinancing, foreign exchange transactions, custom reports, SMS banking and Fingerprint scanning [11].

2.6 ICT for Human Resource Development in microfinance

2.6.1 Introduction

In the case of education sector more and more educational institutions have now realized the potential impact of using the Internet as part of the learning environment [12]. In spite of many difficulties that still remain open issues, the benefits of Internet-based learning have been widely recognized. Some of these major advantages include flexibility and broader accessibility [13], improved students' performance [14], reflective evaluation of the learning experience and higher computer self-efficacy [15]. Academic institutions get advantage of cost reductions and increasing revenues [16]. The success of using Internet-based technologies in learning is due to its potential of integrating various types of media such as sound, video, animation, graphics and text. These media can be delivered in various forms such as collaboration, interactive simulation, etc.

2.6.2 Education services to microfinance institutions in Uganda

Uganda has good establishment of training industry, which includes training to financial sector institutions. Several training institutions exist and a survey by GFA management in 2004 founded very small consulting services. Training budgets are small in financial institutions. In most cases managers take priority for trainings and the ground level staff whose performance is perceived by the majority of the clients are not trained. The underestimation of the loan officer might reflect a general cultural concept that is rather hierarchical and emphasizes top-down decision-

making. It is based on the misconception that loan officers just have to apply rules and obey orders, however, do not have to take responsibility for their actions. From experience it has been proved that when loan officers do a bad job (bad credit assessment and insufficient monitoring) the costs and problem with portfolio quality quickly multiply and overstrain management capacities. In such a situation it is insufficient to only train managers for providing better supervision and risk management instead of erasing problems where they are created [17]. Uganda Institute of Banking and Financial Services (UIBFS) is the sole provider of training and consulting services to financial institutions in the country. UIBFS offers professional courses in banking and microfinance at certificate and diploma levels. This institution also offers short term courses tailor-made to suit the needs of various banks and microfinance institutions in the country. UIBFS has its premises in the capital city Kampala and five distance learning centers situated at each region of the country. The training approach used by the institute is conventional face-to-face sessions of routine lectures for regular students and workbooks for distance learning students. At present there is no e-learning platform for training financial institutions staff in the country. Introducing e-learning in financial services sector in general and microfinance institutions in particular can bring a number of benefits to the staff and the institutions.

2.6.3 E-learning for microfinance in other countries

Here we present a number of organizations that initiated distance learning practices in microfinance institutions. They are namely: PlaNet Finance and exchange LCC.

CDs were used for content, video clips and audio narrative to train loan officers of microfinance institutions in Arab world [18]. The advantages of such ICT based training include: increase in productivity and efficiency of loan officers who represent 70% of staff in microfinance industry; building of stronger human resources leading to successful and sustainable microfinance operations; reduced costs in training participants with travel and accommodation expenses being reduced compared with traditional classroom training.

2.6.4 Exchange LCC

In collaboration with the InterAmerican Development Bank, the firm exchange LCC based in the USA piloted new distance learning technologies designed to improve junior and middle level staff training in Latin America. The program was named “Harnessing the Power of Technology to Improve Staff Training”. The exchange LCC distance learning approach to training staff encourages self-initiated learning, which was a missed practical tool in Latin American microfinance and microenterprise organizations. It allowed for human interaction, real-life experimentation, critical thinking and reflection from a computer terminal, a phone or a television. This consulting firm tested the level that distance learning technologies are able to improve access to learning opportunities and performance of middle and junior staff in microfinance institutions [19].

2.6.5 PlaNet Finance

PlaNet Finance is an international non-profit organization based in France. In 1999, PlaNet Finance initiated an e-learning platform called PlaNet University. The online training platform offered a new, free training system which was setup with the evolution of IT. The PlaNet University has set up a training curriculum in microfinance. The objective was to make the set modules of that curriculum available online. All existing modules were available online in French and English. The training catalogue was made up of the standard contents, which were adapted to a diverse and open audience. From that perspective, the different themes addressed were based on the techniques recognized and used by the microfinance sector. The training programs were designed in collaboration with the consultants and microfinance practitioners. PlaNet University offered two ways of training namely: Self-paced training where the learner followed the modules in an autonomous way according to his availability. The most adapted training content was information, simple concepts and procedures. The second approach was tutored training. The tutored training enhanced learners’ understanding and reduced the feeling of loneliness and isolation. Online tutoring built relationship between the participants and the trainer and that improved learning approach. The tutor received questions from learners and he would reply using e-mail or chat tools. Between the years 2000 and 2006, more than 3,000 participants enrolled at the online training platform (PlaNet University). Most of the trainees were microfinance institution (MFI) staff from Africa, Asia and Latin America. Other participants who enrolled for the training were university students and consultants [19].

2.7 Challenges in implementing a distance learning model in microfinance industry

2.7.1 Initial Investment in e-learning technology for microfinance

PlaNet Finance and exchange LCC were pioneers in using e-learning platform for microfinance industry. The two organizations received support from donors and private companies to design an appropriate e-learning environment for microfinance institutions. Building a learning management system requires heavy investment of time, resources

and staff to build, operate and maintain such systems. In microfinance industry, in most cases a staff is overloaded with work and it is difficult to travel from one place to another in the case of developing countries. Training of staff through traditional classroom sessions can be both expensive and ineffective. Face-to-face training offers limited time to acquire new knowledge and skills. E-learning when properly designed and implemented can offer training opportunities where participants can interact with the trainer online or with fellow students through discussion forum. The continued fall in computer hardware price and the rapid diffusion of Internet from urban to rural areas in developing countries brings new opportunity in e-learning for the rural poor. The majority of microfinance institutions operate in rural areas and they have opportunity to use e-learning for professional competence building. There are a number of good e-learning open source software tools that microfinance institutions can use at no cost to implement e-learning for training their staff [19].

2.7.2 Innovative training methodologies

One of the training methodologies is called blended approach which combines online and face-to-face training. This approach was used for middle Russian and Polish middle staff from microfinance institutions by PlaNet Finance and MFC projects. The blended approach was used to capture three important training outcomes namely:

- *Knowledge acquisition.* Online training was considered ideal for acquiring new ideas and sharing information. The effectiveness of online approach for knowledge acquisition was rated 100%.
- *Skills development.* For skills building online approach was rated at 50% or less in terms of its contribution since supervision and direct instruction by face-to-face sessions is more effective in skills development.
- *Behavior modification.* Online approach contributed 25% or less. Change of attitudes of learners required experienced instructors to change work habits.

A productive blended learning should be designed to include online instructions, mentoring, discussion forum, multimedia content, and video conferencing using webcam and online resources for a learner to access during his or her free time.

3. RESEARCH METHODOLOGY

3.1 Research design

The cross-sectional survey research design was used to generate data. This is because with such a design it is easy to collect data in a short period of time from many respondents [20]. It also allows generalization to be made about the characteristics, opinions, beliefs, attitudes and practices of the entire population being studied. Besides this, this method was found to save both time and money without sacrificing efficiency, and accuracy in the research process. Administering questionnaires, documentary study and observation were the techniques by which this method was applied.

3.2 Selection of Microfinance Institutions

The study focused on selected microfinance institutions from the three districts. A total of 10 microfinance institutions were purposively selected, on average 3 from each district. Some near the district headquarter and others far from it.

3.3 Population of the study

The population size was 60 employees of 10 microfinance institutions. The subjects for survey included: the managers of microfinance institutions, the management information officers, the IT managers, and financial managers or chief accountants, loan officers and data entrants. These were selected because they have reliable information about IT services and management in microfinance institutions.

3.4 Research Instruments

3.4.1 Questionnaires

Since the study was descriptive type of design, the questionnaire was selected as the best instrument for collecting data. This was because the subjects of the study were senior staff in microfinance institutions that are educated and can easily understand questionnaire and give appropriate responses. It also saved time which is limited, since it was easy to administer to a large population and to score. In addition to this, it simplified the task of categorizing, tabulating and summarizing responses. Open-ended questions were included to allow the respondents a chance to express and clarify their views.

3.4.2 Observation of the Microfinance activities

The researcher employed direct observation to gather data, which could not be reliably obtained through questionnaires. This was highly rewarding because the researcher made physical visits to the microfinance

institutions purposively sampled to observe the activities taking place in the institutions like conditions of IT facilities, office automation, and quality of service offered to the customers in terms of time. `

3.5 Procedure for Data collection

Questionnaires were distributed personally by the researcher to the microfinance institutions concerned in the study. This helped in minimizing wastage of questionnaires and loss of time.

3.6 Data Analysis

Parts of the questionnaires were analyzed quantitatively using the statistical package for social scientists (SPSS) for Microsoft Windows. Open-ended questions were qualitatively analyzed using coding method. The overall analysis commenced by coding and categorization of information. The description was done on the basis of tabulated frequencies and percentages. Inferential statistics was used to compare ICT services in two districts of Uganda. The findings were presented according to the themes of the research questions.

3.7 Validity

Validity describes the extent to which the research instrument is tapping the information it is meant to measure in terms of content [20]. The questionnaire for this research was developed based on the objectives of the study. A pilot survey was carried out. The content validity index (cvi) was calculated and was found to be 0.83. This value reflected the validity of the instruments.

4. PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

This section is presentation of results to the following research questions.

- 1) **Research Question one:** How do microfinance institutions manage their information technology in order to get competitive effectiveness of enterprises?
- 2) **Research Question two:** What opportunities can information technology bring to microfinance institutions in Uganda?
- 3) **Research Question three:** What are the existing information technology platforms (hardware and software) and skills that support microfinance business operations in Uganda?
- 4) **Research Question four:** What ICT services do microfinance institutions use for business transactions and communication?

4.1.1 Research Question one: How can microfinance institutions manage their information technology in order to get competitive effectiveness of enterprises?

We investigated ICT investment in the context of planning, software acquisition and human resource development. A total of 60 staff members were asked to respond to the multiple-response questions. In the areas of ICT investment, most of microfinance institutions purchase new computers to replace old ones (67%), some upgrade Internet connectivity to improve on Internet services (50%), while web sites are improved and software projects are implemented each at level of 47%. Few have ICT strategies for their organizations (35%). Next, analyzing the data for human resource development, training of staff of microfinance institutions in ICT skills is mostly done by the ICT manager of the institutions (65%). Some of the institutions outsource training services (35%). Finally for software acquisition by microfinance institutions, this item in the questionnaire was answered by 41 respondents out of 60 with 47% using outsourcing approach for software acquisition and only 22% having in-house software development.

4.1.2 Research Question two: What opportunities can information technology bring to microfinance institutions in Uganda?

The opportunities ICT can bring to microfinance industry in Uganda are outlined in the opportunity section of the SWOT analysis table shown in section 4.5. The opportunities originate from literature review of the ICT practices in microfinance industry in other countries.

4.1.3 Research Question three: What are the existing information technology platforms (hardware and software) and skills that support microfinance business operations in Uganda?

To answer the above question, we investigated a number of variables that include: computer technologies, computer applications, level of ICT literacy among microfinance staff, use of ICT applications for service delivery to the microfinance clients. We obtained the following results after administering questionnaire to 60 microfinance staff members:

The dominant technologies used are Internet (80%) and E-mail (75%). The least used technologies are Linux/open source software (10%) and virtual private network (7%).

We notice that most of the microfinance institutions use web sites to provide information about their organizations (73%) with some using web for marketing purposes (57%). Only few use web sites for online communication (15%). Here it is evident that most of the web sites are static offering information without dynamic aspect that can promote communication. When asked for the average number of clients a microfinance institution in a microfinance institution, the dominant range is *more than 1000* (72.9%). This means computerization is feasible exercise for these institutions. Most of these institutions (76.7%) have branches spread throughout the country. We next investigated the level of ICT literacy among the microfinance staff. The results indicate that 25.4% of the staff was computer illiterate and 62.5% had little ICT knowledge.

This implies that most clients of microfinance institutions have low level of computer literacy and can hardly use ICT in business environment. We further investigated ICT literacy by finding the level of knowledge of Microsoft office applications among the microfinance staff. Here we noted that the majority of the employees (61.7%) have very good skills in using Microsoft word, they also had good skills in Microsoft excel, with 41.7% good and 56.7% very good. In the case of using database software (Microsoft Access), only 33.9% of the staff was knowledgeable. We notice the level of skills dropping from Microsoft Word, Microsoft Excel and Microsoft Access respectively.

4.1.4 Research Question four: What ICT services do microfinance institutions use for business transactions and communication?

The answer research question four, we investigated the use of ICT tools for support of business transactions and communication, most of the microfinance staff (68.3%) responded that ICT is critical for them to deliver services internally and externally to the clients. However, the remaining (31.7%) expressed that ICT doesn't play important role to drive business process. We see that much as the majorities are using ICT to support business process, there is still reasonable gap (31.7%) for those who do not have access to ICT tools to facilitate business process.

Our next investigation was the availability and use of Internet services by Microfinance institutions. In particular we investigated the availability of websites, email use, and provision of online services to external clients. The responses we got from the questionnaires indicate that the majority of them (86.4%) have web sites and few (13.6%) do not have web sites for access to the public. For Internet use, only few (7.7%) are not knowledgeable in Internet. The majority (61.5%) is very good at using Internet and some of the staffs (30.8%) are also good Internet users, with 62.7% having very good email skills, and 35.3% having good email skills.

Regarding ATM service provision, our survey results show that the majority of the staff (52.5%) acknowledged not having ATM services for their clients and the (47.5%) claimed to be providing ATM services to their clients. The majority of the customers (83.9%) do not use ATMs for loan repayment. Finally regarding online loan information and online loan applications, the majority do not provide loan information on their websites (66%) and some use websites (34%) to provide loan information to their clients.

4.2 Qualitative data analysis

The open-ended questions were qualitatively analyzed with the results presented in the tables below. The responses were grouped according to themes.

Table 3: ICT utilization in microfinance institutions

No	Service Category	Activities
1	Loan processing	Loan processing, loan portfolio status-tracking, credit appraisal, loan appraisal, loan disbursement, storage of security information, loan recovery services, loan databases, study of credit history of applicants
2	Office automation	Data capture and processing. E.g. Loan application processing, use of Microsoft office tools such as Ms Word, Ms Excel, Ms Access and Ms PowerPoint
3	Banking services	Daily transactions (deposits and withdrawals), money transfer , e.g. western union, account updates
4	Communication services	E-mail communication, Wide Area Network communication, Internet research and provision of product information
5	Management services	Report generation, digital data storage backup and management and creation of centralized database for all the branches

The table below presents summary of challenges experienced by microfinance institutions in using ICT for as a tool for facilitating business processes.

Table 4: Challenges facing ICT utilization in microfinance institutions in Uganda

No	ICT services	Challenges
1	Internet services	Insufficient bandwidth resulting in slow Internet access, restriction of Internet services to few employees of the organization, limitation of Internet services to only few hours of the day, and lack of interactive web site services for communication among staff and external customers.
2	Computer network services	Lack of networking services between the head office and branches, inconsistent computer network services, lack of physical infrastructure for computer networks and inadequate network services, available network doesn't provide practical services.
3	Online microfinance services	Lack of mobile banking services, no online access to microfinance products and services, absence of ATM services for loan repayment and unavailable online loan forms
4	Computer hardware equipment and software services	Computer hardware equipment and software used to support business services is old and outdated, availability of computer equipment is restricted to few staff, the available computer have low processor speeds, the software update is not regular, there is high demand for tailor-made loan tracking software and irregular computer equipment maintenance services
5	Human resource development	Need to train all staff in ICT literacy and need to update ICT staff in latest computer technology

4.3 SWOT Analysis

In chapter2 I presented the ways in which ICT has contributed to microfinance business in many developing countries. Chapter 3 presents how microfinance institutions use ICT in Uganda and the problems they face with ICT incorporation into their business processes. Next is presentation of the SWOT analysis to identify areas of strength, weaknesses, opportunities and threats in ICT for microfinance business process.

<p>Strengths</p> <ul style="list-style-type: none"> • The microfinance institutions use ICT to process data • ICT –based Money transfer. • The management has strong commitment to ICT enabled business • The staff are enthusiastic to use ICT • Access to remote communities • Information and organization of materials at one place (databases, accounting software, etc) • Anywhere, anytime, anyplace 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Specialists are needed to support ICT use for business expansion • Expensive (net connections, developing accounting software, hardware costs, etc) • Not everyone is eager to use new technology • Hardware/software problems • Usability and functionality problems • Lack of tailor- made software for local needs • Lack of technical support for maintenance • Microfinance institutions are not like giant banks that can invest a lot of money in ICT • Small Internet bandwidth for network services • Most clients who borrow money from microfinance institutions are computer illiterate
<p>Opportunities</p> <ul style="list-style-type: none"> • Chances to establish branchless banks • Mobile banking initiatives • ATM services for clients • Point of sales services • Save money and time • Combination of institutions to use distributed systems. • Low cost open-source software for MIS 	<p>Threats</p> <ul style="list-style-type: none"> • IT technology changes very fast • ICT can be prone to abuses if security is not sufficient – crackers, hackers, and viruses • The initial investment in ICT is normally high and the returns may not be immediate • Need for more developers and designers

5. ENVIRONMENT AND CONTEXT, TECHNOLOGY AND DEVELOPMENT IMPACT OF ICT IN MICROFINANCE INSTITUTIONS

In this section we present three important components for ICT adoption in microfinance institutions, namely: environment and context, technology, and development impact.

The first component, environment and context, presents the conditions under which technology can be suitably implemented in response to business problems. This factor also examines the context in which the technical solution is implemented in terms of language, attitude of users and sustainability.

The second component, technology, presents technological options feasible for microfinance business solutions. These include computer hardware and software technologies, network technologies, distributed systems, and telecommunications.

The third component is the development impact in which we present the various ICT solutions for improving internal and external microfinance services and business processes.

5.1 Environment and context

- 1) National ICT policy should support ICT utilization in MFIs
- 2) MFI staff should be trained to use ICT for networking
- 3) ICT training at workplace should be offered to all staff of MFI.
- 4) Special attention should be given to promote ICT use by MFI clients.
- 5) Software should be customized to accommodate local languages
- 6) ICT awareness creation
- 7) Provision of Government and non-governmental financial support for ICT in MFIs
- 8) Information and communication infrastructure development in rural areas where majority of microfinance institutions are located
- 9) Political environment should be conducive for business
- 10) International relationships should be fostered for MFI to make linkages and exchange best practices.

5.2 Technology

- 1) Internet and web technologies for communication and networking
- 2) Open source software applications for business process automation and e-learning.
- 3) Mobile devices (Laptops and PDAs) for loan officers' use in fields.
- 4) Wireless connectivity to ease Internet connectivity in a situation where landline telephone network is poor.
- 5) Technical skills to maintain computer hardware equipment and network settings
- 6) Networking skills for Internet and email use
- 7) Desktop computers, printers, scanners for document production
- 8) Point-of-sales networks
- 9) Mobile Phone banking in local languages
- 10) Distributed systems for connecting head office and branches
- 11) ATM networks for expanding branchless banks

5.3 Development impact

- 1) Web Portal for microfinance products advertisement
- 2) Financial system for microfinance business
- 3) Web portal for networking MFI personnel and donors
- 4) E-learning platforms to support MFI staff
- 5) E-commerce consortia for MFIs

5.4 Limitations of the study

The limitation of this study was the difficulty of administering questionnaires to the staff of financial institutions. Most institutions do not release data out for the fear that it may leak to their competitors. Most of the staffs were so busy that they could hardly spare any time to respond to questionnaires when given. Few institutions have the policy of the researcher paying them before the questionnaires can be administered. However, the institutions and the staff who accepted filling the questionnaires took more time than the expected one to return the filled questionnaires.

The researcher is certain to claim that the findings are a true overall reflection of the ICT services and management in microfinance institutions of Uganda. The institutions selected for this study were general representation of microfinance institutions in Uganda. We selected a mixture of institutions from city areas and distant upcountry areas.

6. SUMMARY AND CONCLUSION

Microfinance institutions use ICT at different levels for financial services provision. ICT has eased communication services, data processing services and report generation activities in some microfinance institutions. Survey results show that most MFIs have more than 1000 clients which makes computerization of business services a feasible exercise. Less than half of these institutions use ATMs to provide financial services to their clients. In most cases the management of an MFI acquires software for an institution using outsourcing approach. These institutions hardly use open source software tools for business automation. About 30% of the institutions we visited plan for their ICT strategy with the remaining 70% having no strategic plans for ICT use and management. ICT adds value to existing financial services when used constructively to support business data processing and communication. ICT brings new opportunities to microfinance institutions apart from office automation. From literature, we see ICT has been used in some countries to create branchless microfinance banks. In Uganda there is still problem with infrastructure to create branchless banks. With government plans of setting up communication infrastructure for e-government, microfinance business stands to benefit from shared infrastructure. There is need for the top management of MFIs to align their business strategies with IT strategies if they are to benefit from the available infrastructure provided by the government. This research focused on ICT for business services and staff skills development. We found that microfinance software has been developed by some computer companies to support business processes. We did not find the use of e-learning for staff skills enhancement in Uganda. We established few cases in Russia and Poland where e-learning was used for capacity building in microfinance banks. We recommend research in e-learning experimentation in MFIs in Uganda. There is also need to find out the level of acceptance of microfinance software that is currently used by institutions in Uganda.

7. REFERENCE

- [1]. P. Si, Increasing Access to Microfinance Using Information and Communications Technology, (2001).
- [2]. AMFIU, Association of Microfinance Institutions of Uganda, "Microfinance Interest rates – Four strong points for Policy Makers", The New Vision September, (2006).
- [3]. A. Montazemi, "How they manage IT: SMEs in Canada and U.S", *Communication of the ACM*, vol.49, No. 12 (2006).
- [4]. C. Frankiewicz, "Information Technology as a strategic tool for Microfinance in Africa", A seminar Report, April 26-27, Nairobi, Kenya (2003).
- [5]. C. Kilibo, *The Microfinance banker*. Vol. 5 Issue 3, (2005)
- [6]. P. Weill & M. R. Vitale, What IT infrastructure capabilities are needed to implement e-business models? *MIS Quarterly Executive*, 1(1), 17-34 (2002).
- [7]. P. G. Schalk, Business Dynamics in Information Technology, ISBN: 9781599044293, Idea Publishing Group (2007).
- [8]. G. Ivatury and N. Pasricha, Funding Microfinance Technology, CGAP, Donor Brief No. 23, April (2005).
- [9]. IDRC at the Global Microcredit Summit in Halifax. Retrieved from http://www.idrc.ca/en/ev-105782-201-1-DO_TOPIC.html
- [10]. Siedek, IBM hearts MFIs (2008). Retrieved from <http://technology.cgap.org/2008/02/05/ibm-hearts-mfis/>
- [11]. African News Dimension (AND), Ugandan Firm gets African ICT award (2005). Available at: <http://www.andnetwork.com/>
- [12]. G. S. Raafa, N. Fassil, and T. Weiwei, Viability of the "Technology Acceptance Model" in Multimedia Learning Environments: A Comparative Study. *Interdisciplinary Journal of Knowledge and Learning Objects*, Vol. 3.pp. 175-184 (2007).
- [13]. Lee, M. K. O., Cheung, C. M. K and Chen, Z, Acceptance of Internet-based learning medium: The role of extrinsic and intrinsic motivation. *Information & Management*, 42(8), 1095-1104 (2005).
- [14]. M. Alavi, Computer-mediated collaborative learning: An empirical evaluation. *MIS Quarterly*, 18(2), 159-174 (1994).
- [15]. G. Piccoli, R. Ahmad, and B. Ives, Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. *MIS Quarterly*, 25(4), 401 (2001).
- [16]. Saade, R., and Bahli, B, The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: An extension of technology acceptance model. *Information & Management*, 42(2), 261-386 (2005).
- [17]. GFA, Report on market and training needs assessment in Uganda, GTZ project, Hamburg, February (2004)
- [18]. Grameen, Microfinance e-learning course for Loan Officers. Grameen-Jameel Pan-Arab Microfinance Ltd (2009)
- [19]. D. Krumm, Open and Distance Learning in Microfinance. PlaNet Finance Morocco (2006).
- [20]. J. C. Enon, Educational Research, Statistics and Measurement, Department of Distance Education: Makerere University (1998).