

# TRANSFORMING MFIs

## MANAGEMENT INFORMATION SYSTEMS

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**Publishers:**

SPEED-USAID  
PCE I-00-99-00007-00  
18 Clement Hill Road  
P.O. Box 26013  
Kampala, Uganda

**Design and Printing:**

ACHA GRAPHICS  
P.O.Box 23363  
Kampala, Uganda  
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# Acknowledgements

Geraldine O’Keeffe would like to thank the Uganda Speed II project for its funding of this publication and to Joanna Ledgerwood for her contributions and support throughout the project. She is grateful to Uganda Microfinance Union for the opportunity to play a role in their transformation process. Thanks also to Joakim Vincze for his initial contributions to this piece of work and for his ongoing insight in the area of IT and microfinance. Finally, she thanks Victoria White for her support and infectious enthusiasm for microfinance.



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# Executive Summary

Institutional growth is the key driver for an MFI to undergo the challenging and intensive transformation process from an NGO to a regulated commercial institution. Through transformation additional sources of capital can be accessed to fund the growth and regulatory permission opens the door for deliver of more and different financial products, which provides the incentives required for growing the customer base. The transformation will require fundamental changes within a microfinance institution (MFI), both in its operations and organization. The Information Systems (IS) that exist within an MFI commonly must be adapted to facilitate these changes, supporting the new information requirements that arise as a result of transformation strategy without jeopardizing ongoing information needs. This paper is intended to assist managers through this sometimes quite tumultuous process to the end vision for their organization.

In order to identify the proper new system and successfully implement it within the timeframe of the transformation process it is imperative that MFI's formally manage this upgrade process as a project while adhering to good project management practices. The challenges of managing any project are numerous, but technology projects add an extra layer of complexity due to high expectations of the technology, the breadth of stakeholders that are touched by the system, and the linked timeframes with the overall transformation strategy. Hence it is vital to have a change management plan as part of the MIS project plan to help people prepare for and make the need changes in operational practices.

The key element for keeping any project on time and schedule is having thoroughly defined specifications early in the project. This however requires that management has already clearly defined their business goals and strategy, down to measurable objectives. These are the tools that drive the process forward, without them it is impossible to move forward successfully. As part of the strategic thinking process, it is important to also include a review of all the newest technologies to understand the opportunities and challenges they offer. With a proper MIS task team in place, an agreed methodology for moving through this process, and a well-articulated mandate, the MFI is ready to begin the MIS process.

Critical to managing the process is identifying project dependencies. Risks and responsibilities should also be analyzed and included in the project plan submitted to the transformation committee. Strong planning coupled with good leadership and communication will help keep the project on track, and involving people in the process and providing sufficient training for new roles and responsibilities is necessary to build buy-in through the project.

Significant capital investment in equipment, hardware and technical assistance will be required to successfully identify, choose and take up a new MIS application. Therefore it is strongly advised that the MFI choose the solution that will bring them the greatest return in the long-term not just for meeting immediate regulatory requirements, but also for fulfilling current and emerging customer demands. In addition, MFIs need to make sure they have (or will have) sufficient resources to support this initiative.

Transformation places new demands on the MIS in terms of its ability to centralize information from different operating locations. Regulatory reporting requirements and liquidity management requires Head Office to be aware of the position and performance of their branches with greater frequency and reliability. In terms of MIS software specifications flexibility and scalability of the system are the two most important features for transformation. With sufficient parameterization and robustness the MIS solution should be able to meet all the needs of the organization even over time as it grows. Particularly for the new system it must be able to support various new savings products, comply with Central Bank regulatory reporting requirements and accounting treatment, support teller services (if not already available) and support greater demands for

portfolio analysis. Scalability is required to accommodate the growth of the MFI going forward, in particular the capacity of a system to expand, supporting greater diversity of financial products, a high volume of users, interoperability with delivery channel solutions and increased information processing without jeopardizing performance.

From experience in Uganda, many lessons were gained, most notably the importance to ensure all senior management own and lead the decision-making process surrounding the management of upgrading the MIS, and the need to establish clear requirements for the MIS pre- and post transformation. Software modifications should not be initiated until the Central Bank has finalised their guidelines. A careful and thorough mapping of all the activities, resources and timeline required for the MIS project enables close alignment with all other transformation activities. Including sufficient contingency planning for external suppliers and developers is a must. And finally, keeping an eye toward new technologies that can be leveraged either today or in the near future, in particular telecommunication alternatives, is advised, given the advances being made.

# 1. Introduction

Transformation from an NGO to a regulated commercial institution will require fundamental changes within a microfinance institution (MFI), both in its operations and organization. The Information Systems (IS) that exist within an MFI must be adapted to facilitate these changes, supporting the new information requirements that arise as a result of transformation without jeopardizing ongoing information needs. This paper provides practitioners with insight to how the transformation process impacts an organization's IS, identifying both direct and indirect changes that may be necessary to support the transformation process. Given the variety of systems and operating environments that exist it is impossible to precisely predict the necessary changes that will be required for all institutions. Instead this paper will highlight the experience of MFI's in Uganda to illustrate general IS challenges that may arise. It is also intended to provide guidance through the process of an MIS upgrade for the transforming institution, sparking thought and consideration of issues, rather than direct answers or solutions. To this end questions are posed in a summary format at the end of each section, and should be addressed by those responsible for MIS transformation, where applicable.

For the purpose of this paper, the components of transformation that are considered to most directly affect an organizations IS are defined as: the introduction of new savings products, compliance with the Bank of Uganda (BoU) in terms of reporting and accounting treatment, support for teller services if not already available, and greater demands for portfolio analysis. Systems must possess the flexibility to address each of these issues as well as be scalable to accommodate the growth of the MFI going forward. For this purpose we define scalability as the capacity of a system to expand, supporting a diversity of financial products, a high volume of users, and increased information processing, all without jeopardizing performance.

Before beginning, it is worthwhile to clarify the terminology used when discussing IS for microfinance. The common reference of Management Information Systems (MIS) implies that these are systems used only by management for their decision-making purposes. In reality these systems encompass almost all levels of the organization, from loans officers to senior management, each with their own information needs. So although the term IS more accurately reflects the true nature of MFI systems we will persist with the use of the term MIS so as not to cause confusion. An additional point of clarification refers to the use of technology within a system. An IS involves much more than just computers- it includes the people, policies and processes that govern the way information is collected processed, stored, analyzed and accessed. These systems may entail the significant use of technology or alternatively be entirely manual. For the purpose of this paper we assume that an MFI undergoing transformation will be employing a computer based information system (CBIS) for some or all of its information needs. However those employing a manual system should also benefit from many of the topics discussed as the information requirements remain the same regardless of the use of technology.

Lastly, this paper does not seek to repeat information currently available on MIS for microfinance such as the Microfinance handbook by Waterfield and Ramsing (1998), CGAP ISS<sup>1</sup> resources and software selection framework by Mainhart (1999) or other guides and evaluations available through CGAP's Information Systems Services website (2001). Such resources are invaluable to any MFI considering implementing an MIS for the first time and provide much valuable background information regarding some of the topics discussed within this paper.

<sup>1</sup>Available from [http://www.cgap.org/iss\\_site/](http://www.cgap.org/iss_site/)

## **2. Planning for an MIS Upgrade**

### **2.1 MIS Project Management**

Preparing a MIS to meet the needs of transformation should be treated as a formal IS project that adheres to the basic principles of IS project management. This includes a formalized planning stage in which the project is broken down into manageable activities that can then be planned and accurately estimated. The output of this planning stage should be a project plan, complete with task breakdown, resource estimation budgeting for employee level of effort, external technical assistance and technology along with allocation of responsibilities. Although the working environments of MFIs may find this approach somewhat time consuming, clearly setting up the project will help save significant amounts of time, money and effort in the longer term.

To help ensure proper leadership, attention and institutional acceptance of the results, it is advised that the MFI create an IT Task Force to guide this project. The project team should include a senior level manager responsible for the team, representative managers from all the key business units, the IT manager, as well as a representative sample of the general users. This team/committee will oversee and be directly involved in the MIS upgrade process. Most likely given the size of the MFIs transforming, this committee will be a subset of the Transformation Committee plus others since the two initiatives need to be well coordinated.

Project analysis and planning is by far the most critical phase in the MIS upgrade process as failure to identify an activity or requirement may ultimately delay or even prevent transformation. The skills required to carry out this analysis may be beyond those available in a purely technical IT department and in some cases could be well suited to an external consultant who has both an understanding of the regulations and business environments as well as information systems as a whole. Regardless of who carries out the analysis their findings should be verified with the IT Task Force and the Transformation Committee to ensure that they have correctly interpreted the requirements and are clear on the objectives of the project. The rest of this paper will assist with the identification of activities to include within a MIS upgrade however, suffice to say each MFI will have different requirements based on their specific environments.

### **2.2 MIS Upgrade Process**

Following a standard approach to managing the MIS upgrade process is critical to overall success. The four core phases include: needs assessment; design; research and selection; and finally implementation. In the initial phase, an assessment of current and future information needs must be done, which results in a requirements document. This is best completed by conducting interviews with the users department by department, and from a sample of branch operations staff. The more people involved in the requirements collection phase the less likely the IT task force will miss a requirement and the more likely employees will buy-in to the new system. Second is the design phase in which the IT task team visions the “what” of the solution and assigns priorities to the requirements. The end output to this phase is a specifications document which is used in the next phase to research technology options. The research and selection phase is usually completed in two iterations. First, a high level scan is done of all the available options with some basic research to narrow the options down to a short list of three. It is ideal to have three viable options. Having more is fine, but the amount of due diligence done at this stage is significant so having more than three options can be quite burdensome. Once the short list of applications has been identified, each vendor should be requested to do an on-site visit and demonstration followed by the submission of a proposal in response to a request for proposal (RFP) given to each vendor outlining the necessary requirements. Once the proposals are received they will need to be evaluated and rated according to the

priorities and resource criteria set outlined by the IT Task Force. Leveraging an external consultant for this phase can be quite useful and valuable as this is a particular expertise. Further, this exercise can be funded by the CGAP IS Fund (see CGAP website). The end goal of this phase is to select the software application to use and have a negotiated contract with the vendor.

The final phase of the process is the implementation, which involves hardware acquisition, network and connectivity setup, software installation, testing, training, data migration, process alignment, and going-live. This culminates with a system evaluation to ensure optimization of the technology. This phase can take anywhere from two to 12 months depending on the size of the institution and the type of approach taken for the conversion to the new system. In general from start to finish the MIS upgrade process will usually take a full 12 to 18 months.

Given the length of time required it is imperative that the Transformation Committee work closely with the IT Task Force to properly align and sequence activities so as not to put the transformation process and regulatory approval at risk. In addition, it is imperative that the visioning activity for the MIS upgrade project involves all the key thinkers of the organization and be appropriately timed ok transformation process. While not all the specifics for new products will be known this early on, the high-level attributes will suffice for the requirements definition.

### **2.3 Strategic Thinking**

Institutional growth is a key driver for an MFI to undergo a transformation process. Through transformation, additional sources of capital can be accessed to fund the growth and regulatory permission opens the door to deliver more and different financial products, which provides the ability for growing the customer base. Hence it is critical when identifying the requirements for the new information system that the organization not be too narrowly focused on the immediate term needs, mainly compliance with regulatory reporting to determine the best application. Significant capital investment in equipment, hardware and technical assistance will be required to successfully take up the new applications. Therefore it is strongly advised that the MFI choose the solution that will bring them the greatest return in the long-term (five to seven years). As part of the transformation process it is presumed that strategic thinking has been carried out to determine both the near-term and long-term vision for the organization. As part of that session or in a subsequent session, the MFI should clearly articulate the business goals of the organization taking into consideration client demands and available technology innovations. To prepare for this, part of the session should identify opportunities and challenges of accessing and using technologies locally. While it is common and encouraged to explore how the use of these technologies may look for the organization as part of the visioning activity, the MFI should articulate the vision in terms of the “what” (e.g. branchless banking) and not the “how” (e.g. smart cards, connectivity, or a PoS network). The ‘how’ will be determined later in the process based on priorities, availability of technology, viability, and resources.

The second key output of a strategic thinking exercise is a criteria set for evaluating the technology options. This will vary in length, characteristics and priority by institution to institution, but in general includes some of the following elements—customer driven, extendable, usable, reliable, secure, and affordable. It is imperative that the IT Task Force and/or the Transformation Committee come to agreement on these priorities BEFORE beginning the due diligence of the different technology options. Otherwise, waiting later in the process will slow it down and the evaluators will be mesmerized by the bells and whistles of the technology. Since this is a critical step in the process and requires a special set of skills, it is advisable that the organization use a third-party to lead the strategic thinking session. If the chosen facilitator is not an expert in technology, then the IT manager should prepare summary of the technology landscape for the given country or region to use during the session.

## 2.4 MIS Requirements Definition

Planning for MIS upgrade requires clear identification of the input, processing, output and communication requirements for the MIS post transformation. Involving external as well as internal users in the requirements definition is critical to ensure a complete set of specifications early on and buy-in from the various stakeholder groups. Unclear requirements is the number one reasons IS projects go over budget and timelines. Changes late in the process impact all levels—technology, processes, budgeting, training, and rollout. The sources of these requirements should include external stakeholders such as the Central Bank regulatory body and investors, as well as internal stakeholders such as the Transformation Committee. All departments affected by transformation, senior management and operational users of the current MIS should be represented. Consultations with each of these sources should provide the scope of the project including an overview of issues along with the specific detailed requirements of the information system for the newly transformed organization. A sample set of requirements and the common source are shown in Table 1.

**Table 1: Requirements and Sources**

Source	Requirement identified
BoU regulations	Role of MIS during application procedure e.g. documented BoU policies and procedures, MIS audit Regulatory reporting requirements Accounting and loan processing regulations
Transformation	Timeframe for transformation
Committee	Estimates of business growth Details of new products and changes to existing products
Senior Management	IT vision and strategy Resources available for MIS transformation
System users	User requirements for upgrade/new system

Based on the high level requirements identified a set of MIS project tasks should be determined. For example the requirement to meet compliance reporting requirements will necessitate a series of activities regarding communication alternatives and ensuring that the required information is available. It is important to prioritize requirements according to whether they are immediate requirements or long-term changes necessary to support transformation. Project dependencies, risks and responsibilities should also be analyzed and included in the project plan submitted to the Transformation Committee.

## 2.5 Process Assessment

While it is not mandatory or even highly recommended to conduct a full scale reengineering effort of the core processes for the transformation effort, it is important to at least identify the processes that will be most directly impacted by the upgrade of the information system. Once identified, these processes can be assessed and re-designed, streamlined or eliminated as is appropriate with the new technology. It is important to remember that technology's greatest value added is not when it is laid over existing processes, but when business processes and practices are re-invented to take the most advantage of the technology. The new way of doing business should drive the choice of technology, which should in turn enable new operational practices.

Once the core process are identified, they should be classified accordingly—identity, priority, background, or mandated process. Each process should then be evaluated for its salience and worth to the institution as some processes simply are not worth the investment to improve them. Precious IT resources and transformation dollars should be focused directly on the processes with the most potential for improvement that will generate economic value (directly or indirectly) for the organization.<sup>2</sup> Otherwise, the capital is better spent elsewhere in the institution.

## 2.6 Software Selection

For those that have identified the need for a new MIS it is recommended that evaluation tools such as that provided by Mainhart (1999) be utilized to assess potential software applications. This framework breaks down an assessment of an MIS application into the following components; functionality and expandability, usability, reporting, standards and compliance, administration and support, technical specifications and correctness, and costs. Criteria are listed for each component and a system can be assessed according to how it meets this general criteria set and the specific priorities of the institution.

While all of these criteria listed within this framework should be considered in terms of relative importance for the implementing MFI, certain topics are of particular importance for those seeking to transform. These include the following:<sup>3</sup>

- Deposit account management- functionality and flexibility to support different savings and deposit products .
- Accounting - functionality to perform a full range of accounting activities and to meet required compliance standards, as well as improved asset, liquidity and deposit management.
- Loans- capability to monitor and manage the loan portfolio, particularly portfolio aging, in addition to greater flexibility with individual loan products and the decision making processes.
- Scalability of the system to support institutional growth—diverse new products as well as volume of users necessary for scaling the institution as it grows through transformation.
- Flexibility to incorporate new requirements—since transformation can open many new doors for the organization it is important to have a MIS that is parameterized enough to enable the organization to easily pursue new opportunities as they emerge.
- Report generation—greater control and ease for adjusting and generating reports especially for the regulatory authority.
- Governmental and supervisory adherence—proper audit capacities and security measures as well as full control of the chart of account to ensure institutional compliance.

Each of these is discussed in more detail when discussing the individual modules but suffice to say that it is imperative that MFIs clearly identify their requirements in these areas, and all other requirements, before they select an MIS solution. Pressure to transform should not compromise the time allocated to the process of software selection, contract negotiation and implementation. This is a major project that will benefit from laying down foundations to support the new system and ensuring that both business and technical needs are addressed by the chosen solution.

<sup>2</sup>Economic value is derived from a process when it generates more value than the cost of the capital it uses. The Process Edge, pgs 47 and 58.

<sup>3</sup>Adapted from Mainhart, 1999.

## 2.7 Change Management

An MFI cannot underestimate the need for having a change plan as part of the overall approach and implementation for both the MIS upgrade and the transformation to help ensure employees enthusiastically prepare for and take up the new system(s) and ways of doing business. Preparing and enabling employees to deal with change builds institutional change capital (the confidence and capability to complete future change successfully) and contributes to the project staying on schedule and budget. While the change plan may appear to be largely symbolic, acknowledging the natural tendency for most to resist change, it helps people break from the past and embrace the future opportunities.

While there are a number of factors that can be addressed when managing a change process, a few are articulated here for the internal project managers to use:

- Senior Management must lead the change and clearly articulate and communicate the rationale for change.
- Plan for change, assess impact on a broad set of stakeholders, and provide opportunities for letting go of the past and contributing to the creation of the future vision, the new way of operating.
- Emphasize ongoing communication about the changes and perceived usefulness; eliminate surprise, and clearly define new roles and responsibilities.
- Involve users in the change process, especially the requirements definition and beyond to create buy-in early in the process and build throughout it.
- Show links between an individual's current and future job and the new vision for the organization, thus contributing value and aligning expectations for employees.
- Create a positive learning environment for employees to safely learn new skills and responsibilities without fear of failure or losing opportunities in the new organization.
- Raise red flags early!! Deadlines, resources, budgets, technical capabilities.
- Managers must model the change for others and provide a safe learning environment for employees to be taught new skills and tasks.
- Expect resistance to change, look for ways to help employees move beyond their initial fears, break from the old ways, and help create the new way of operating (e.g. goal setting, praise, enjoyment, roles, rewards, conditions, procedures).

## 2.8 Critical Success Factors

For many MFIs that are accustomed to managing operations driven by daily routines and repetition, managing and participating in an IS project can be quite daunting. However, it is critical to the success of the effort that this type of initiative be organized and treated as a project. Even within that there are some areas of potential problems unique to managing information technology projects. Outlined here are the most important items for managers to remember. Keeping this list visible—posted on your desk or on the front the project notebook throughout the entire process is highly recommended. See Appendix 1 - Project Management Principles, for a visual display of what results when these principles are not adhered to.

Critical success factors for designing and managing IT initiatives:

- Technology choices should always further business objectives; must have very clear business goals that the institution understands and is committed to.
- Must establish clear goals of success with specific targets to measure results and quantify return on investment; otherwise employees get through the process and feel no sense of accomplishment and investors are not satisfied with results.

- The project must have a project champion, generally a high-level senior manager well respected, with the ability to sell the new vision. In a small organization this might be the General Manager or the Operations Manager.
- Must have internal MIS project manager who is keeping the project moving forward on time and schedule, following up with others to ensure work is completed.
- Must have a task team to do the work which is comprised of fair representation of the stakeholders across the organization; the project manager is responsible for leading this team.
- Must clearly define criteria set (requirements) for solution in the beginning; scope creep due to changes in requirements is the number one drive for projects going over-budget and beyond timelines.
- Must have senior management leadership, buy-in and accountability for outcomes, including business unit managers.
- Rationale for change must be clearly stated and communicated to all stakeholders.
- Adequate resources for not only the new software but for all the internal staff time, specialized technical assistance, training, hardware and other capital investments.
- Planning, planning, planning and even more contingency planning should be done to ensure the process meets designated milestones and remains in synch with the overall transformation process.
- Do not cut corners on training or change management activities, this will inevitable come back to drag the process down and cost project overruns. Investing in people is just as important, if not more, than investing in technology.

Finally, it is worth noting the challenges that are unique to IT initiatives, most notably everyone's high expectations of the technology. It is seen as being a panacea for all problems and when it doesn't deliver as promised or on time it causes morale issues. Aligning and managing expectations is therefore important throughout the entire process. Secondly, IT project management and analytical experience is difficult to come by for microfinance institutions, rare are the ones who have the full range of staff expertise in-house. Leveraging outside experts will be necessary along the way, so plan and allocate resources accordingly. Since technology touches everyone in an organization, including customers and the board in one way or another there is a complex web of stakeholders to manage, both their participation as required and expectations. As always, this type of IT project is likely to follow tight timeframes and budgets; therefore there is a need to manage activities and resources very, very closely.

## 3. Software Requirements

Regardless of whether current systems will be retained after transformation or a new MIS selected, certain issues must be addressed including loan portfolio management, savings/deposit management, accounting and reporting. Given different regulatory environments from one country to the next this is not an exhaustive list of issues relevant to all systems but rather should be used to stimulate ideas and help MFIs identify any potential weaknesses in their MIS.

### 3.1 System Design

The design of the overall information system must balance system security and privacy with access and flexibility. While this decision can be outlined by the IT Manager or consultant, it is ultimately the responsibility of senior management to determine the levels of risk the institution is willing to assume in able to provide greater customer service.

Further, there is a natural tension between customization at the department or branch level and the need for institutional wide information standards to ensure continuity and efficiency of services to customers. Too much or too little flexibility between these levels generally results in poor communications, chaos and a variant quality of responses. For example, a customer in one branch having to provide different information for a loan than in another branch is not appropriate. On the other hand a loan officer may need to be able to offer different terms (within reason) for a loan product in order to respond to customer needs and general market demands. Technology can help create the necessary consistency and control across the organization and yet also provide significant flexibility. Setting some loan product parameters at the global or product level, but allowing others to be defined at the individual account level by the loan officer is one example of how system design can meet the needs of the MFI. Another is setting the security features of an MIS to restrict changes to the chart of accounts at the branch level. While the IT manager or consultant can lay out all the data standard and business policies that need to be considered, it is ultimately senior management's responsibility to decide which elements are institutional standards and which are defined at the department/branch level.

Finally, it is important that business needs should always drive the technology choices, generally software capabilities first and hardware requirements as related. However there are exceptions to this order of thinking. Hence the importance of having clear business objectives agreed to at the onset of the transformation strategy so that a clear vision of the necessary IT design can be created to support those objectives in a comprehensive and holistic approach.

#### **System Design Questions**

*What strategy might your institution employ to strike a balance between security and customer service? How can technology further the strategy via processes and policies? What data should be centralized/standardized, what features and capabilities should be centralized/standardized institution wide and what should be defined at the department/branch/account level versus the institutional or global product level?*

### 3.2 Loan Portfolio Management

Regulations issued by the central bank generally affect how an MFI needs to process its loans such as treatment of interest in arrears, tracking restructured loans, loan loss provisioning, and aging of loans in arrears.

### 3.2.1 Interest Treatment

Although the central bank may not specify explicitly how an MFI should account for interest, it will most likely stipulate acceptable treatment for interest revenue on loans in arrears. To meet these requirements one needs to consider how the MIS handles overdue interest beyond a certain period of time, say 30 days overdue. Given that this time period may vary, a degree of flexibility to specify interest treatment at the product definition, account and global level would be a useful feature in an MIS. Without this ability it is likely that some programming would be required to make changes to interest treatment. This later option may be entirely appropriate given that interest treatment is unlikely to change on a frequent basis, and may be a one-off customization change for a software supplier/programmer.

#### ***Loan Portfolio Questions – Interest Treatment***

*How does the Central Bank require overdue interest to be accounted for? How does this compare with existing treatment? Does the system have the functionality to treat interest income in this way? If overdue interest is placed in an 'interest in suspense' account, how will the system process recovered payments? Is it possible to age interest in this suspense account? If the central bank changes their requirements per the treatment of interest on any loans, how flexible is the system for handling variations to the current treatment? If system changes are required, can this be done by the user or will it require programming by the vendor? Are there tax regulations that require a different treatment of interest other than that stated by central bank? If yes how will these be dealt with?*

### 3.2.2 Loan Loss Provisioning

A well designed system to support loan loss provisioning can help to improve the efficiency and accuracy of this critical process. An integrated loan portfolio and accounting system should reduce the effort required to calculate and post provisions but it is imperative that this is done in a transparent way to allow checks on accuracy.

Ideally provisioning is fully automated as part of the end of month processes. However, use of a spreadsheet can also provide the necessary functionality. In fact, manual tools have the advantage of being more flexible than an integrated system since provision amounts can be easily changed. The major concern with a manual system is potential errors that may arise due to manual inputs. With an off-the-shelf application using a relational database static (or preferably dynamic) links should be possible with a spreadsheet to eliminate data entry errors. Controls should be in place to ensure that provisions are calculated using correct data from the MIS and that calculated provisions reconcile with accounting entries. Dynamic links to the necessary calculation template will insure correct data extraction. Static links which require manual manipulation to complete processing are prone to errors however this can be offset by using tiered spreadsheets, limiting manipulation and locking formulas for accuracy. Whichever method the MFI chooses, it should be tested with the software vendor to ensure sufficient usability.

In essence, the system must be able to make provisions based on regulatory requirements but also be flexible for management purposes (management may be more conservative in provisioning based on their knowledge of their portfolio). If a manual system is going to be used to calculate provisions, the source of all of the information required for provisioning should ideally be available in a single report. This implies that the system aging brackets are in line with those required by the regulators and that the total portfolio is also shown.

### **Loan Portfolio Questions – Loan Loss Provisioning**

*What is the central bank policy on provisioning? How do they define terms used (e.g. risk amount)? What aging categories are required? How do regulatory requirements differ from current provisioning policies? Can the current system be configured to automate the provisioning process? If yes, how can we check the accuracy of the provisions? If no, what manual system will be developed to support the provisioning process? Are additional reports required to assemble the necessary information? If provisioning will require manual input to another system how will this be reconciled with the loan portfolio system and the General Ledger?*

### **3.2.3 Aging of Arrears**

Provisioning also introduces the issue of the aging brackets used for reporting arrears. Typical options for these brackets are weekly, monthly and even bimonthly with the ideal system allowing for all of these options. Consideration must be paid to the length and number of aging brackets that the regulators require for provisioning purposes. For example, they may require provisions on a monthly basis up to 180 days where upon loans are then written off. An issue would arise in this case if the system only showed up to 120 days, thereafter grouping all as >120 days. Off-the-shelf applications should be flexible enough to allow the institution to define the aging brackets.

### **Loan Portfolio Questions – Aging of Arrears**

*What age brackets does the regulator require and how do these compare with those in the current or future system?*

### **3.2.4 Exiting Clients**

A mechanism for monitoring and reporting clients who leave the MFI may be required by the regulators. The first step is to establish the criteria that define an 'exiting' client, possibly using a period of time within which a client does not renew a loan and ceases to hold any savings. A report to identify such clients or alternatively an automated system that makes these accounts inactive can help identify, and ultimately report, on these clients.

### **Loan Portfolio Questions - Existing Clients**

*Do regulations require reporting on exiting clients? Is there a system in place to monitor these clients? If yes, is it adequate to meet regulatory needs? If no, what are requirements and how could this be reported by the system?*

### **3.2.5 Restructured Loans**

If the MFI has a policy of restructuring loans it is likely that these will need to be tracked and reported separately due to the high risk associated with these loans. It is also likely that the central bank will require higher provisioning on these loans. Both of these requirements imply that a unique identifier should be associated with restructured loans so they can easily be identified and separated from the rest of the portfolio. This could be achieved by introducing restructured loans as a new product type so that when a loan is restructured it is transferred to this product type with different provisioning levels. The functionality within an MIS for such transfers and regeneration of payment schedules needs to be investigated to ensure that the application can adequately handle the defined requirements (e.g. separate tracking of rescheduled loans).

### **Loan Portfolio Questions - Restructured Loans**

*Is this relevant i.e. are loans restructured? If yes, how does the system deal with restructured loans differently? How can the application be used to ensure enforcement of the institution's restructuring policies and proper tracking for aging and provisioning? Are they tracked and aged separately to normal loans? Is the system capable of provisioning on restructured loans?*

### **3.2.6 Additional Client Data**

Transformation may place greater demands on customer information requirements of the MIS. This could include the addition of information such as sector of employment, gender, age, etc. If this information is not already being collected, management will need to decide what is the most efficient and effective way to collect, store, report and analyze this information. New forms may need to be designed, input screens altered or certain fields made mandatory. The collection of this information will have front office implications that may well increase workload and slow down processing time. Consideration will also be required regarding how to get this information from existing clients.

Even if the required customer information is already being collected, transformation may require mapping of existing categories to those set out by the central bank. A good example of this is 'sector of employment'. The central bank may only want a high level categorization while the organization may require more detailed information about the nature of their clients work. A method to map, tier or move existing data categories will need to be designed and carried out, ensuring that the MFI does not lose out on detail that it requires. Transformation may also provide an opportunity to carry out data cleaning activities of existing information, possibly through validation of information with clients, and purging of collection of data that is not being used.

### **Loan Portfolio Questions - Additional Client Data**

*What customer information data does the central bank require? Is the data available in a manual form and therefore just requires entering or will clients need to be contacted individually? Does the MIS have ability to store the data? If it is not currently collected, what will be the processes to collect this information from both new and existing clients? If it is collected, how accurate is the existing data and does it fit with the required categories? What additional customer information might the MFI need to collect to ensure sufficient market intelligence for product development and risk management in the new/transformed operating environment to remain competitive? What is the priority of collecting this data, if there are resource limits?*

## **3.3 Savings and Deposits**

Prior to transformation the savings/deposit module of the MIS may be either non-existent or underutilized either due to a lack of, or limited savings products offered by the MFI. For this reason the savings module may represent the most significant investment of resources in terms of MIS transformation. Identifying the requirements for this module may be complicated by the fact that new savings products are either not yet designed or in a pilot stage. To help assist with this identification process it is useful to consider requirements analysis.

It is important to note that an advantage of using a proven off-the-shelf application is that it should already have a robust deposit management module with flexible parameters, so an MFI does not have to know the precise characteristics of the deposit products before progressing with the application selection. Given the sensitivity of sequencing of tasks in the transformation timeline this would not need to delay the process.

### 3.3.1 New Savings/Deposit Products

With transformation comes the opportunity for MFIs to introduce a variety of new savings/deposit products to their clients, ranging from open access savings account to fixed deposits. As with all new products this has implications on the MIS and careful consideration needs to be given to how the MIS will support the provision of these products as well as make available the necessary information to track their development and performance.

The MIS department will need to work closely with those responsible for new product development to identify requirements for the MIS saving module. The product development department should be able to detail the requirements for savings products, both for the immediately available products and those that may potentially be offered in the future. While it may be impossible to predict specific details of future products, it should be possible to identify the criteria that will be used to define a savings product as well as the common options for each criteria. For example one criteria would be 'interest procedure' with the options of 'Flat, tiered, minimum balance, average balance'. Once these requirements have been gathered and analyzed, the MIS department should be in a position to assess the level to which current systems, or proposed systems, meet these requirements.

Fortunately, a review of the top dozen banking applications shows a very finite set of parameters necessary to handle savings product—mainly minimum and maximum opening balance limitations, interest amounts, interest calculations and accrual posting, and withdrawal restrictions and/or fees. As long as the MIS application has the ability to set these business rules at the global, product, and account levels and enables some user defined options for each, an MFI should be relatively assured that any future savings/deposit products can be accommodated.

Good communication between the MIS and Product Development departments will help build an understanding of the limitations of the system and how these may affect the design of new products. This should not mean that system limitations should determine product design but rather system issues should be considered in the planning of new products to allow for programming efforts if required. If a savings module is currently installed, it may be helpful for the MIS department to provide the existing product definition criteria available in the system to the product development team so that they are aware of what is immediately available versus what features would require customization. Additionally co-operation between these two departments will help ensure the MIS department incorporates testing and rollout of new products as part of their own schedule, rather than being informed of the requirements at the last stage of product rollout and not having available resources to perform adequate testing.

Introducing new savings products will likely require new reports given the different information required to track these products. Certain features of savings products (e.g. number of free transactions) may open up the requirement to report on an element of customer behavior previously not collected (e.g. Number of transactions per month). An MIS application that includes a report generation tool (e.g. Crystal reports) that allows end users to create and format their own reports is extremely beneficial for this purpose. However the tool will only be useful if the required data exists in the database (e.g. number of transactions). If a new reporting requirement identifies the need to report on a data element that is currently not collected this will require both a change to the database structure and the software code, which most likely will mean supplier intervention for an off the shelf package. Depending on the frequency of this report being used, an alternative spreadsheet report is a possibility as well.

Transformation can result in a customer go from having one or two accounts (one loan account and one forced savings account) to multiple accounts each with its own function. The MFI will most likely want to analyze customer behavior and performance in all of their products, and therefore it becomes important to have access to an interface that shows the client portfolio with summary information about their performance in each product. While this information may be available through detailed analysis of each account it will be much more valuable to analyze collective behavior. Multiple products accessed by the same client make a strong case for systems that are integrated and customer focused, since these provide the ability to associate several accounts to one customer and thus more efficiently manage the customer relationship. The alternative is an account centric system where by each account is considered as separate to all other accounts or completely separate systems; this generally makes it difficult for summary behavior to be extracted.

### ***Savings and Deposit Questions - New saving Products***

*What systems are in place to involve the MIS department in the development of new products? Can we introduce new products without programming effort? How extensive is the product definition interface? Are the criteria and options identified as current and future requirements available within the system? If no, which are missing and how critical are these? Have all aspects of the product been fully tested on the system? e.g. interest calculations, fees. Are the necessary reports available to track progress and operations of these products? If no, can reports be designed in-house or does it require programming effort? If an in-house report generation tool is available, is the necessary data held in the database?*

### **3.3.2 Savings Product Criteria**

The ability to define a savings product will vary from one MIS application to another due to the different levels of access available to the user through a product definition interface. Regardless however, it is likely that the criteria used to define savings products will be somewhat similar. To give some indication of what these common criteria are and to help identify any issues that should be addressed in the definition process we have used the criteria available from the MIS software, Bankers Realm. They have been modified slightly to show only the key criteria and should not be interpreted as a replica of the product definition interface available within this application.

Some additional issues may need to be defined for savings products such as “who will act as the account beneficiary,” and “how will joint accounts be treated”. This may be defined either at the account or customer level, but regardless this functionality should be available as part of the MIS.

### ***Savings/Deposit Questions - Saving Product Criteria***

*What criteria are required to define savings products on the MIS? Is this currently available? Are all required options available for each criteria? If additional criteria exists in the system that has not be defined within the policy for the product how will these be established? (e.g. has it been considered how to treat dormant accounts?)*

**Table 2: Savings Product Definition**

Criteria	Options	Key questions
Product Type	Savings, fixed deposit	
Product ID	User definable	What unique identifier will be used for each product?
Account Prefix	User definable	How will an account numbering system identify the type of product? e.g. All account numbers beginning with 2 may be savings, and 203 as open access savings.
Minimum Balance	Free (no options as free text entered)	What is the minimum balance? Is there a penalty for falling beneath this balance? If so how are these applied? Are reports available to show who is below minimum balance?
Interest rate	Percentage	Monthly or yearly?
Interest frequency	Daily, monthly, weekly, yearly	How often will interest be paid and is this part of a system procedure (e.g. end of month)?
Interest calculation method	Flat, tiered, minimum balance, average balance	What procedure will be used to calculate interest?
Interest start date	Immediately, first on month etc	Will interest be paid within the first month the account is opened?
Interest rounding	e.g. Nearest '000, round down	How should interest calculations be rounded?
GL account interest payable	Select from available GL accounts	If integrated, which account will be used to capture interest payable
Charge type and amount	Fixed, per transaction, none	Will a flat fee be payable or will it be based on account usage?
Free transactions	Free (no options as free text entered)	How many free transactions are allowed? Within what time period?
Transaction costs	Enter cost per transaction	
Min fee/ Max fee	Limits on charges	Will there be a minimum or maximum charge on tariffs?
GL account tariff income	Select from available GL accounts	If integrated which account will be used to capture tariff received?
Dormancy criteria	Various- dormancy on zero balance followed by closure after certain time period, dormancy on no account activity for specified period, below a certain balance	When will accounts be made dormant? When will dormant accounts be closed? How will dormant accounts be reactivated? Criteria and cost for reactivation? What will happen to a dormant account balances?
Cheque Book	Yes/no	Is a cheque book available for this product?
Debit balance allowed	Yes/no	Will this account be allowed to go in debit?
Frozen product (indicates product no longer active)	Yes/no	This option will be beneficial when certain products are being phased out and it is necessary to restrict new accounts being opened with this product type. Can transactions still take place on frozen products?

Modified from BR, Craft Silicon (2003)

### 3.3.3 System Distinction between Compulsory and Voluntary Savings

Many MIS applications recognize the use of compulsory/forced savings accounts that are linked to loan accounts. The introduction of voluntary savings, which by definition should be independent from loan accounts, may require that the MIS apply different conditions to these accounts and therefore classify them differently. For example forced savings accounts may contain system controls to ensure that the client is saving according to schedule or retains a minimum balance related to their loan amount. In contrast voluntary savings accounts will have neither of these requirements but instead will have different conditions such as a number of free withdrawals per month. How the application associates one savings account with a loan account and another as independent needs to be considered. To deal with this requirement the MIS application needs to have two different product types so that forced savings have a different product definition interface to that used for voluntary savings. This would also imply that the system would apply different logic to those products identified as compulsory versus those that are voluntary, and may also require an additional data entry step for tellers.

A separate classification for voluntary and compulsory savings is particularly important where forced savings accounts are drawn on to make loan repayments in arrears. Unless such transfers are authorized (by the customer with documentation), voluntary accounts should never be used for loan repayments. Ideally this policy should be enforced by the system so that transfers between these accounts are not possible. If system control is not possible a manual one should be designed to ensure that transfers from voluntary savings accounts to loan accounts have the necessary customer authorization.

The requirement for system differentiation between compulsory and voluntary savings products may be negated if transformation coincides with abandoning compulsory savings. If this is the case the existing products will need to be reclassified within the system or migrated to the new system, which may require either a backend change in the database unless a feature exists within the MIS to change product type. Another consideration may result if the loan account requires an associated savings account or minimum account balance as a mandatory field. Obviously this condition will need to be removed or turned off, if forced savings are to be abandoned.

#### ***Savings/Deposit Questions - Compulsory and Voluntary Savings***

*Do voluntary savings accounts and compulsory savings accounts require different criteria to define them (i.e. different product definition interfaces)? If yes, how will the MIS application support the different criteria of each product? What controls are available to prevent unauthorized transfers from voluntary savings accounts to service loans? Will forced savings accounts be retained post transformation? If no, what will happen to the existing accounts?*

### 3.3.4 Client Access to Account Information - Account Statements and Passbooks

The success of savings products is very dependent on client's trust in the MFI and the belief that their money is safe and accessible during banking hours (and ultimately longer). Many new savers may take some time to build up this trust during which they require constant 'proof' that their money is credited to their account and available for withdrawal should they require it. This 'proof' has MIS implications as customers may frequently request account balances and statements of transactions. How the MIS will support this need must be considered and the pros and cons of available options considered closely in light of the organizational environment.

The following table looks at some of the possible alternatives for meeting this client need. By no means is this a final list of options but it does display some of the issues that arise.

In addition, MFIs should consider electronic customer inquires by phone, internet or kiosks. While this is perhaps beyond the capacity of the organization in year one or two of transformation, it is the ultimate direction the institutions will need to take to be competitive, responsive, and cost effective as they scale. Including basic requirements into the overall requirement set at this stage is therefore important.

**Table 3: Passbook Alternatives**

Option	Description	Pros	Cons
Manual passbooks	Manual book which becomes the clients property; shows all transactions and balances; updated by a member of the MFI staff either after each transaction or at the clients request	No expensive equipment required Easy for customers to understand Easy for staff to update	Time consuming Cost of passbooks Loss of passbook could present security concern for client Human errors in transcribing Fraudulent creation of books Possibly requires dedicated staff to update Difficult when customer has multiple accounts
Computer updated passbooks	Manual book which is updated using specially designed printers. Held by client and updated after each transaction or on client request.	Faster updating Accuracy Difficult to duplicate for fraud	Expensive printers Availability of the printers Expense of passbooks- must be compatible with printers Loss of passbook could present security concern for client Possibly requires dedicated staff Difficult when customer has multiple accounts
Account statements	Single statement printed periodically or on client request	Cheaper than passbooks Only print for customers who require Use same printers as used for receipts Fast and accurate	Some customers may not interpret as easily as a passbook Multiple statements for multiple accounts Frequent requests Potentially mandated by the central bank at least annually
Smart cards	Embedded computer chip in a plastic card that stores client and account information.	Clients can move from one branch to another All client information held in same place Opens up options for remote transactions Very difficult to duplicate reducing likelihood of fraud	May not eliminate the need for printouts Relatively expensive technology to product cards (although decreasing) Requires client education to build up trust in the technology Requires accessible device for clients to read or check account balances

### ***Savings/Deposit Questions - Access to Account Information***

*What is the information that customers want? When? With what frequency? What is viable for the MFI to produce balancing resources, client satisfaction and security? What method will be used for customers to track their account transactions? What implications does this method have on cashiers and front office IT, processes and policies? Are all the necessary resources for this method readily available e.g. printers, paper, cards?*

### **3.3.5 Fraud Prevention and Detection**

The introduction, or increase, in savings products can pose new opportunities for both internal and external acts of fraud and hence raises the importance of the internal controls capabilities of the MIS. Client identification methods can restrict the opportunity for fraud and the possibility of additional regulations help prevent illegal activities such as money laundering.

MFIs will have addressed the issue of client identification as part of their credit operations but the move to savings and the subsequent increase in withdrawals may put more pressure on identification processes, possibly exposing weaknesses in the system. An MIS that can support an electronic method of identification such as a scanned signature and photo card, a smart card or even biometrics will help to minimize the risk of unauthorized transactions resulting from forged identification. Considerations of which identification system to utilize will need to consider the literacy level of clients, availability of technology, the level of security required, and of course the cost. In some cases the method of identification can have multiple functionalities such as smart cards which enable client identification, branchless banking, offline transaction capabilities and 'passbook' functionality.

Increased worldwide concern about money laundering and financing of terrorism may result in MFIs being held accountable to new regulations that require implementation of Know Your Customer (KYC) policies and procedures as well as the reporting of suspicious transactions to the central bank. The extent to which these regulations are in place, and enforced varies from country to country but it is not unrealistic for MFIs to assume that at some stage in the future their MIS will need to support such anti-fraud measures. The implications may include record-keeping obligations and verifications of identifications, which could both require changes to the MIS in terms of data held. Criteria for suspicious transactions (e.g. extended period with no transactions followed by a large withdrawal) needs to be defined and reports made available to identify such transactions. These criteria may change over time so flexibility needs to be incorporated into any system of identification.

### ***Savings/Deposit Questions - Fraud Prevention***

*What mechanism will be used for client identification at the time of withdrawals and how does the system support this? What is the state of KYC regulations in the country of operation? What are the implications of these requirements on the MIS?*

### **3.3.6 Checking Accounts**

Where transformation entitles institutions to offer checking and/or current accounts, the MIS will need to support these products with functionality to post check based transactions and process clearing of funds. At the transaction level personal checks must be validated against a register that shows the check series allocated to each account. Check book administration processes will need to update this register as well as ensure that all appropriate charges are applied. The ability to stop payment of a specified check number is also required, possibly levying a charge for this service.

In terms of clearing, the MIS should contain processes that automatically clear effects on a daily basis, updating account balances with the cleared funds. A register of all presenting banks, along with the required days for clearing of each, must be maintained if the system is to automatically determine the value date for a check based transaction. While provisions for premature clearing of effects may be necessary the security surrounding this, and indeed all clearing processes, must be flawless. Lastly the MIS should facilitate the reconciliation of clearing accounts, either electronically if transaction data can be imported from the clearing bank, or manually using reports designed for this purpose.

#### **Savings/Deposit Questions – Chequing Accounts**

*Will checking accounts be offered? How will checks be administered? How will the MIS handle check based transactions e.g. capturing check details on the system at the time they are received? What are the central bank regulations regarding checking accounts? How will these regulations and the market in general, influence product design and processes? Have all processes to support these products been carefully designed and tested (e.g. cheque book administration, check returns, stop payments, movements to and from clearing house, clearing, reconciliation with clearing house and reporting)? How will the system support charges associated with these accounts (e.g. cost of check books, counter checks sold, stamp duty and charges associated with stopping payments on lost or spoiled checks)?*

### **3.3.7 Inter-branch Transactions/Branchless Banking**

Providing a service whereby clients can access their savings account from any branch will be an attractive benefit for many customers. This functionality may however be restricted by the extent to which branches have a centralized database of customer information or communication access to verify client details at their home branch. Alternative technology such as smart cards may eliminate, or reduce the burden on communications and be an attractive alternative to provide inter-branch, ATM and point of sale (POS) services. Fax, chat, text or SMS messaging could be a less expensive alternative than the branch only and smart card solution, but unlikely to be viable in the long-term.

#### **Savings/Deposit Questions - Inter-branch Transactions**

*Are inter-branch transactions required? What is the current customer and market demand for easy, convenient access to savings accounts? What systems, manual or electronic, are in place to handle these transfers?*

### **3.3.8 Teller Services**

MFIs that have not provided teller services historically will need to consider how they will provide clients with convenient access to their increased range of services. Form and location of customer access points are important strategic business decisions that will have an array of implementation issues that must be considered. Where the access point is determined to be through the provision of teller services several issues may arise that influence the MIS. Firstly the physical location of tellers needs to be suitable for the hardware required considering appearance as well as functionality, security and power. Secondly, teller services will need to be supported by the MIS software to allow tellers to securely input transactions as they occur, obtain the necessary vouchers, update passbooks (if utilized) and be supervised throughout this process. Additionally tellers will need functionality/ reports to reconcile their cash tills with system posting at the end of day (such as a cashier summary sheet). Additional functionalities to evaluate are the general navigation of the interface, its drill-down capabilities and, speed—teller and system performance, array of transactions, secure log-in, voiding capabilities, multi-transaction and summary views. Careful consideration of the MIS user interface in terms of ease of use and availability of required information from a limited number of screens will make the cashiers job considerable easier and ultimately contributes to high levels of customer service

### **Savings/Deposit Question - Teller Services**

*Are teller services currently available? If yes will they need to be changed to accommodate increased transaction volume arising from additional products and growth? If not available how will these be accommodated? Is the physical location suitable for the hardware required? Have of cashier procedures been defined and how the system will support these?*

## **3.4 Accounting**

The accounting module may be the module least affected by transformation process although this will depend on the extent to which the accounting function is already computerized. With that noted, regulatory requirements and growth may well have a large impact particularly on administration regarding the chart of accounts.

### **3.4.1 Integration with the General Ledger**

A key issue is to determine how the general ledger (GL) will be updated in a process that is timely, reliable and with a sufficient level of internal control. A decision needs to be made whether this is done in real time with changes in the savings and loans modules being immediately reflected in the relevant accounts, or indirectly on a periodic basis, usually part of end of day processing to update the accounts. The end result should be the same; a GL account balance that reconciles with individual ledger accounts. While transformation will not change this basic requirement it may result in higher transaction volumes that ultimately put strain on the interface between non-integrated modules and the underlying processing power of the information system. Depending on how the current information system is designed, this may result in an increase of the time required to update the accounts module, possibly making it unrealistic to obtain a balance sheet by end of day, a stipulation in the case of Bank of Uganda. For this reason preparation for transformation should assess the scalability of a transfer process between modules, ensuring that the system has the capability to meet future demands. If it is lacking, then an alternative will need to be designed and implemented, for example moving from the end of day (EOD) processing to twice or three times a day, or to real time posting.

While an integrated application may not present issues in terms of processes to update the accounting module it should not be assumed that the integrated MIS will automatically ensure all ledgers are balanced. Depending on the system, it is possible that through MIS-posting directly to the GL control account the ledgers will not balance. To identify such errors and mismatches a system must provide functionality to identify when ledgers do not reconcile, possibly through warning messages that appear during the end of day processing. When conducting the due diligence for a new information system this capability should be verified. Balancing ledgers has always been an important issue for MFIs and it becomes even more critical with regulatory reporting due to penalties for misreporting. Consequently, this places greater pressure on the information systems used to identify and reconcile ledgers.

### **3.4.2 Chart of Accounts**

When an MIS is not centralized and each branch has its own installation of the accounts module, it is imperative that a standardized chart of accounts is implemented. To enforce this, a system to administer and control the chart of accounts from a central point is required. The system must ensure that all branches remain synchronized when new accounts are added or changes are made to existing accounts. Useful tools to assist in this task are spreadsheets that act as a central record of all accounts, showing which branches have which account and a detailed description of their usage. Central bank reporting regulations

will also have an impact on the administration of the chart of accounts. As part of the control over the accounts, security features of an MIS that restrict changes to the chart of accounts at the branch level may be implemented; however this needs to be done carefully so as to balance security with efficiency.

As part of meeting regulatory requirements, a system to ensure that the MFIs chart of accounts is aligned with central bank formats will need to be established. This involves ensuring that any internal change to the chart of accounts does not adversely affect the detail required on compliance reports. This relates back to the system for administration and control of the accounts mentioned earlier, but adds the requirement that this system also track which accounts are required by Central Bank so as to ensure they are not affected by any internal changes.

### **3.4.3 Other Accounting Functions**

Treatment of fixed assets and depreciation of same may not be something new for an MFI that is transforming, but care must be taken to ensure that the current treatment is in compliance with regulations. In certain cases, the regulatory body may stipulate the life of each asset type or perhaps the acceptable rate of amortization. The MIS should be able to produce a fixed asset register at any point in time showing the net book value of each asset and possibly some additional information including supplier, location, date of purchase, depreciation rate and term. Ideally, the MIS will automatically apply the depreciation expense as part of the end of month process. Otherwise this can be tracked in an Excel spreadsheet and manually posted to the accounting module monthly.

The topic of interest treatment has been discussed in the loan portfolio module but is repeated here as a more general discussion of cash-based accounting versus a system of accruals. Regulations may differ on this topic but needless to say it is worthwhile to ensure that the MFI is in compliance. A shift of accounting treatment can pose quite a challenge and should be carefully thought out and implemented. For example a shift to accruals may introduce issues regarding reversals after a certain time period on a non performing loan. Before shifting accounting procedures one would need to ensure that the MIS was capable of either identifying such reversals or preferably automating them.

Tax implications may arise if interest income is accounted for on a cash basis. As part of the end of year process it may be necessary to accrue interest income for a certain period before calculating tax that is due. This necessitates being able to identify the interest portion of payments due for a specified period which may or may not be straightforward depending on the way the system tracks payments (i.e. as principle only or principle plus interest).

## **3.5 Integration of Systems**

There is much debate regarding the level of integration between the various modules of an MIS. Some feel that integration of accounts, savings and loans modules is the only option for large organizations due to the efficiency gains—in data integrity, system maintenance, usability, interoperability, analysis, security, and future extensions of the system. Others feel that integrated systems require compromise on functionality in one or more modules, since it has historically been difficult to provide a high level of functionality and flexibility in all modules. Ultimately each MFI will need to decide the level of integration that is most suited for their needs. It is worth noting that the majority of off-the-shelf MIS software is integrated and therefore for those that opt for a package solution as opposed to a bespoke application will most likely be dealing with an integrated system.

### 3.6 Reporting

Regulatory reporting requirements have been referred to throughout this paper since meeting these requirements may impact all of the elements of the MIS. Reporting content and frequency may vary but generally will be comprised of liquidity, capital adequacy, portfolio quality, financial position (balance sheet, income statement, cash-flow statement) loans extended to insiders, and loan loss provision, with frequency ranging from daily or weekly to quarterly submissions. Late submission of reports may carry financial penalties for the MFI as would inaccurate reporting. Therefore establishing the necessary business processes and maximizing alignment of the MIS with these processes is critical. The ability of an MFI to meet regulatory reporting requirements is likely to be assessed as part of the initial application for transformation, adding further importance to this area. It is imperative that the MFI identify all the data fields and reporting formats up-front to ensure the new application selected can meet the requirements or, alternatively that the vendor (as a condition of the contract) provides the reports and/or the capability to develop the reports going forward is developed in-house.

**Table 4: Reporting Design Process**

	TASK
Information Gathering	Study the reporting requirements as set out in the MDI Act and its implementing regulations and review loan agreements, memoranda of understanding and contracts with stakeholders to determine reporting requirements. Conduct staff interviews and site visits to assess what reports are currently generated, when they are generated and how they are used.
External Reporting Policies	Draw up an external reporting compliance policy detailing a framework specifying who must produce what reports and when. Present the framework to the key staff responsible for its implementation.
Internal Reporting Policies	Draw up an internal reporting compliance policy which should include recommended changes to internal reporting, its policies and its procedures to clarify who must produce what reports and when. Establish a framework for action and monitoring once reports are produced and distributed. Present the policy to the key staff responsible.
Reporting Matrices	Draw up a matrix of: <ul style="list-style-type: none"> <li>• Mandatory external reports which an organisation must produce once it is licensed.</li> <li>• Currently produced internal reports, who receives them and when and the value that they add or do not add.</li> </ul>
Meet with Regulators	Meet with Central Bank to review the proposed reporting framework and ensure that the system, once modified as proposed, will meet all the requirements.
Gap Analysis: MIS	Work with IT department to ensure that the information systems are in place to generate the mandatory reports and that they are being produced and provided to the appropriate personnel. Identify specific gaps where the appropriate reports do not exist or where the necessary data is not collected and recommend solutions to fill gaps.
Implementation	Train staff involved in implementation of the internal reporting policy/framework.

SOURCE: *Enlaiten Limited Reporting Proposal to Uganda Women’s Finance Trust*, September 2004, page 7. Reprinted with permission.

In identifying the reporting requirements, it may be necessary to confirm understanding of central bank requirements and to ensure that guidelines have been finalized prior to commencing MIS changes. Once clarified, each data element that is required needs to be compared with those currently available in the system. If the required data is not currently collected, a system of collection will need to be designed and a decision made regarding what should be manual or automated. Consideration of the volumes of data and the cost of collection will assist with this decision making process as will a discussion of the way in which information will be used. For example reporting on client's economic activity for sector-based risk analysis will entail a high volume of data and therefore may justify automation. In contrast, loans extended to insiders will generally be low volume and can easily be tracked using simple electronic means such as Excel or by manual methods.

Once mechanisms of collection have been identified, it is necessary to determine how the information will be processed and with what frequency. This includes consolidation of data from branches and any required calculations such as computation of capital adequacy. Clear responsibility for these processes needs to be established and may require co-operation from multiple departments including IT, branch staff and head office accounts. Despite these multiple responsibilities, one person should ultimately be responsible for overseeing the processes and to ensure that reports are complete, accurate and submitted on time.

Reports submitted to the central bank will generally need to be signed by the CEO and/or the most senior accountant, which implies that availability of these key people will need to be confirmed in advance of submission. Method of submission will also need to be considered. If electronic submission is permitted, it is likely that security measures such as electronic signatures may need to be established.

Efficient systems to collect, collate, process and submit reporting information will reduce the risk of missing deadlines or inaccurate reporting. All processes should be formally tested to identify any issues and where applicable back up procedures designed so that loss of communication links, for example, do not jeopardize the ability of the organization to comply. In addition requirements should not be considered to be static as new reporting requirements may emerge over time and systems development must incorporate these changes. If a development effort is required each time new reports are required, or changes to existing reports evolve, then it should be considered how best to carry out this development, either in-house or through requests to the software supplier. Obviously the latter option requires a responsive supplier who can rapidly turn around such requests. Ideally, with an integrated MIS, the MFI should have the capability to generate new reports through a user-friendly interface in along with the necessary in house skills.

**Table 5: Reporting Needs**

	<b>Management Information Requirements</b>	<b>Central Bank Reporting Requirements</b>	<b>Other Stakeholders' Information Requirements</b>
Needs Assessment/ Agreement	Documentation of all management information needs including the required frequency of production of reports. Agreement internally on the meaning of common terms. Agreement of departments responsible for producing particular information. Agreement of a policy on data integrity and completeness.	Documentation on reports required, including their formats and due dates. Definition of Terms. Guidelines on completion of reports Agreement of departments responsible for producing particular information.	Documentation on all reports required, including their formats and due dates. Definition of Terms. Guidelines on completion of report Agreement of departments responsible for producing particular information.
Analysis	Confirm that all data required can be captured in an appropriate and affordable manner. Define and agree on report layouts for programmer to implement. Define access rights for the various reports. Determine the skill level of the staff who produce the reports	Confirm that all data required can be captured in an appropriate and efficient manner. If not, determine the process to be used to obtain the information at a future date. Determine the skill level of the staff who produce the reports. Work with a programmer to ensure defined reports are produced by the system.	Confirm all data required can be captured in an appropriate and efficient manner. If not, determine the process to be used to obtain the information at a future date. Determine the skill level of the staff who produce the reports Work with a programmer to ensure defined reports are produced by the system.
Implementation: Process flow & Procedures	Capture 'Test data' for input into the system. Review reports produced from the test data. Agree and make amendments in need for customization of system. Test 'system produced reports' after customization. Write guidelines for production of the 'system produced reports'.	Capture 'Test data' for input into the system. Review reports produced from the test data. Agree and make amendments in need to report layouts. Define any system gaps and need for customization of system. Test 'system produced reports' after customization.	Capture 'Test data' for input not the system. Review reports produced from the test data. Agree and make amendments in need to report layouts. Define any system gaps and need for customization of system. Test 'system produced reports' after customization. Confirmation of deals.
Review & Evaluation	Coordinate meetings to review/ accept system produced reports and their accompanying guidelines.	Coordinate meetings to review/accept system produced reports and their accompanying guidelines.	Coordinate meetings to review/accept system produced reports and their accompanying guidelines.
Periodic Audits	Internal audit to review the integrity of reports on a periodic basis.	Internal audit to review the integrity of reports on a periodic basis.	Internal audit to review the integrity of reports on a periodic basis.
Reports	Matrix of internal reports with due dates and officers responsible. Calendar prompting for reports to be produced and submitted. Information on late submissions.	Matrix of regulatory reports with due dates and officers responsible. Calendar prompting for reports to be produced and submitted. Information on late submissions	Matrix of external reports with due dates and officers responsible. Calendar prompting for reports to be produced and submitted. Information on late submissions

SOURCE: *Enliten Limited Reporting Proposal to Uganda Women's Finance Trust*, September 2004, page 6. Reprinted with permission.

### **3.6.1 Operations vs. Regulatory Requirements**

Operational and management reporting requirements must be carefully balanced with those of the regulatory body. In a worse case scenario an MFI could focus entirely on meeting central bank requirements and jeopardize the availability of information for operations and management. It is necessary to ensure that the information key to the organization remains available due to changes implemented to meet transformation. Identification of key management reports and analysis of the data that make up these reports will help to ensure this is the case. A good example of this is with aging brackets. If the MFI was reporting arrears on a weekly basis and shifted to monthly to allow for provisioning and the required portfolio at risk reports for the central bank, a key indicator of trends in arrears will have been removed. This difference can have implications for recovery mechanisms and hence needs to be avoided.

### **3.7 Expanding Outreach Services/Delivery Channel Technology**

There are many exciting initiatives emerging in the microfinance sector that demonstrate how technology can help MFIs expand outreach and improve their services. Such up-front delivery channel options include ATM or PoS networks (for transactions), hand held computers (for remote data capture), smart cards (for offline transactions and identification), and biometrics (for authentication), interactive voice response (for client access of account information) to name just a few. Our interest in these technologies is not to discuss the specifics of each initiative but rather to focus on their impact on the MIS.<sup>4</sup> Basically there are three main issues that need to be considered with any delivery channel initiative: MIS stability; level of integration; and information processing and security. These issues are not meant to detract from support for MFIs exploring the delivery channel options, but rather as considerations of timing/sequencing, capital and effort required to launch these initiatives successfully. Taking on too many large-scale changes simultaneously is risky, overwhelming, and challenging for staff to manage. The IT governance committee is responsible for prioritizing such initiatives and allocating funding to ensure success and business value added for the institution for each initiative.

Firstly, and perhaps most importantly, the stability of the MIS should be prioritized over new initiatives. If weaknesses are present in the existing system it is unlikely that introduction of new services with associated new technology and processes, will do anything but add further instability to the system, possibly jeopardizing both the MIS and the success of these new services. The stability of the system should be assessed from various perspectives including management, users, and from a technological standpoint. If all of these stakeholders can verify that the system is meeting their key information requirements and can vouch for the capacity of the system and organization to absorb the change associated with a new initiative, only then should new projects should be considered feasible.

The second consideration involves determining exactly how a new technological element will interface with the existing MIS. This typically involves a mechanism to transfer data from one application to another for example from devices such as hand-held computers or ATMs, and possibly provide a two-way replication facility. In designing an interface, or analyzing an MIS system that possess an interface, consideration must be given to the alternatives for communications, security, and efficiency of the transfer process. If development of a connector or interface is required to the internal MIS application, responsibility for this development must be clearly established. It cannot be assumed that the MIS software provider will be willing, or able, to build the inter-operability between the two technologies. At the same time, limitations on access to source code may prevent other programmers from building the interface. At a minimum, MFIs should look to use applications that follow standard protocols for data transfer, or at least standard front-ends should be given priority as well as other off-the-shelf commercial applications over proprietary options.

<sup>4</sup>For more detailed discussions regarding e-banking (<http://www.microfin.com/ebanking.htm>) offers several resources

Lastly, the ability of the MIS to process and track transactions captured through delivery channels needs to be considered. New services present management with an opportunity to better understand their clients through a new source of information. This implies that delivery channel technology will affect not just the input requirements of the MIS but also the processing and output as well as security requirements. Ideally the MIS needs not to only interface with e-banking solutions but must incorporate the information from these sources as part of the overall information available to management and support their decisions regarding this service.

### **3.8 Security and Administration**

Standard feature requirements for any MIS application include tracking every user on the system with a user defined profile, transaction type, date and time stamps as well as restrictions. Profiles should be easily established by role (loan officer, teller, branch manager) as well as by feature (loan disbursements, new applications, savings account look-up). The application should also include basic utilities and restrictions to ensure proper administration and access of the application and the corresponding database. Only users with high-level access should be authorized with these capabilities.

## 4. Infrastructure

Any growing institution will recognize the importance of a solid infrastructure platform that is designed to support both growth and change. Systems that are already under strain cannot be expected to cope with increasing numbers of transactions, more complex data and increasing communications requirements arising from regulatory reporting. To support this, an institution needs to have confidence in both the application software that is used as well as the hardware, communications and other infrastructure required to run the MIS application. This confidence is characterized by accuracy of the system, trust by users in that accuracy, as well as the user-friendliness of the system and ease of information retrieval to support daily operations.

Hardware is the platform/infrastructure that organization operates and thus it must provide framework, standards, as well as as much flexibility as possible. While hardware is like the skeleton frame of a house, software is the internal environment that should be able to change easily as the needs of the occupants change. An institution does not go from a static system through a big change process to settle at another static state. As market demands are constantly changing and moving, so to must an institution's operations—products, processes, policies, etc. Therefore, the underlying hardware platform must enable this type of change.

### 4.1 Hardware

In light of transformation one needs to consider what the effect will be on the various hardware elements that comprise and support the MIS. Where a new MIS application is to be installed hardware requirements need to be identified, procured and installed, most likely acting on recommendations of the software supplier (software requirements design specifications). Alternatively if the existing MIS is to be retained, the hardware will need to be assessed in terms of its capacity to support future levels of activity (within the context of new architecture design, initial use and replacement plan). Analysis of the existing system should identify any hardware issues that are currently limiting the system and if feasible, systems load-testing should be carried out to observe how systems cope with increasing demands and possibly to identify maximum capacity.

**Once hardware performance** (existing or future) is addressed, attention should be paid to the processes used to manage technology in the organization. This includes procurement, deployment, maintenance and support.

**Procurement procedures** for new hardware should be formalized as part of the organizations general procurement policies. In addition to these, a system to identify and assess new hardware requirements should be established. For example, how will branches communicate the need for additional computers and how will IT assess if this need is genuine? Rationalizing the distribution of hardware may be done according to formalized criteria such as number of transactions or clients. Regardless of how this is done, justification for the new hardware should be available to those who are responsible for the authorizing the purchase.

**Deploying new hardware** should be completed in a controlled manner so that the IT department knows exactly what hardware is installed at each location. This should be tracked in a hardware inventory database or spreadsheet that includes information about the supplier, purchase date, extent of warranty, specification, installation location, and possibly software installed or configuration details. This same database could also be used to track maintenance and warranty issues and therefore provide a full history of each piece of hardware deployed throughout the organization.

**Hardware maintenance** involves routine preventative measures taken to reduce the risk of failure. It may include both physical and logical checks on the hardware and is particularly important where physical elements such as dust and heat may adversely affect the technology. Maintenance contracts with external suppliers could assist with the bulk of this work but care must be taken to ensure the quality and thoroughness of their work and their potential to support the growth of the MFI. Where maintenance is done in-house, it should be verified that the capacity to handle increasing demands is available and will not be jeopardized by other demands on the IT department. A schedule for maintenance should be established and servicing events tracked, possibly as part of a hardware inventory database. This will provide IT managers with a summarized view of the hardware deployed in the organization and help estimate lifetime and performance of hardware.

**Supporting hardware** and its users can be a time consuming task that requires a mix of skills. Increasing the use of technology throughout the MFI will have a concurrent effect on the levels of support required. Whether support is provided by an in-house IT department, or contracted out to a third party, a ratio of support personnel to users should be maintained. This ratio will be influenced by the extent of the user's technical experience but generally can be determined through analysis of support calls received. A database of support calls can be a useful tool to assist with the support function, enabling efficient resolution of calls through identification of common fixes and known issues.

#### **Infrastructure Questions – Hardware**

*Is current IT capacity capable of supporting a growing number of users? What new requirements for hardware arise from the transformation? How will specifications for this hardware be identified? If no new hardware is required, how can existing hardware maintain current MIS performance with increasing loads? What systems are in place to ensure hardware maintenance is carried out and how will these deal with an increase in hardware? Are the necessary controls in place to track hardware deployment? What are the software, networking, and connectivity architecture? How does this impact the hardware choices: operating systems, memory, type? What are the power requirements of the equipment? What are the durability, replacement frequency, usability, and costs (initial and replacement) of the equipment?*

## **4.2 Information Communications Technology**

Transformation places new demands on the MIS in terms of its ability to centralize information from different operating locations. Regulatory reporting requirements and liquidity management requires Head Office to be aware of the position and performance of their branches with greater frequency and reliability. The frequency of physical transfer of data, which may suffice in the early stages of growth may no longer be sufficient, prompting MFIs to establish a wide area network (WAN), which permits the electronic transfer of data between two, or more, locations. Various communication alternatives are available for setting up a WAN and the decision regarding which is most suitable for the organization is based on a balance of factors such as cost, transmission speed and reliability. Other factors beyond regulatory requirements drive decisions (and justify the cost of a WAN) to centralize control of data—increased data integrity, better risk management (increased security, decreased fraud) branchless banking and easier customer information access. WANs also leverage IT resources more wisely, facilitate easier analysis of data for new product development, marketing, and strategic planning. The decision to build a WAN also enables better communication across a geographical dispersed staff, easier coordination scheduling, easier information dissemination, alternative training options, better virtual project management, and generally better staff monitoring and institutional over site. All these drivers must be considered when designing the new technology infrastructure. Technology choices MUST further business objectives to create value added for the institution; therefore, hardware choices must be made within the context of the transformation strategy.

Given the importance of communications and the cost of different alternatives, the method of selecting a communications supplier or telecommunication alternative should follow the same structured decision-making process as the software selection process. This includes analysis of the requirements and identification of alternatives. This decision should be based on pre-established criteria set—strengths and weaknesses, implementation and finally post-implementation review to ensure that the connection is operating as intended. Decisions should be made by senior management with input from technical experts about the strengths and weaknesses of each alternative as this is a significant business decision, not just a technology purchase.

Identification of communication requirements needs to consider both current and future operations and services to ensure that the communication infrastructure is flexible enough to cope with both change and growth. Availability of telecommunications alternatives will vary considerably from one country to the next and are constantly changing as new technology emerges and regulations governing their use changes. Some of the typical alternatives include dial up, leased line (copper or fiber optics), wireless, and satellite. Each MFI will need to investigate which alternatives are available to them and then rate them according to reliability, speed, and cost. Additional considerations include interoperability with existing hardware and software applications in use or planned for use, availability of support (in-house versus external), supplier reputation and general customer service, and the cost of back-up strategies. A short list of vendors should be given the opportunity to demonstrate their services so that they can be tested, especially where the technology or service is relatively new.

#### **Infrastructure Questions – Information Communications Technology**

*How often will communication be required—periodically or continuous (real time connection versus batch uploads)? What will be the typical size of the data that is being transferred? How many locations need to be connected? What ICT infrastructure is available? What level of reliability is required—how will the business be affected if the communication link becomes unavailable, for what period/length of time? What information needs to be sent—entire database or just partial records? How will/might these requirements change over time? What specifications of the new system, other than data transfer, rely on or could leverage connectivity? What are the specific requirements for these? What is the priority ranking of these additional connectivity requirements?*

### **4.3 Power**

In addition to hardware and telecommunications, issues such as the availability and quality of power supply must be considered. Protection against power surges can be achieved either through use of a Universal Power Supply (UPS) or a stabilizer attached to the main power supply. While these provide against unstable power supply, only the UPS will provide backup power in the event of full failure. Additional alternatives for backup power supply are generators or battery powered inverters. Of all these options only the inverter will ensure that low levels of power will be supplemented.

#### **Infrastructure Questions – Power**

*What is the quality, strength and reliability of the power supply at each location? What are the alternative sources of power? What additional hardware is required to ensure a stable and reliable source of power? What hardware options have the lowest power requirements? Which are the most durable for the price? Which have the longest life or lowest replacement?*

## 5. MIS Security

Security can be defined as measures taken to protect the MIS both physically and logically from any event that may result either in compromising the integrity of the information produced by the system, or alternatively an event that contributes to unavailability of the system. This includes protection against unauthorized access, system misuse and physical or software related failures. Protecting the technological and information assets that make up the MIS is likely to have been an ongoing concern for those responsible for IT, however transformation may bring this to the forefront both from a regulators perspective in their assessment of the MIS and from potential investors.

### 5.1 MIS Security Policy

A comprehensive IT security policy document should be available as a representation of the MFIs policies and procedures implemented to address security. The IT security policy should identify risks to the systems and provide an analysis of the likelihood of occurrence and impact on systems. Risks should include active threats that arise from intentional misuse of the system, and passive threats such as system faults or natural disasters. Policies and procedures detailed in the document should demonstrate the controls to mitigate the likelihood or impact of these risks. Lastly a security log should be kept to show how the security policy has been implemented and updated over time to address changes to the security environment. Any new policies should be reflected in the IT Security Policy document.

### 5.2 Control Environment

An MIS can be controlled by a combination of general controls and application controls, which both seek to limit the likelihood or impact of breaches in security. General controls include hardware, software and manual procedures that create a control environment, while application based controls depend on the features and programming of the MIS software. Since application controls are software specific they may be beyond the MFI's ability to design but should be considered when assessing the security features of an MIS application. Ideally they should cover input, processing and output, and include procedures such as error handling, input validation and control totals.

General controls can be classified in a number of ways and include a range of different procedures. Table 6 lists some common general controls utilized by MFIs and provides suggestions regarding their design.

**Table 6: Typical General Controls**

Type of control	Description	Sample controls
Physical	Protects against physical hazards and unauthorized physical access to systems	Restricted access to key hardware, along with storage locations protection from hazards, fire extinguishers, and power surge protection.
Logical	Protects against unauthorized access to systems	Network and database security including passwords and access controls, encryption during data transfer, audit trail
Human	Protects against unintentional damage as a result of user actions	Training, organizational culture fostering security
Implementation	Protects against exposing the system to additional risk as a result of systems development	Formal change control procedures, testing, documentation to support changes
Operational	Protects against failure of systems and security measures	Routine systems maintenance and monitoring, data backups, disaster recovery planning and IS Internal Audit

It is beyond the scope of this paper to discuss all of these controls in detail but key implementation and operational controls are discussed as these often have the greatest impact on MIS operations and resources.

### **5.3 Systems Backups and Disaster Recovery**

System backups are most likely a familiar concept to organizations that have reached the level of transformation however their importance escalates with growth so it is worthwhile considering the main points. Backup processes should be part of daily procedures, either manual or automated, and should result in a copy of the MIS database in a format that can be stored both onsite and offsite. Various storage media is available to facilitate database backup including optical tapes, CD writers, external hard drives, and mirror servers. It is recommended that end of month backups are stored as permanent backups while daily backups are overwritten in rotation. A backup process should not be time consuming, particularly when responsibility is delegated to those beyond the IT department who possibly do not understand the importance of the process. Backups should be routinely tested so as to avoid any surprises when they are actually required.

Formulating a disaster recovery plan provides an organization with a certain amount of security in the event of partial or full loss of the system. It identifies the scenarios that could lead to unavailability of the MIS and then details the steps that should be followed to ensure business continuity. Scenarios should range from partial loss of the system (e.g. Failure of hard disk at branch or failure of communication link) to complete loss of facilities. In an ideal world duplication of hardware and facilities would be maintained to protect against disruption of service in the event of a disaster, but given the cost implications of this it is probably more likely that only certain critical pieces of hardware are kept in reserve to cover such events. Possibly a more realistic control is to maintain detailed records of all equipment specifications and lead times on critical spares.

The cost of such backup and redundancy measures must be considered in comparison to the benefits that they provide both in revenues gained and image maintained. The most common benchmark for this analysis is calculating the number of business days (and associated value of data) an institution is willing to lose before it is worth the expense—tangible and intangible.

### **5.4 IS Audit**

It will be up to the internal audit department to ensure that both application controls and general controls are operating as designed and that the level of risk remains acceptable. This implies the necessary technical skills are available within the audit department, with extensive knowledge of the MIS software both as a user and a technical specialist. Alternatively this service can be hired as needed during design and specific audit periods or system changes. The consultant(s) should have a background in finance, accounting and information systems. Not only will this help ensure that controls are working but it will help ensure that the IT department has considered all possible threats and responded with appropriately designed controls. An IS audit is also one of the key ways in which the IT department can be checked upon to ensure that no member has misused their access to the system, which is generally extensive and often unsupervised.

## 5.5 System Change Control

Ideally a formal IT governance structure should be established to specify how IT decisions are made, carried out, reinforced and even challenged. The structure chosen should be in alignment with the organizational culture, strategy, and structure, properly identifying who is responsible for critical IT decisions.<sup>5</sup> This ensures that IT-related decisions embody uniform principles and are properly placed within the business strategy and resources of the organization. The IT committee should include members of senior management, typically head of operations, information technology, and all business units, and in some case the executive director as well if the organization is small. Some of the members of the IT Task Force Team for the MIS project would be good candidates for this long-standing committee.

System changes are inevitable and may range from minor updates to major upgrades of software. Lack of control during the implementation of system changes can pose a serious risk to the MIS, possibly resulting in unavailability or jeopardizing the integrity of the information. Regardless of the extent and nature of the system change, a standard approach should be adopted if risk is to be minimized. While the process may seem laborious, treated informally, change can destabilize the system and absorb significant amounts of resource. Aggregating changes into a full version update can help to improve efficiency and is recommended. The basic steps to an update or upgrade process include identification, analysis, testing, implementation, evaluation and support.

### ***Identification***

A process to identify requested system changes should also include a defined method for communicating to the MIS department and subsequently a process to record, vet, prioritize, and authorize the changes. A change request database, possibly related to a support call database, can help assist in the management of changes from request through to implementation.

### ***Analysis***

Once a change has been given initial approval further analysis may be required to understand the details of system changes required to fulfill the request. These details should be documented as proof that the effects of the change have been thoroughly considered. Analysis should also include an estimate of time/budget resource to deliver the change, either through internal efforts or external development.

### ***Testing***

Delivery of a system change, either as a patch or a full version upgrade must be sufficiently tested prior to implementation. Testing has two main objectives—to ensure that the change works as specified and to ensure that it has not had any adverse effects on the rest of the system. Standard test routines should be followed to ensure that all processes are carried out with the new version of the software (e.g. create new loan, disburse, end of period process—day/month). These should be done on a replica of the live system with all test results documented and issues reported back to development.

### ***Implementation***

Methods to implement software changes may vary ranging from individual updates to remote updates via FTP or WAN connection. The different methods available will influence the resources required to implement change, with the former requiring significant time and control measures to track which installation is on which version of the software. A spreadsheet to track versions and software implemented at each branch can prove very useful for this purpose.

<sup>5</sup>Six IT Decisions Your IT People Shouldn't Make, Jeanne W. Ross and Peter Weill, November 2002 HB Review.

***Evaluation***

Despite the level of testing carried out it is still possible that issues will be identified post implementation. Depending on the severity of these issues they may require a rollback to previous versions or additional bug fixes. For this reason it is recommended that only one branch receive the update initially, assuming it is a decentralized system, so as to iron out any remaining issues before the changes are rolled out to the remaining branches.

***Support***

All changes should be accompanied by documentation. This should be both for the back end changes, where the database has been altered, and for the users so that they are aware of how to operate the change. The MIS department should be prepared to handle additional support calls post implementation and should have available the necessary resources.

## 6. Human Resources Implications

Many of the issues discussed in this chapter require that an organization have sufficient access to the appropriate IT resources. This includes ensuring that the correct mixture of technical, management, business and interpersonal skills are available in sufficient quantities to those charged with responsibility for the MIS. Additionally, organizational growth puts pressure on the leadership roles in IT, as transformation demands that use of IT is continuously evolving, taking advantage of technological alternatives to help the business achieve its goals. Organizations that have experienced gradual adoption of IT may need to take stock of available resources to ensure that the capacity of the MIS to support and grow with the organisation is not jeopardized by a lack of appropriate skills. Leveraging consultants for discreet tasks, using local support services that can be accessed when required, as well as application support services are alternatives to building internal capacity. That said, providing professional development opportunities for technical staff is mandatory due to the rapid changes in technology and their desire to keep their skills up-to-date.

### 6.1 Training

Providing technical training to employees of the MFI can be a major responsibility for the MIS department. Topics of training courses may range from computer basics to training senior management on the potential of technology to keep their understanding recent, as well as advice on how to achieve business goals by leveraging technology or making IT decisions. Technical training needs are likely to be constantly evolving and in demand, and therefore should be addressed as part of the HR training function. Depending on the extent and frequency of training courses, trainers may be identified from existing IT staff or out sourced. If internal staff is utilized, care must be taken to ensure that those with the technical understanding also have the necessary skills for imparting this knowledge to others. It should not be assumed that all IT workers make effective trainers.

Timing allocated to technical training must also be realistic to take into account different capacities to absorb technical concepts. Scheduling of training should give users time to consolidate their learning with practical experience, possibly using follow up courses or distance learning methods rather than just intensive training sessions. The importance of investing the necessary and appropriate resources into training should not be underestimated given the direct link that it will have on the quality of information held in the MIS.

Training may not only be required at the operational level since management's understanding and awareness of technology may vary considerably. Management should fully understand the system and ensure that their ability to manage is not compromised by their technical understanding. Management training will also help ensure that ownership of the MIS lies with those that depend on its information, namely the business managers. Perhaps the most important aim of investing in management technical training is to ensure that technology becomes firmly integrated in the organisation with recognition of how IT can help accomplish existing business goals and objectives as well as identify new opportunities.

### 6.2 IT Staffing

The ability of an MFI to attract IT staff will depend both on the market availability of IT professionals as well as competition for these skills from other employers. Competing with private sector salaries may be beyond the means of many MFIs but some effort to recognize the competing salary scale may help both attract and retain staff. In many instances IT suffers from high staff turnover and efforts made to ensure job satisfaction can help reduce this rate of turnover. Although the loss of any experienced staff can be detrimental to an MFI, loss of an experienced IT staff member can leave the organization at serious risk, particularly where

systems are not formally documented. Ensuring that MIS responsibility and knowledge is managed to avoid over dependency on a limited number of staff members ensuring that systems are well documented can help to protect against such risk.

Outsourcing IT responsibilities may be a practical solution for MFIs that are not able or willing to build up an IT function that can address all of their needs. As with any outsourcing agreement however, care needs to be taken in selecting a supplier, negotiating a service-based contract, and maintaining the relationship. Regardless of the extent of outsourcing, there will still be a need for some level of technical resources within the MFI to identify requirements, negotiate with suppliers and monitor their level of service.

### **6.3 HR Information Systems**

In light of expanding staff numbers, if not already present, transformation may be an opportunity to equip HR departments with a system for personnel records. Whether this is an off the shelf application or developed in-house, it should provide the necessary functionality to track and manage personnel, possibly including competency profiles, performance history, training, salary, benefits and personal information. Additionally, payroll functionality should be available either as part of the HR information systems or through the MIS itself.

## 7. Lessons Learned

There are numerous issues that may arise during the MIS transformation process, some of which are discussed within this chapter, and others that may be specific to a certain MFI context. The key lessons learned through the process in Uganda include:

- Ensure all senior management own and lead the decision making process regarding the MIS upgrade initiative. The organization as a whole must buy into the vision for the MIS and not view it as an IT project. All costs must be sufficiently prioritized and evaluated to determine the economic value added for the investment.
- Importance of establishing clear requirements for the MIS pre- and post-transformation. This should be achieved through consultation with all stakeholders and consider both short term and long term impacts of transformation.
- Ensure Central Bank guidelines are finalized before starting any software modifications. Also definition of terms used within regulations should be clarified with the regulators to avoid any errors during interpretation.
- Mapping out and planning the activities required for an MIS upgrade project will help to ensure that the transformation process is not held up by any 'forgotten' requirements and that management is aware of the extent of work required to transform the MIS.
- Preparation of IT and MIS documentation should not be underestimated in terms of time or resources required. Multiple inputs and revisions may be required where documentation raises policy issues that must be addressed at the organizational level.
- Arranging suitable housing for hardware, particularly when teller services are being established, should not be underestimated in terms of timing. Renovations, stabilizing electrical sources and networking involve reliance on external suppliers that may adversely affect the MIS transformation plan; therefore it is critical have contingency plans and to initiate these steps as soon as possible.
- Telecommunication alternatives are constantly evolving and becoming more affordable over time. MFIs should consider these trends when designing systems so that even if not currently feasible, systems implemented will not limit the flexibility to incorporate additional connectivity as it becomes affordable for the MFI.
- Access to a range of IT skills needs to be available either in-house or through a reliable outsourcing arrangement. Skills should include a mix of technical specialists, business analysis, technical trainers and management with an overall vision for the role of technology in the MFI.
- Dependence on software suppliers to make continual customization changes can slow down the MIS transformation process considerably. Availability of programming capacity in house can help MFIs reduce such dependencies and is especially recommended for the report development function.
- Formalization of systems to support IT capabilities and services should be included as part of MIS transformation. This includes hardware deployment, user support, systems security, IS audit and systems change control.
- In terms of MIS software, flexibility and scalability are two of the most important features to address transformation needs.

See Appendix 2 - Compliance Checklist for a list of MIS issues that should be addressed before transforming to a regulated financial institution.

# Appendix 1

## Project Management Principle



How the customer explained it



How the Project Leader understood it



How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



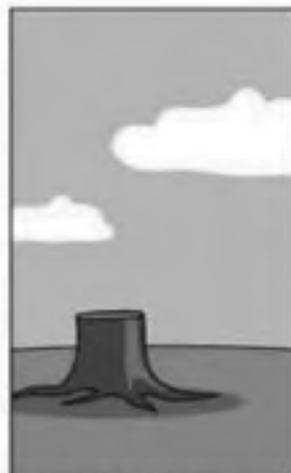
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

## Appendix 2

### Compliance Checklist

Activity	Completed
The CB application requirements have been confirmed as they relate to the MIS	
The CB application requirements have been fulfilled in so far as they relate to the MIS	
The MIS complies with the accounting treatment specified within Regulations	
The MIS can produce all regulatory reports in a time scale that is acceptable to management	
There are no issues with the accuracy of information contained within any of the regulatory reports produced by the MIS	
Back up processes have been identified and tested to ensure that loss/failure of any part of the MIS does not jeopardize the ability of the MFI to meet reporting requirement	
Disaster recovery procedures have been implemented and tested to ensure that loss/failure of the MIS would have an acceptable impact on the operations.	
The necessary operational reports, as identified by management, are available and reliable.	
All new savings products have been fully tested in the MIS, including reporting requirements, and no MIS related issues are preventing their availability.	
The capacity of the IT department is sufficient to support and maintain the MIS in a controlled manner.	
MIS security has been deemed sufficient, with appropriately designed controls, as verified by internal audit/ management	
Procedures have been established and tested for system change control. System updates and changes will not jeopardize the availability of the MIS.	
The MIS has taken into consideration predicted rates of growth and has the scalability and flexibility to support the MFI for at least the next 5-7 years.	
Users of the MIS have received sufficient training and are fully aware of how the system should be used or have a clear path for becoming properly versed.	
An IT governance structure has been established with clear means for vetting technology choices	
Communication procedures have been established between the IT department and management to facilitate a regular exchange of information to ultimately ensure that IT and business strategy are well aligned.	
Any e-banking/delivery channel initiatives either in place or being considered have been properly sequenced so as to not adversely affect the availability/reliability of the MIS during the transformation period.	

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