SOFTWARE IMPLEMENTATIONS: WHAT HAVE WE LEARNED?

by Normand Arsenault and All

"We've traveled the world during the past few years, assessing infrastructures for Information Technology (IT) organizations for Fortune 1000 companies and new upstarts that have become the major portals to the Internet with market caps worth billions…."

"The fascinating common thread we found in these organizations was that they were asking for help to solve technical issues and we found non-technical problems. The majority of the organizations were doing a fair job with the technology. Their problems centered on people and process issues."

Extract from the Book "IT Organization – Building a Worldclass Infrastructure" by Harris Kern, Stuart Galup, Guy Nemiro. -Prentice Hall

What is in the core of any successful software implementation? This article reinforces the general point that technology is not the problem and that the main issue is about people, processes, and organizations. When people think that technology is the main concern, a lot of money is wasted on technical solutions - business is good for some vendors and IT experts - while users[1] continue to use their manual systems and suffer from poor reporting.

To build an efficient and effective management information system, MFIs should do a quality needs assessment and then build MIS around their needs and not fit their needs into some end technological product. MFIs need to focus on the functional side and then look for a suitable solution. Often MFIs skip some stages of this process and jump too quickly to software selection or development missing opportunities for more efficient MIS.

As the Microfinance Industry continues to mature, software products continue to evolve and provide better features and flexibility. Despite all the improvements, many MFIs still have poor information systems as can be seen in rating reports available on the CGAP's Microfinance Rating and Assessment Fund Web site.[2] What went wrong with some software implementations? To implement a successful information system, MFIs need to adhere to the following step-by-step process:

[1] Information system users are: operational staff (tellers, data entry staff, loan officers) accountants, internal auditors, supervisors, management, board members and finally external users (regulators, donors).

[2] The rating reports are available on CGAP's website at: http://www.mfirating.org.

Insufficient needs assessment is the most frequently cited cause for failed IT projects. Many MFIs do not know what they need, nor do they understand what an automated system can do for them. If users don't know what they want, they will not know what to automate. A comprehensive needs assessment is required for all MFIs before selecting a MIS.

A participatory needs assessment phase includes the writing and analysis of:

a) Simple functional information/work flow descriptions

b) Simple key functional, technical and vendor requirements specifications

c) Quick review of organizational structure and staff capacities to carry out the project

With the support of a skilled consultant, an MFI can write the functional information/work flow descriptions in about two weeks. Then it takes about one week to write the key functional, technical and vendor requirements specifications and, if applicable, the request for information (RFI) and the request for proposal (RFP) to be sent to software vendors/IT providers.

There is a difference between a functional needs assessment and an IT needs assessment. A functional needs assessment covers information/work flow descriptions and functional requirements specifications (client information, products features, portfolio tracking, methodologies, reporting, etc.). An IT needs assessment focus on technical requirements specifications (hardware and operating system, database solution, networking and telecommunications infrastructure, etc.).

Writing the functional information/work flow will be a great opportunity for management to streamline the processes and eliminate any steps that are unnecessary. With this tool management will be able to compare what they need with the capabilities of whatever system they are evaluating. It is the first and most important step to be carried out before even talking to a vendor.

Identifying the "Real Issues"

Some MFIs hope that the software they are buying will fix their work flow problems. No software applications will fix existing information/work flow problems. Trying to implement a software application may only lead to the situation worsening. If the system doesn't work manually first, then there is no use to try to automate any part of it.

If portfolio reports and accounting don't balance, the problem needs to be identified and solved before considering the purchase of any software applications. When MFIs or donors have decided to implement a software to improve a situation or fix some problems, preparing a quality

needs assessment will help identify the “real” issues and help find the appropriate solutions which may not at first include the installation of a software.

What are the proper sequences to implement software? One common belief is that MIS is equal to software, which is not true. Many MFIs wrongfully use the following sequences:

This sequential order is obviously wrong, but it is too often followed by many MFIs.

Writing information/work flow descriptions will also help management to determine what activities will be automated and which one will be kept manual. An important part of the information system is manual. Writing information/work flow descriptions helps to define clearly the methodology and training necessary for the success of software implementation.

Writing the requirements specifications will help to ensure the software will meet the business needs of those who will use the software. For example, MFIs managing group-type loans will need features such as rapid bulk entry of group-based transactions and tracking group loans at the group level or at the member level.

Completing the needs assessments phase properly will also help management to design the proper information system, address problems, inefficiencies, and organizational issues early and finally get adequate project funding. It will also serve as a basic reference guide during implementation and development.

Buy-In From the Users

Buy-in from the users may be ensured mainly by having them participate fully in the needs assessment phase. Each department from the organization should participate in the needs assessment activities with representation from both management and line staff. It is important to engage each discipline in the process to ensure a buy-in for the project at all levels. The process should involve everyone who will be a user, or in any way affected by the result.

Users may talk about the system in the form of complaints. Something like, "Our system can't do X?" or, "I wish I could get better information, but the system can't create the reports I need," or, “I can’t get the information on time”, or, “Getting the information is too difficult”, or, "The loan officers don’t use the system as they should. They are still using their manual systems”. And worst, the manual systems may differ from one loan officer to another or from one branch to the other creating inconsistencies and making it difficult to consolidate data or to enforce internal controls.

The information needs of MFIs change with time. A proper needs assessment is the basis for change management which is required because people tend to stick to their usual ways of doing

things, and even if a new solution is better, it is not by itself a guarantee that it will be used. [3] Whatever the approach, by focusing first on organizational needs, the risks of imposing an inappropriate technology-led solution can be reduced. By focusing on the relevant business issues instead of technology, the drive for investment will be led by management rather than by technologists. If employees feel that management support is weak and that the choice of the new system is mainly the IT department's decision, staff buy-in will be low. Top management buy-in and directive is very important.

Reporting Requirements

When the reports do not address management needs (also sometime the management itself is not aware what reports they should ask for to help them take informed decisions), usually the institution is weak in operational and financial management. During the years MFIs' practioners found that sometime it is useful to start manual (read Excel) files for loan tracking system and accounting and evolve toward electronic systems. Simplicity is sometime the best way to address the most complicated aspects of financial institutions management. Relevant, timely and accurate information is the basis for successful operational and financial management.

A simple model for reporting requirements will help MFIs managers to design helpful:

- *Accounting reports* generated by the Accounting System which has codified rules and principles - GAAP or IAS or local standards.
- *Savings and loan tracking reports* generated by the Savings and Loan Tracking System which is a transaction processing system and has no such framework or set of universal standards as features depends on products, procedures, policies and organizational structure.
- *Managerial reports* generated by the Management Reporting System which is a spin-off or variant of both the ongoing Accounting System and the Savings and Loan Tracking System. Managerial reports can be refined over time, through various stages of maturity.[4]

Technology people generally focus on the technical, not functional, side of the product. This focus is helpful, because management need to understand the technical issues. But that doesn't mean technology people should control the entire process: the selection, design, controls and implementation activities. MFI management should partner with the IT people leading the

[3] "The information needs of an MFI change with business needs and new opportunities, as they arise. Also, they must adapt to a rapidly changing environment and growth in order to reach sustainability. This change in needs is furthered as these MFI users gain knowledge, exposure and experience about their businesses. This is quite unlike a bank, where the operations do not follow a "…learning curve". This is one of the reasons why banking software hardly fit the microfinance industry. But that's another story."
Source: MIS-conceptions in microfinance by SRN Raju, JavaSoft Technologies.
http://www.i4donline.net/issue/jan04/mis.htm

[4] Various software applications can be integrated as needed for processing and final reports.

technical side. The MIS functional needs assessment is a great tool to help the management lead the entire process. It may also be the ideal tool to create a functional 'feedback loop' so that the people who are using the system can relay issues/problems back to the MIS developers and thereby address issues that arise while using the MIS. For example, the needs assessment can be helpful to improve the information system in branches, as in some MFIs the system is pretty good at head office but is inefficient in branches where most of the staff still use their manual systems.

One of the most significant challenges in the information technology function is the level of transparency of systems i.e. the degree that a system's design is visible to management. With closed systems, MFIs must rely on software and service providers. MFIs need modular, highly transparent and extensible systems to meet functional needs described in the needs assessment phase.

Often there is a disconnection between the MFIs core needs and a vendor's understanding of the same and the two talk different languages (one business and the other technical). There's usually no one at the MFI or the vendor who can bridge the gap. MFIs can avoid this recipe for disaster with the help of a skilled consultant who knows both functional needs and information technology, understands the language of the vendor and can ask the right questions.

If management doesn't know what they want, the vendor or IT specialist will be happy to determine it for them resulting in products that don't have the required features and flexibility or ones too complicated and expensive to implement. In either case, MFIs end up with frustrated users. It is essential that a proper needs assessment be completed and requirements be prioritized in order to match the appropriate software product.

The ideal MFI information system is unattainable. Many software projects have failed because developers have tried to respond to everyone's needs (i.e. the scope of the project is too large). The best microfinance software does not exist. What is best for one user may be just barely acceptable—and perhaps even a disaster—for another. Every user has specific and unique needs, and only by carefully evaluating them, then examining the pluses and minuses of the available products, can a user begin to match requirements with product capabilities and prepare an implementation plan that fits the organization. There are always trade-offs involved in incorporating certain functionalities into any MIS. The MFI while making the strategic and operational decisions, make them such that it balances and selects the appropriate trade-offs between the "must haves" and "nice to haves" against defined timelines.

Cost is not such an important element as it is perceived. The major part of the cost is often not from the software but from the high-end technologies on which it is running and overselling of high-end technologies not appropriate for MFIs is a real problem in the microfinance industry. Case studies on various solutions used by MFIs would be very useful, for example case studies on MFIs using different tools: downsized full-scale banking software, off-the-shelf software created and tested from the ground up in microfinance institutions, self-developed software, simple peer-to-peer networks, client-server networks, SQL client/server networks, etc.

The Security Issue

Some software running on simple technologies are relatively inexpensive, secure and very effective. Simple technologies can be reliable and secure. The security built into some software is well-designed and well-implemented. In addition, many software applications have a thorough audit trail built in. It is true that sometimes simple technologies do not offer some of the security options provided by SQL Server and Oracle. However, for the purposes of most MFIs, the differences are not relevant. No amount of software security or hiring of systems administrators can substitute for good internal procedures, strong supervisors, and internal audits. In fact, strong software security can give management a false sense of protection that actually increases the potential for fraud. Note that much of the fraud that has crippled MFIs around the world involves false clients. A loan officer creates fake clients and gets loans approved for them. Unfortunately, this scam cannot be prevented or detected by software.

Using Open Source Software

Using open source software[5] is costly and requires qualified technology experts. Open source is by nature a client-server technology and cannot work on simple peer-to-peer networks. Client-server technology requires setting up user accounts on the server, assigning them permissions, and then setting up the client computers to log on to the server. In many cases, the database server needs to be synchronized with the network server so that the user accounts match. This provides benefits, but it also requires a more technical support and means an MFI may be dependant on technology experts. MFIs will probably need in-house IT experts, who can be costly. Setting up a SQL client/server network[6] requires significantly stronger technical support and is much more costly. Many MFIs may not be able to afford this kind of system and anyway weak infrastructures in the regions where MFIs operates do not support the required networks. With SQL client-server database, MFIs definitively need sophisticated IT experts with good database maintenance knowledge, which can be costly.

[5] Benefits of using open source software in Africa are less than predicted according to a survey done by bridges.org http://www.bridges.org/publications/21 . The key obstacles which characterise the software choice include: 1) management lack awareness of the implications of software choices; 2) staff do not have the necessary skills or time to investigate software options; 3) staff cannot afford to buy proprietary applications or download free/open source software applications from the Internet; and 4) often local procurement channels are not available to provide information and deliver software.

[6] SQL: abbreviation of Structured Query Language. SQL is the international standard language for defining and accessing relational databases. SQL is a language used by programmers to store, retrieve, and access the data.

Learning to Walk Before Running

The MFI has to learn to walk before running, following a learning curve. Some software applications can be operated on:

1. Simple peer-to-peer networks or
2. Client-server networks or
3. SQL Server databases.

First a simple peer-to-peer network will let the MFI learn the basics of technology. Then, when needed, the MFI can install a client-server network. And a few years later, when needed, the MFI can implement a SQL server. With some software applications, this upgrade path can be followed with the same application, reducing costs, complexity, and preparation time. Upgrades can be easily installed without making any changes to the data files. Upgrading to SQL Server is not difficult from a programming perspective. MFIs need scaleable solutions that will grow with them so there needs to be a clean and clear upgrade path.

Trapped by Technology

Some MFIs have been caught in the technology trap. An organization has been caught in the technology trap when technologists control its information system leaving management of the organization without weigh in the decisions about investments in the information system. This situation is costly and very frustrating as most of the money is spent on technologies leaving less money for making available the required functionalities. The problem is a combination of vendors overselling their products and users not understanding the complexity of installing high-end systems, leading to high cost overruns. Some vendors oversell their products through addressing the IT staff as opposed to the functional and program managers. Some MFIs may buy some technologies only for the sake of prestige. Finally the MFI has a high-end technology that is practically useless for operations and management. An MIS needs assessment will help management to focus on their functional needs and gain control of investments in the information system.

Technology experts have many arguments for justifying complexity: scalability, security, integration, centralization, obsolescence, standardization, cost, innovation, etc. that are misleading or simply false. Technology experts sometimes put up systems where the organization managers will depend heavily on them. Functional people have to be careful not to lose control.

A big issue with many MFIs is that they want to develop a custom based solution from scratch because they feel that a) they will get 100% functionality they need; and b) that they will “own” the source code and will therefore not be dependent on an external vendor. Part of the issue here is the plethora of negative experiences many MFIs have had with external vendors. However there are a few vendors who have indeed done a good job in understanding the needs and integrating the software fully into the operations as part of the implementation.

Controlling and managing system implementation goes back to the needs assessment phase. If information/work flow descriptions have been written clearly, then they can be reviewed and re-configured to fully integrate software into MFI operations. Procedures and information can be adjusted so that the system helps the MFI optimize operations. Documentation on procedures and information flows can be prepared and/or adjusted easily. Procedures for month-end reconciliation can be set up, as well as monthly cross-checks necessary for internal controls. Many MFIs do not realize the importance of this step until they are in the midst of difficulties, and then no one wants to start over. If procedures and information are not adjusted, few benefits will come from the new application.

If requirements specifications have been written clearly, then MFIs can identify key requirements that are to be implemented as part of an initial phase. This has to be a commitment by both MFI's management and the vendor. Other requirements could be implemented in any future phases.

There are excellent software applications that were created and tested from the ground up in MFIs. Their maintenance support is adequate and some vendors continually develop and upgrade their applications according to the needs and priorities of their clients. Some applications are scalable[7] i.e. designed to grow with the institutions and handle larger portfolios. Adding new features to some applications (upgrading) can be relatively easy and cheap to implement. Some vendors have an impeccable track-record of implementation of their software application. In a limited amount of time, their clients are able to switch software and operate and manage the application efficiently.

Training and Communication

A savings and loan tracking system cannot simply be dropped into place without extensive internal training and communication to everyone who will be touched by the system, even if only slightly. Management and staff need some kind of explanation, training, or help in adapting to the system. A functional needs assessment may be very helpful in preparing the training and communication material.

[7] Scalability is defined as how well a hardware or software system can adapt to increased demands (e.g. increased portfolio size, new products and services, changes in organizational structure, changes in operations, more flexible or complex reporting). Scalability can be a very important feature because it means that you can invest in a system with confidence you won't outgrow it.

Data Migration [8]

Data migration is very important. One MFI who had implemented a software application was still not able to track its loans solely in this software even after one year – it was forced to run systems in parallel. Another MFI who had implemented the same software required four to five months to manually enter all of their historical payment data. Even then, one of them was not able to rely on the data and continued to track payments in Excel. In some MFIs there are some "ghosts and skeletons" which some employees do not want to bring out. These employees may sabotage the efforts of implementing the software by repeatedly erasing the data, making computers crash etc. Full data migration is the key to successfully integrating a new system into an MFI's operations. Data migration and installation must be done with the vendor's own resources. CGAP has mentioned that often installations done by third parties (i.e. not the vendor staff) have run into problems.

Strategy to Implement the Software

The strategy to implement the software application is important. Most installations proceed in two phases – data conversion and training/implementation. Some vendors have developed a rigorous methodology for the process. The vendor starts by working closely with the organization to select the methodologies most appropriate to their operations. Then the vendor sets the right parameters to match the needs of the organization (i.e. set lookup lists and rename fields as necessary). Next they analyze the existing system and clean up the old data as needed. They then write code and queries to migrate the data from the old system into the application. After several test migrations, and adjustments to the code and queries, they pick a date to migrate data for each branch office. After that date, all new data is entered directly into the application, and the old system is no longer used. All data are migrated by the time the implementation is finished and the MFI never has to operate systems in parallel. This is the best way.

Controlling and managing development of the system also goes back to the needs assessment phase. Functional information/work flows and functional requirements can be updated with the development of new products, improvement in processes, changes in organizational structure, etc. With these tools in hand, it will be easier for management to support requests for modifications and new features with the software.

[8] Data migration is the process of translating data from one format to another. Data migration is necessary when an organization decides to use a new computing systems or database management system that is incompatible with the current system. Typically, data migration is performed by a set of customized programs or scripts that automatically transfer the data.

> *In the past, as CIOs we tended to focus on technology. In today's world, technology for technology's sake will not cut it anymore. We really do have to focus on integrating business with technology. It should always start with, "What is the business value, the business return?" And we should always view technology as simply an enabler to delivering that business value.*
>
> Brian Truskowski, Vice President and CIO, IBM, December 2006[9]

For some MFIs, it is time to return to basics, which is to adhere to the step-by-step process described in the introduction:

The process can be used by MFIs that intend to buy software or wish to improve their existing information system.

The key issues to a successful MIS implementation are:

1. **Sufficient and quality needs assessment** i.e. writing of the information/work flow descriptions, the requirements specifications including the reporting requirements, the review of the organizational structure and staff capacities, and the analysis of the "real issues".
2. **Management leadership** in the selection, design and implementation process, and buy-in from the users at all levels.
3. **Appropriate product selection** for the MFI' needs. Avoiding to be trapped by technology. Learning to walk before running. Transparency of the system.
4. **Proper implementation.** Data migration done by qualified people. Capacity to integrate the software into operations.

It's never too late to carry out a MIS needs assessment. Box 1. presents a work plan for consultancy services to conduct such an assessment. By following these steps and addressing the critical factors as described above, MFIs can benefit from a solid information system supporting strong operational and financial management improving efficiency and effectiveness.

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http://isfund.org/view_Consultant.asp?ID=22

[9] Source: http://www-935.ibm.com/services/us/igs/innovation/files/ibmcio_brian_truskowsi.pdf

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Box 1. Consultant's Work Plan "MIS Needs Assessment"	
Steps	**In-country activities/tasks**
1	Kick-off meeting with MFI management. - Terms of reference. - Business plan. Vision, mission and objectives of the organization. Specific issues that need to be addressed. - Management's expectations. Primary benefits the management hopes to gain from improving its information system. Goals and measurable objectives for IS project. Priorities. - Previous work completed. - Technological environment (hardware and operating system, software being used, networking and telecommunications infrastructure, database management) and its maintenance and support. Information about IT staff. - Accounting and product policies/procedures. Staff knowledge and skills in accounting and loan tracking. - Budgetary constraints for information systems implementation, maintenance and optimization. - Key contacts/stakeholders. Organization structure and information system users. - Forming a team to conduct the needs analysis - Risks. Issues that might hamper success of the strategic IS development. - Preliminary work plan.
2	Work with staff of three branches to write and analyse the functional information/work flow descriptions of the branches
3	Work with central office staff to finalize the functional information/work flow descriptions of the branches
4	Work with central office staff to write and analyse the functional information/work flow descriptions of central office.
5	Work with central office staff to write and analyse: - Functional Requirements Specifications - Technical Requirements Specifications - Vendor Requirements Specifications
6	Work with management to carry out a quick review of organizational structure and staff capacities to carry out the project.
A	**To improve an existing system**
7	Assist central office staff to perform detailed assessment of information system using: - Information Flows Descriptions - Functional Requirements Specifications - Technical Requirements Specifications

8	Assist central office staff to improve current procedures and implement new ones.
9	Assist central office staff to improve current reports and implement new ones.
10	Write and deliver the draft final report to the MFI management prior to departure including recommendations to adjust organizational structure and ensure adequate staff capacities.
B	**To select a software application**
7	Work with central office staff to compile a "Long list" (10-12) of appropriate software vendors/IT providers and perform gap/fit analysis.
8	Work with central office staff to compile a "Short list" (3-4) of appropriate transactional software vendors/IT providers and perform detailed assessment.
9	Work with central office staff to write the request for information (RFI) to be sent to software vendors/IT providers Assist central office staff to send RFI to "Short listed" transactional software vendors/IT providers using: - Information Flows Descriptions - Functional Requirements Specifications - Technical Requirements Specifications - Vendor Requirements Specifications Work with central office staff to write the request for proposal (RFP) to be sent to software vendors/IT providers once RFIs are received
10	Write and deliver the draft final report to the MFI management prior to departure including recommendations on most appropriate software and recommendations on how to financially and technically support to selected/identified system. The report will also include recommendations to adjust organizational structure and ensure adequate staff capacities.
Out-of-country activities/tasks	
11	After comments received from the MFI management, the consultant will submit the final report within 10 days of departure from the MFI. The report should include, if applicable, suggestions for future technical assistance to the MFI.
Deliverables	
- Functional information/work flow descriptions of branches and central office - Functional, Technical and Vendor Requirements Specifications - Recommendations to: ∗ improve current procedures and implement new ones ∗ improve current reports and implement new ones ∗ improve current organizational structure and staff capacities - "Long list" (10-12) of appropriate software vendors/IT providers and gap/fit analysis - "Short list" (3-4) of appropriate transactional software vendors/IT providers and detailed assessment - Request for information (RFI) and Request for proposal (RFP) - Draft final report and final report	