Implementing a Computerized Management Information System

By Sasha Peter Orloff
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Why am I writing this?

I am writing the paper I needed to read four years ago.

In 2001, I was working at the Adelante Foundation, which at the time was a two year old micro finance institution (MFI) with just about 1,000 borrowers, and part of my job was to find and implement a workable and reasonably priced way to track and manage loan data. I wanted to use the efficient and useful technological innovations I had seen at my work in San Francisco, California in the grassroots field setting of rural Honduras. It took me, with the help of the Grameen Technology Center, about a year to learn about the different available options. My goal in writing this paper is to save you that year of research and learning time, and to help other MFIs learn from our experiences.

If, in implementing your own MFI you learn other lessons or have other experiences that might be useful to other people, please share that information with me for possible later publication.

About Me

I am a graduate of the University of California, San Diego, with a degree in Mathematics and Economics. I started my technology career in San Francisco, California during the Internet boom of the late nineties working for a company that helped people create small online micro-businesses.

Then I moved to Honduras, Central America, as a tech consultant for the Adelante Foundation. The Adelante Foundation, a Latin American Grameen Bank Replicator, was a small scale MFI looking to grow at a rapid pace and in doing so, needed a more sophisticated system of information control.

After extensive research I found little documentation in Spanish regarding MIS implementations. So I started my own research and in conjunction with the Grameen Technology Center began to investigate existing market options.

At Adelante, we implemented an off the shelf market solution, M2. I then consulted for the Grameen Foundation for their Meso-American Replication Program – a network of seven MFIs who found themselves in needs for a more sophisticated system than the paper trail or Excel spreadsheets that worked so well upon program initiation.

From 2004 through 2006 I will be studying International Business Strategy at the McDonough School of Business at Georgetown University. You may reach me at sashaorloff@yahoo.com.
Who is This Paper Written For?

This paper is for you if your micro finance organization has reached a point where current operations are restricting the potential to fulfill your mission statement. This may happen when your organization has a few hundred or a few thousand borrowers, and the initial paper system is becoming cumbersome. You may also want to read this paper if you are about to start a MFI and want to begin with a workable management information system (MIS). If you are a larger MFI with a MIS system you are unhappy with, I hope this paper will give you hope to try a different option and not lose hope that the benefits of an automated MIS are important and feasible. I have tried to de-jargonize this paper to make it accessible to people without extensive technical backgrounds, but I have tried to include enough specific information to make the paper useful to people with strong technical backgrounds as well. This paper is for executive directors, tech people, board members, consultants or anyone interested in learning more about the benefits of an automated MIS in a micro finance institution.

My goal for this paper is that after you read it you will know what you need to know to choose and install an appropriate and affordable MIS solution for your MFI.

Why should a MFI implement an MIS system?

Information is the core of all businesses, especially MFIs. Manual or automated, a good information system is absolutely necessary. But what is a management information system? A management information system is a way to capture raw input data and transform it into a meaningful manner for management reporting and data manipulation. If an organization can have the necessary information in a timely manner then managers can make informed decisions in a consistent manner to fit into the executive director’s future strategy and decision making. Here are some reasons your MFI might want an MIS:

- To find information easily and quickly. If it takes you more than a day to count how many clients you have, you need a better MFI.
- To increase productivity if your employees. If your field staff are handling as many clients as you want them to, you are fine. If you want them to be able to manage more clients, you need a better MFI.
- To know exactly how much money should return every day, and where it came from, so that you can identify and avoid employee theft.
- Decreasing the need manually to duplicate information within the organization.
- Decrease human error while manipulating data.
- To have the information you need to support strategic planning.
- To increase future productivity and branch capacity with the same number of employees.
- To increase each credit officers’ credit portfolio while reducing transaction costs.
- To ensure consolidated, complete, accurate organized information for management or donor reporting.
- To streamline operations to avoid duplicating work.
- To decrease information turnaround times when trying to make management decisions, analysis, reporting or auditing.
• To secure organizational information to provide safety in case of natural disasters, misplaced files or unavoidable, accidental damage
• To protect the client’s personal, historical and current information

Getting Started

Bad information systems take a long time to produce meaningful reports and typically store data that should be together in various areas, require manually recopying information and is vulnerable to potential threats like natural disasters or malicious employees. Good information control allows an organization to operate more effectively, more efficiently, and help reach their fullest potential with minimum resources incorporating greater control and reliability by reducing the duplication of work and providing managers the information they need in a timely manner.

An MIS solution is a tool to improve operations and not a solution to solve problems which might exist in an organization

A good MIS will not prevent an employee from stealing but will help discover where the organizations controls are failing and allow managers to handle the situation appropriately. Having a huge, robust, banking software in small to medium sized MFIs is typically unnecessary as today’s technology allows affordable solutions with considerably less effort. With this article you should be able to install an affordable MIS.

Getting Started Checklist

Ask yourself these questions before beginning your MIS odyssey. The answers to all of these questions should be yes.

1. Do you have the support of the Board of Directors?
2. Do you have the support of the Executive Director and other significant managers?
3. Do you have somebody capable and committed to carry this project through to completion?

It is important to know that everyone involved in the decision is aware of the goals for implementing an automated MIS. What could be an intense commitment can involve severely modifying current institution processes, information flows and employee roles and responsibilities. It is recommended to have unilateral support from the onset to avoid problems going forward.
Preliminary Investigation & Analysis

Where is my organization right now?

The process begins meeting with the management team to discuss the following issues:

- How soon until an automated MIS is absolutely necessary?
- Do I have the capabilities in-house to implement an MIS or do I need to hire somebody to lead this project?
- Am I open to the possibility of adjusting my program to fit the needs of an off the shelf solution or do I want my organization to continue running *exactly* as it is now (i.e. custom solution)?

The specific answers to these questions are necessary to start developing a timeline. A balance between delaying the MIS benefits to assuring a successful implementation should transition to budgetary concerns. A higher budget will allow greater flexibility in choosing your hardware (computers, network equipment, etc) and software (computer programs) but it should not be a deciding factor when deciding whether to move from a paper system to a computer system.

The three basic options an organization needs to decide among are
1. A customized computer system,
2. An off the shelf computer system that allows for partial customization or
3. An off the shelf computer system that does not allow for any customization.

A customized computer system can be compared to purchasing land, designing a home, building a home and then decorating that home. It involves extensive work and requires more time and effort, but should result in meeting your every at a considerable cost. An off the shelf system can be compared to moving into a home already built. You will need to decorate and can customize certain features, but the basic infrastructure is already in place. For the purposes of this paper I will ignore the option that does not allow for any customization. This option will be for an organization that has not yet launched operations and allows for the flexibility to fit into a program without limitations. The two I will focus on will be a custom solution and an off the shelf partially customized solution. A custom solution requires computer software developers to analyze the organization and create a personalized computer program specifically for that organization and that organization only. It will be custom tailored to those organizations needs, similar to designing and building a house from the foundation up.

*A custom solution should be considered if:*

Your organization has well defined in its processes that are not expected to change in the foreseeable future and has secure budget to cover development costs in case of future adjustments or maintenance.
An off the shelf but modifiable solution should be considered if:

Your MFIs foresees some type of future change, such as adding new loan or savings products, or one that is not yet self sustaining should opt for an off the shelf solution. They come with specific features you can choose to use or not use, and tailor (to a certain extent) for personal needs and in doing so are created for various types of organizations typically providing the flexibility to make changes as the organization grows.

Groundwork Considerations

The main concerns when considering whether to purchase a packaged MIS system or a custom system are:

1. **Functionality and Usability**
2. **Reporting Needs**
3. **Budget**
4. **Customer Support**

Functionality and Usability: A typical myth about MIS systems is that bigger and more expensive is always better. Many large scale banking operations use software that lack the flexibility offered in off the shelf systems. That, combined with the costs usually price these options out of budget for newer and younger MFIs. Some the cheaper solutions on the market are not only much more affordable and flexible but also can address the needs in the organization.

To understand the flexibility of your organization create a chart illustrating the flow of information from when the client first received her credit through the last payment of loan cycle including every possible deviation from the norm. This will assure that although all employees should know each step in the flow chart, no confusion from forgetting a step can arise.

From here needs and informational breakdown become obvious from potential threats to the organization like incorrectly completed paperwork, human error, or even theft. From this analysis focus from which link in the flow chart rests the greatest need. Some important questions that need to be addressed are whether the off the shelf solution:

- Has the capability to handle the organization’s loan products? Savings products? Other new products such as insurance, deposits, interest bearing accounts?
- Can provide the reporting for management donors, government regulations, and board members?
- Can capture all the desired client information?
- Can provide versatility to support the organization’s expansion?
- Can comply with any government regulations?
- Can fulfill the loan tracking and the accounting needs?
- Can offer customer support to fit the needs of the MFI?
These questions are not an exhaustive list but a good starting point for conversation. In an organization that does not anticipate changes to loan details (length, interest, etc) or new products (loans, savings, insurance, etc) a customized solution is the best choice. Once created it cannot be easily modified if the institution undergoes some change. This is because modifications to the program typically involve scheduling computer software developers to come to the MFIs head office to discuss changes, install the changes and test those changes. This can be costly and include airfare, lodging and billable hours. The flexibility of a prepackaged solution for organizations undergoing even occasional minor changes will result in less dependence among external support. Additional benefits arise from a prepackaged solution you can feasibly begin credit tracking the same day you purchase a license whereas a customized system may require months before credit operations commence within the system.

**Reporting Needs:** There are two specific reporting needs important in micro finance institutions. First those necessary for daily operations such as daily transaction logs for reconciliation and credit payment schedules for clients or disbursement authorizations for controls. Without these reports the daily operations of the MFI could not continue. Most packaged solutions come with pre-existing reports and can even offer the ability to create additional reporting needs specific to the organization. For example Southern Horizon’s prepackaged solution Microfinance Manager (M2) outsources customized reporting needs to secondary programs like Crystal Reports. Crystal Reports is a report writing program that allows a database friendly user to customize reports specifically to meet the needs of the organization. With this flexibility the user can create reports in-house at their discretion without having to outsource reporting to costly third party vendors. The second reporting needs are those required for management, donors and government regulators. These reports could involve statistical program analysis for loan delinquency or portfolio management. Most programs should come standard with the CGAP recommended MFI reports. The current list can be found on the technology section of CGAP’s webpage located at [www.cgap.org](http://www.cgap.org)

**Budget:** Unfortunately budgetary constraints are the substantial reason a computerized MIS has not yet been considered. Purchasing equipment, coordinating shipping to the office, configuring the network, and maintaining the effort comprise serious up front costs in a low cost structure. The first question usually is, “So how much does it really cost?” Estimating actual costs is difficult because each organization has different needs and is affected by different geographic variables. For example, an organization in California might have access to a wide variety of computers whereas an organization in a rural Honduras will have to pay high import taxes and/or have very limited selection of computers available. As this is beyond the control of the organization I will focus first on the basics:

1 – Computer with an operating system of Windows 2000 or recent
1 - License of the software solution you choose, like M2
1 - Printer

For a small FMI, that is all. Really. There is other equipment that helps create a better information system, but these three items are the only crucial pieces in a computerized MIS. Depending on the size of the organization needs are roughly one additional computer for every 1500 daily transactions.
Customer Support: Customer support provides a good resource and reference for when you encounter a problem you cannot solve on your own. Customer support includes anything from telephone support (questions and answers), email support, website support or in-house technical support. Careful consideration to determine the value of customer support include reliability of the help, turnaround time in case of emergency, and how long your organization can carry on with daily operations when faced with system downtime. In packaged systems the worst case scenario is to reinstall the system and reload the database with the backup copy. This plays an important advantage compared to customized systems as they can involve a simple phone call (international rates will typically apply) or possibly arranging a trip visit from software experts that can take up to weeks to fix and test. Know your options and carefully weigh worst case scenarios when considering which type of MIS system to choose.

Case Example: Both the Adelante Foundation of Honduras and Alternativa Solidaria of Mexico began implementation of Southern Horizon’s MicroFinance Manager (M2) to manage their credit portfolios around the same time. In the time it took Adelante, with approximately 1000 clients to configure, upload and begin operations using the system, Alsol had not passed the initial configuration stage. Lack of access to support networks and experienced staff the project delayed the implementation process. When I joined Alsol as an independent consultant we successfully implemented the software in 5 months time to daily working operations. Having access to answer questions and clarify questionable issues is important from the beginning.

Case Example 2: After three months of operations of M2 with Alsol of Mexico, a conflict from upgrading Windows 98 to Windows 2000 unintentionally caused the M2 database to lock. Without access directly to the database all computer operations came to a halt. With Southern Horizons support agreement and instant internet communications via messenger we were able to recover our database and continue operations within 4 hours time. Although Alsol did lose 4 hours time due to reliable access to support networks they were able to recover the database without losing a single transaction. Without support it would be impossible to estimate lost employee time as well as falling behind on operations, bank reconciliations and the ability to generate new credit paperwork and approval.

Advanced Network Considerations

Servers: A server is a special computer used to store information, like a warehouse. It is generally used as a stand alone computer containing larger than average memory and processor speed. Just as having strong metal file cabinets with locking drawers will protect paper files better than a cardboard box, a server will provide a safe place for your information to be saved if properly stored and cared for. A server should be kept under a weather controlled environment, free from dust and humidity to insure the longest life possible before replacement. This includes air conditioning, away from open windows and if possible in its own room locked from outside access. The advantage if everything is stored and accessed from one location it assures everyone accessing information sees and uses the same data which avoids errors and backing up the data is a one step process. Many computer brands such as Dell, IBM or HP offer special computers called servers but during the initial stages of an MIS any computer can be used as a server.
Aside from the data security and consolidated information, further benefits inherent of a server environment include network efficiencies. This means that from a server you can connect client computers. Client computers ("PC 2", "PC 3", "PC 4" in the image below) are what we think of as standard computers (laptops or desktops) do not need to store information, and instead access it from the server. Each desktop or laptop will need something called an network card which is a special part that allows it to connect to a network. Connecting the computers via a hub or a switch mean can connect all the computers in the office creating a network. A network is simply a communication link among the computers in the office allowing them to share files, share Internet or access each computers files concurrently by way of a hub. A switch is similar to a hub but automatically allocates more speed to the computers currently accessing the network, transferring unused resources away from computers working independently. A hub or switch can have any range of ports (entries) so be certain the number of ports exceeds the number of computers in the organization. As the organization grows you will be able to connect multiple hubs/switches together to expand your network in coordination to the needs of the MIS. When considering a network the options are wireless or wired. For wired networks cable actually connect the computers together. Price differences and physical constraints of the office will determine whether a wired or wireless network make the most sense. In wired networks benefits include faster speeds and more secure connections but require measuring cable distances, exposed wires which are susceptible to physical damage (rots, tripping over the wires, etc) and possibly drilling holes in office walls. In wireless networks benefits include fast setup (plug and play), the ability to move computers without having to adjust wires but currently have speed constraints for data transfer and are more prone to security breaches if not properly configured and subject to performance factors of structural interference and distance constraints of speed.

Source: Microsoft XP Network Support
In this diagram the server is represented by “PC 1”. As you can see there are 3 other personal computers called client computers connected via the network hub, which allow intra-computer communication. In this network you can see they also share one Internet connection allowing all the computers to simultaneously access email or Internet resources.

Universal Power Supply (UPS) with Surge Protection. A UPS is like a large battery backup capable of maintaining the needs of a computer for anywhere from 10 minutes to hours. A surge protector equalizes inconsistencies in electrical current from standard wall outlets. In many developing countries where power surges or sudden power outages are regular occurrences a UPS/Surge Protector combination will protect your computer from potential internal damage due to these voltage fluctuations. These should be considered for all desktop computers, servers, fax machines.

Printers. Printers vary drastically in price from standard ink printers to laser printers. Although the investment in a laser printer is a higher initial investment the savings in lower costs per page printed will save money in the long run.

Case Example: In 2002 I compared HP Inkjet printing costs with those of HP Laserjets to determine whether the investment in a LaserJet would be a valuable investment. Although the prices are dated the benefits are proportionately equal. At that time the cost of the inkjet printer was then $75 and the basic laser printer $250. Holding constant the cost of paper, electricity and time invested obtaining printer cartridges I analyzed the cost per page to determine when the investments costs would be recovered. At the time an ink cartridge cost $34, which could print 220 pages of high quality impressions translating to $0.15 cost per page printed. Adjusting the printing preferences to draft quality impressions I lowered the price per page printed to $0.06 at 600 pages per cartridge. Comparing this to the toner cartridge for a laser printer of $65 I obtained the capacity for 2500 pages at a cost per page printed of $0.03 in a similar draft quality. At the Adelante Foundation in 2002 we printed an average of 205 pages per week. In just the first year alone upgrading from the HP Inkjet printer to the HP Laserjet printer we saved an estimated $348.84. In the first year alone we recuperated the $175 to pay for the printer. Additional benefits included decreased visits to the Inkjet cartridge supplier and employee time. As well toner cartridge tends not to smear, print more pages per minute and can offer the advantage of easier network connectivity as many have direct network adapters.

Backup systems. The benefit derived from a backup system rivals that of any improvement an MIS can deliver. Backup systems provide safeguards from harm in a portable, transferable manner that occupies little space. There are many options of which only a few are present below, listed from the simplest and most affordable to most expensive and difficult.

1. Copy the information from one computer to another over the network connections. This is as simple as a drag-and-drop from one computer to a shared folder in second. This can covers the basic risk if the server is damaged then a the backup exists in the office which will be easy to access.

2. Purchase a CD burner. A CDR (typically called a “burner”) drive is a component that can be installed or attached to a computer allowing CD burning. This drive actually burning any type information onto a blank disk which can be purchased at
most computer parts stores. As this technology is increasingly available can be easily added to existing computers. This option provides an easy and affordable non-automated solution.

3. A removable or external hard drive can be used to create a fixed, dated copy at a regular interval, such as the end of the week. This way there is a permanent, long term, dated copy of information and its developments. There are free programs on the Internet that work as backups and can handle multiple days of data and almost any range of preference. I prefer rapidbackup, which can be found free as a beta version at (http://www.mlin.net/RapidBackup.shtml)

4. Another option is a tape drive. While the other solutions provide a backup at a single point in time, a tape drive is similar to a live copying machine that provides an ongoing backup your database. This option takes away the element of human error which can involve forgetting to perform the backup, losing CDs or simply avoiding the time it takes to backup your system.

There are more options available on the market and developments in technology will open new doors shortly. These four options that can be implemented either solely or in conjunction to one another. I usually incorporate options one, two and three in some combination. Remember that the safety of a system is only as good as the last backup.

Case example : At the Adelante Foundation of Honduras there is a daily backup of the database to an external harddrive copied after the conciliation of the days transactions creating 5 copies each week. The database on Monday is copied to the folder “Monday”, Tuesday’s database to the folder “Tuesday”, etc. At the end of each week there is a backup of all files on the harddrive including important documents, files, images, etc. As well after each loan payment cycle of two weeks there is a burned copy on a CDRW which is taken offsite to the MIS manager’s home. This allows a quick backup for each day of the week as well as a hard copy for each loan cycle on a CDRW. For now this combination of human involvement and automated software worked very well. All copies should be kept under lock and key to insure that if someone steals the server, there is electrical damage or theft that a copy is maintained in multiple locations for quick data recovery or if an error is made you have multiple copies to be able to independently analyze for integrity.

Case Example 2: At Alternativa Solidaria in Mexico we took a different approach. At the end of each days transactions there are two copies made of the database - one CDRW that is left in the office and another that is taken offsite. This is repeated each day (Monday – Friday) for a total of 10 CDRWs. At the end of every month a copy is burned on a regular CD and placed in a historical archive clearly labeled with permanent marker. All CDRWs are kept under lock and key.
First Steps to Implementation

There are many considerations when deciding to implement an MIS system and the first thing is choosing an employee to take charge of the project. This person needs to be in aware of the credit program processes, accounting processes and organizational structure. Familiarity of MIS systems and database operations will provide an easier mechanism when creating reports and paperwork necessary for operations, but with packaged MIS systems these skills are not required.

Speed of Implementation and Data Integrity

This tricky issue needs to start by answering the following questions:

- What are the reasons for implementation?
- When does the organization want to see the benefits?
- What resources are available to dedicate to an implementation?

The faster the organization can implement a system, the better. Conceptual concerns about implementation can delay benefits indefinitely. There are arguments supporting mirroring your current system to the new system for a set period of time or transitioning as soon as possible to the new system so as to not waste precious human capital. Running concurrent operations does grant the safety of a fallback system that everyone is accustomed to but once a successful day’s cycle has been proven, double entering information is a significant loss of time and the lack of commitment restrains back psychological and physical progress. Avoidance reflexes affect problem solving capabilities in a negative manner. If failure is not an option then committing to solve the problem becomes easy, because there are no options to fall back upon. There will probably experience be small problems during the implementation process and there will typically be a solution. Total benefits from a system cannot be realized until every client, every solidarity group and every credit has been introduced into the system. Even one client not in the system sacrifices accuracy of our ability to fully utilize a successful MIS. The greatest benefit of a computerized MIS is not from the efficiency of procedural credit or the comfort that the credit information is safe and accurate but from the ability to access and analyze full, accurate information. A parallel process will be recommended only until confidence in the new system exists and then duplicating work taking away from the productivity of those employees. Leaving old, manual processes (including Excel sheets) and dedicating the organization to an MIS reinforces that the permanent changes improve the organization, and are here to stay.

Data integrity is an important responsibility for the MIS manager, auditors, operations and accounting. Assurance that the information within the system is accurate, up to date, and protected will guarantee the benefits from the MIS today, next week and years into the future. Data integrity is an ongoing process that involves assuring the procedures are being adhered to and that everyone understands the importance the each procedural step, regular data analysis
including reports, database testing, and analyzing outlying values. It is difficult for managers to make accurate decisions if the raw data in incorrect. Related to this is the speed at which you implement the MIS. Rushing data input or not spending the time correctly educated the data inputters can have grave results on the information in your system. Assure that the employees inputting the information understand the importance to carefully enter data correctly the first time through. If there are any, and I stress any, questions or doubts it should be emphasized to ask. What can seem like a simple mistake can require hours, days, weeks or months of future time fixing a problem.

**Case Example** : At the Adelante Foundation of Honduras I implemented Southern Horizon’s M2 product the data inputter made a small error that could have been easily avoided. Not placing enough importance as to why we inactive a client after they leave the program led to over 3 months of cleanup work. The simple task of changing a client status from active to inactive when she left the program was skipped because this person did not understand the importance of this procedural step and was too embarrassed to ask a third time. Months passed by until a simple analysis on client turnover ratio overstated our number of active clients, which affected average loan size, debt per borrower and number of clients per credit officer. In order to correctly identify which clients were actually borrowing money we had to run a series of specialized reports and in the end we had to manually count each of the thousands of records for each client in the system. The cleanup effort lasted over three months and involved the data inputter, MIS manager, Credit Manager, Zone Leaders and the Executive Director and exemplifies of the importance of the attention to detail necessary during the training process and the importance placed on every step in the procedures in data inputting.

**Controls**

Fraud and risk management are not new to any industry, especially not one composed of financial services. Fraud is “A deception deliberately practiced in order to secure unfair or unlawful gain” and risk management is finding an affordable way to minimize these dangers before they happen. Although micro-credit organizations are designed to help end poverty among the world’s poor, cash in hand is a strong temptation. While individual transactions tend to be small the cumulative effect of errors can be disastrous. The minor effect of operational errors or even human errors can be exploited and endanger the institutions financial future. Proper Controls mitigate operational risk by monitoring weaknesses and assuring set processes are being followed. Not every detail needs to be revised, but minimized temptation by increased transparency must be taken seriously from everyone involved in cash transactions or interacting with the computer. This assures that even in the absence of direct supervision proper checks and balances guarantee the clients money is being handled in a responsible manner.
Computer Access Controls: Before granting computer access to an employee I suggest a formal training program, documented and signed, to avoid a misunderstanding of what is permitted and what is not permitted on company computers. A clear definition of roles and responsibilities can include the dangers of computers with access to Internet and the consequences viruses can play in an organization. Formal processes for employee’s computers should include an understanding:

- Users are required to have a secret, personal password in order to logon to the computer
- They are responsible for their computer, regardless of whom using it. With this in mind, recommended logging out when leaving a computer will not allow other users to access privileged information.
- Who they contact for any changes to the computer including additional software, updates to current software or any problems with the machine
- There are dangers involved with Internet viruses (if the computer has access to the Internet) and how to reduce the risk of infecting the computer/network
- when an employee is fired or leaves the organization that the computer passwords will be removed and/or changed

All modern operating systems and most software programs have built in levels of access. An MIS Manager should use of these features to prevent both accidental and intentional changes to programs, computers, networks, internet and routers.

Case Example: At the Adelante Foundation of Honduras every computer was installed with Windows XP and had a master administrator account with the same name and password known by the MIS Manager. Each employee had a restricted access account to use any program complete with network access but users could not install or remove programs. Access to the network was limited only to users who were assigned to a controlled list located on the server. Each employee had a password protected screen saver which would activate after 5 minutes to ensure that if that employee left the room no other user could access the computers files. As well there was a separate login required for each person using M2 with specific levels of access for the accountant, data inputters, supervisors and promoters. This insured privileged information could only be viewed by those who are meant to see it. At Alternativa Solidaria the server was managed by Microsoft Server and each computer was installed with various operating systems from Windows 98 to XP. Although the network was internet ready all browser and internet access programs were removed for fears of viruses. As well each computer was protected with passwords for login and they had different levels of access for M2, depending on employee position.

Transaction Controls: Transaction controls verify that more than one employee is responsible for each transactions that occurs within the institution. From the point a client pays the credit officer to the physical deposit into the bank, good transactional controls will be accounted for by at least two people and ideally involve a receipt. Reconciliation of transactions with accounting software with bank statements creates a fast, easy method to analyze daily transactions to the lowest denominator of local currency. Daily transaction reconciliations signed by a controller or supervisor, monthly bank reconciliations and quarterly data flow analysis are great transactional controls that will assure high data integrity at all times and not
allow unanswered questions to fraud for more than one business day. This assures that the accounting records match the program records and are verified on a regular basis. It is much easier to reconcile a discrepancy that day than weeks into the future. Fortunately most programs should come standard with a daily transaction log which can be verified with cash counts or bank deposit slips at the end of the day.

**Process controls:** Even though process controls are not linked to an MIS it is a very important point and one that deserves mention as long as processes are being modified. Access to bank accounts or cash should not be overseen by only one person, even in small organizations. Each change of hands of cash should be authorized by two people, at least once by the giver and once by the receiver. If both parties sign a paper trail no future questions can arise as to when the transaction took place, the value or purpose of the transaction. This should be reviewed every year with an independent audit to avoid any concerns from lack of transparency.

Analyzing these policies and procedures, access of different staff members, transparency and proper allocation of authority should be done on a regular basis it assure as the organization grows and as employees are promoted that the correct controls are in place at that point in time. Truly honest and dedicated employees will be in favor of organizational reform because they understand that what is better for the organization and its clients are in turn best for them. Incorporating quality controls at an early stage will protect the organization as it expands to future branches and there is less direct oversight among the head office management.

From implementation forward an organization usually fails for one of three reasons: under utilization of software capabilities, lack of understanding how to properly utilize your new information system or frustration from overly complicated procedures. Success is driven by organizational commitment to move forward with a positive attitude and a problem solving leader. If you are aware of these concerns as you move forward through the implementation it should make the implementation a success. An automated software solution should make greatly improve operational efficiency, productivity and performance. As I mentioned at the beginning, information is the core of all institutions. As the organization grows, so does its needs. Continually improving and growing your information system will allow you to adopt to changes faster and not allow information to be the limiting factor in your organizations success.
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