



TECHNOLOGICAL SOLUTIONS

Increase the Outreach of Financial Services Through Expanded and Secure Access

BACKGROUND

For several years, DID partner financial institutions have been using information technologies to process their transactions, do business with their clientele, manage their administrative units and analyze their financial results with a view to making strategic decisions. DID has not only advised several institutions in choosing technological solutions adapted to their market, but has also guided and supported many partners in the implementation of the adopted technological solutions and in their use, improvement and maintenance. DID and its partners have thus acquired over the years confirmed expertise in the implementation and development of technological solutions and in the training and coaching of their users. Through these experiences, DID has been able to formulate key guidelines. These beliefs acquired over the years will serve as a guide to better advise its partners and to optimize the choosing of the technological solutions to be acquired and the strategies to be deployed to meet the needs of the most disadvantaged segments of the population.

In terms of technological solutions, DID places its expertise at the service of the following objectives:

1. To promote access to financial services for the less fortunate segments of the population;
2. To make these services available at a lower cost while rendering them efficiently to the population;
3. To protect the microfinance clientele and institutions by ensuring, at all times and under all circumstances, the security of the transactions and data;
4. To promote effective management of financial assets, good governance and informed decision-making with the aid of tested technological tools;
5. To ensure the sustainability of technological solutions among partner institutions;
6. To enable partners to take control of the technological solutions.

DID's position with regard to technological solutions is presented in three major sections. Here is a description of the sections:

- Section 1 contains the assertions relating to the management of the information systems.
- Section 2 discusses the assertions relating to the technological solutions.
- Section 3 deals with the assertions relating to the technology itself.

The following table lists the topics of the representations.

Table 1 – Topics of the Representations

Management of the Systems	Technological Solutions	Technology
<ul style="list-style-type: none"> • Strategic Aspect of Technological solutions • Integrating the Solutions • Change Management • Investments • Cost/Benefit Payback • Security 	<ul style="list-style-type: none"> • Innovations • Grouping of Technologies • Funding Support and Maintenance 	<ul style="list-style-type: none"> • Software Package (Program Product) • Single Version • Location

1.0 MANAGEMENT OF INFORMATION SYSTEMS

1.1 TECHNOLOGICAL SOLUTIONS ARE STRATEGIC

Technological solutions are of strategic importance for both financial institutions and their clientele, to the extent that:

1. They have a direct and positive impact on operational efficiency, which contributes to reducing the cost of services offered to the clientele and the wait time;
2. They contribute to the standardization of the operations by normalizing the products and services as well as by providing access to the same financial products across all points of service of an institution, taking into account local parameters;
3. They are management tools that help ensure better governance and increased control of the access to information on the transactions;
4. They adjust easily, and at an identifiable cost, to the growth of the institutions;
5. They play a crucial role in the networking of these institutions by linking these institutions to one another electronically, which fosters increased proximity with the clientele;
6. They adapt to the markets and enable the rollout of new financial products and new processes;
7. They enable the modular addition of new systems that are thus integrated to the technological achievements, which avoids the complete replacement of a monolithic solution;
8. They are supplemented by the use of office and telecommunications tools that allow the institutions' clients and stakeholders to carry out their tasks effectively.

The Strategic Aspect of Technological solutions

DID believes that technological solutions are indispensable in handling financial transactions and that these solutions are a key element of the evolving capacity of microfinance institutions.

Several factors are essential to taking advantage of technology: they include the availability of hardware and power sources, as well as the availability of technological know-how.

1.1.1 TECHNOLOGICAL SOLUTIONS ARE INDISPENSABLE

Today, hardware is increasingly affordable and the power sources required for the running of technological solutions are increasingly available. There is no longer any need to install large-scale servers; infrastructures are becoming minimal. The more features become available in hardware such as mobile phones, the broader the scope of the technology and, therefore, the greater the availability of technology-supported financial services for the public.

Increasingly technological advances are now being directed to the general public while, at the beginning of computerization, the systems were reserved for specialists. Knowledge and use of technology is spreading at an increasingly faster rate, whether among members, employees, elected leaders or managers of microfinance institutions. Several technological solutions have become common everyday products. They are now regarded as commodities, just as electricity and telephone service. They are solutions that have become indispensable and there is no longer any need to justify them.

Given these advances, DID believes that every microfinance institution can and should be computerized.

1.1.2 TWO COMPUTERIZATION APPROACHES FOR PROCESSING TRANSACTIONS

The current advances in the field of information technology enable the offer of technological solutions adapted to all types of microfinance institutions, including institutions located in remote areas.

To automate the processing of transactions and render the operations of microfinance institutions more reliable, DID recommends the use of a proven and affordable transaction management system.

Two computerization approaches are available. The choice is made depending on the size, the volume of transactions and the availability of the infrastructures. A microfinance institution can be computerized either with a standalone approach or by using a processing center.

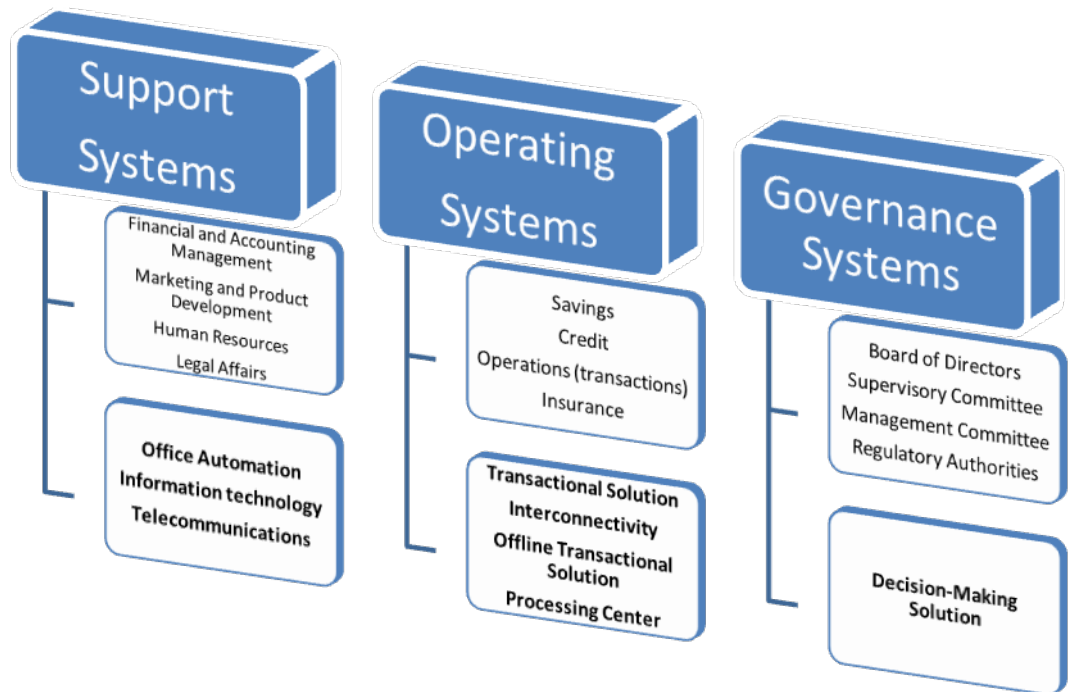
A microfinance institution that uses technological solutions in a standalone mode performs all of its operations directly, without involving other participants. The standalone installation is intended for institutions that have a high volume of transactions and the financial capacity to purchase the required hardware. In addition, an institution computerized on a standalone basis should have at its disposal staff with IT expertise. These staff members can be a part of the in-house staff or be shared with other microfinance institutions.

Institutions unable to use a standalone operating system because it is too expensive or because the infrastructure (electrical power, for instance) is not available or adequate are computerized with the aid of a remote processing center. Computerization at a processing center offers the possibility of computerizing at a lower cost using computers connected to the processing center in a batch mode or via Internet access.

1.2 INTEGRATION OF THREE SOLUTIONS UNDERLYING THE CAPACITY FOR CHANGE

Technological solutions are present at all organizational levels of the institutions. They support the support, operational and organizational systems of the organization. Each of these organizational levels can use one or more technological solutions to meet its commitments and develop its capacity for evolution (Figure 1).

Figure 1 – Use of Technological solutions in the Different Systems of the Microfinance Institutions¹



DID has focused its efforts on three large solutions that are also able to operate on both a standalone basis and an integrated basis. These technological solutions are designed to automate financial transactions, help decision-making and support the interconnectivity of financial institutions.

The implementation of a technological solution for the automation of financial transactions is the first step in the computerization of a microfinance institution. The operational solution makes it possible to automate everyday transactions and the accounting operations of the institutions. It allows managing reliably savings, loans, financial products and services, customer data and the general ledger.

If the operational technological solution first targets the employees of microfinance institutions and entrepreneur financial centers, the decision-making solution is, on the other hand, used by the managers of these institutions. A decision-making system provides the reliable information needed

¹ The division into three major functions comes from DID's TOP 1 2 3 system.

by the managers to make good decisions. Such a system consolidates information from the operating systems and produces financial, management and regulatory reports. A decision-making system can also summarize the information available to the institutions, identify trends based on historical operational data and thus make enlightened strategic decisions.

Because they contemplate different objectives, operational and decision-making solutions have to be distinct. In fact, these solutions automate functions that are different and sometimes contradict the plans of the required infrastructure and performance demanded by the users. While the operational solution must always be available, quick and inexpensive, the decision-making solution, for its part, can be programmed to generate periodic information and accept a timeframe so that all the current and historical information is present, accessible and process. If it is crucial to have at all times an up-to-date current account balance for the operational solution, the value of an indicator, such as return on assets (ROA) for the decision-making solution, can reflect the monthly position.

DID has taken a position in favor of the creation of federated networks that group together microfinance institutions. DID offers an interconnection solution to link these institutions with one another electronically. This interconnection solution may also be used by the entrepreneur financial centers and the processing centers that are not part of federated networks, but which want to share financial services. The use of the interconnection solution, in addition to allowing financial transactions between members and clients of different institutions, also ensures the clearing of transactions between the entities in a network through a central institution.

With the formation of real networks of financial institutions and, in view of the recent technological advances throughout the world, more and more institutions wish to use systems that provide connections between them and the outside world. Indeed, to increase their competitiveness, facilitate remote support, allow the distribution of information and the development of products and services such as mobile banking, branchless banking and e-banking, more and more institutions want to resort to interconnection.

Why offer three different solutions (operational, decision-making and interconnection) rather than a single one that can handle all the needs of the institutions and their clientele? The answer is that a strategy to unify the systems is risky and expensive. Indeed, assuming that one exists, a single universal master solution imposes its rules (and those of the supplier) on all areas of the organization, as well as all of its clients, which complicates and endangers its deployment.

Integration Technological solutions

DID is of the opinion that it is safer and cheaper to opt for the integration of operational, decision-making and interconnection solutions and solutions to support the organization's functions, rather than opting for a single solution able to serve all of the organization's systems.

1.3 CHANGE MANAGEMENT

1.3.1 IMPLEMENTATION² OF TECHNOLOGICAL SOLUTIONS IS A CHANGE MANAGEMENT PROCESS

The culminating point of the implementation of a technological solution is often the installing of new hardware or new software. This event is so well known that people think that the implementation is summed up in that. The study of the impacts of technological changes on the clientele, on the operations, on the management processes and on the institution's systems as a whole is thus sometimes overlooked: functional changes are perceived as acquired since they are supported by the technology platform, to which people often ascribe phenomenal capabilities.

However, the implementation of technological solutions is but one of the steps in the institution's development process. In this connection, an implementation has to be fashioned from the point of view of change management.

Managing the Implementation of Technological solutions

DID believes that the implementation of technological solutions is a change management process that has to be integrated into a business vision supported by a strategic process. It is necessary to address the changes from an operational angle rather than just a technological standpoint.

Since the introduction of technological solutions has an impact on several activities of a microfinance institution (operations, supervision, management, etc.) and it often leads to significant organizational changes even affecting the clientele, DID recommends prior detailed analysis of the impacts of these changes in order to manage them well.

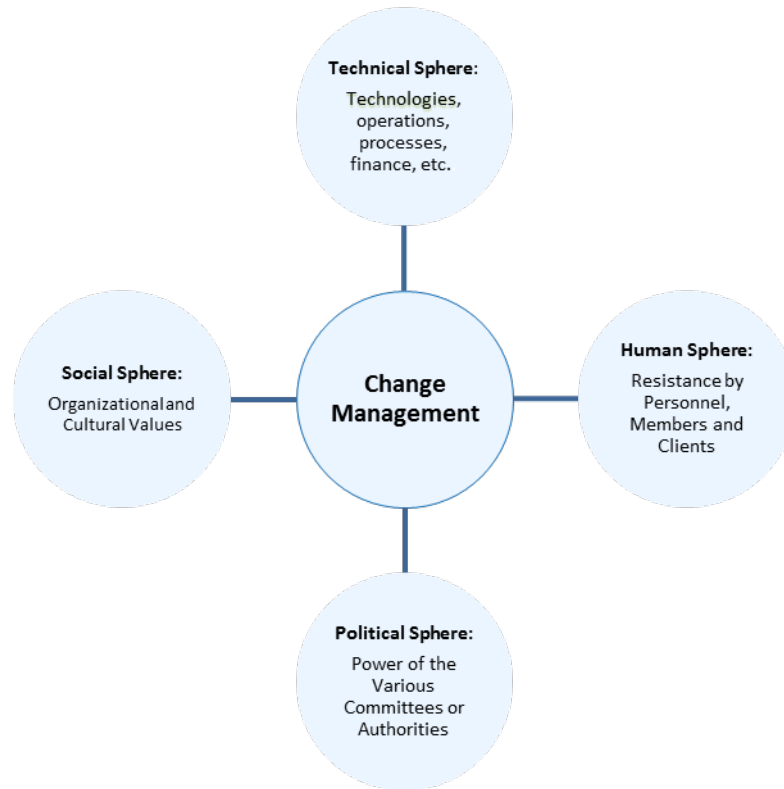
Because an appreciable number of implementation projects fail because of a lack of preparation, DID also recommends a structured process to guide the planning and management of the implementations of technological solutions and to facilitate the deployment of the solutions.

During the many technology implementations it has carried out, DID has time and again found that change management is a critical factor in the success of an implementation. The change affects four spheres of the organization, each of which requires its own management (Figure 2):

- The technical sphere;
- The human sphere;
- The political sphere;
- The social sphere.

² Implementation is understood to mean both the transition from a manual approach to a computerized approach and the switch to a new technological solution.

Figure 2 – Change Management in the Implementation of Technological solutions



Source: *Plan de professionnalisation, Direction principale Développements* ["Professionalization Plan, Developments Division"], June 2008.

The technical sphere involves managing the professionalization-related impacts. The main mechanism to be put in place for managing changes is the formation of an implementation committee composed of local decision-makers, technology specialists and elected leaders, as well as a mechanism for ongoing communication between the teams involved in these implementations.

In the human sphere, which involves adequately managing resistance to change, the mechanisms to be put in place are: raising the awareness of the decision-makers, adjusting the implementations to the difficulties encountered by the staff, justification by the decision-makers that the results expected from the project are greater than the efforts it takes to deploy them, the transparency of the intentions, holding training and coaching sessions appropriate to the lessons to be learned, client-adapted communication and client support when they engage in their first transactions.

The political sphere involves respecting the level of power of the various jurisdictions. The mechanisms for managing change are the development of a good knowledge of the institution's political aspects and the setup of an agreement mechanism with the institution's representatives on the expected results and the impacts of the changes.

The social sphere is concerned with managing organizational and cultural values; identifying an advocator who is a leader in the business area and a forerunner in the use of technologies and systems is recommended.

DID believes that the implementation of technological solutions requires an exemplary orchestration of business issues and technological issues. That is why DID recommends resorting to two types of expertise in the implementation of technological solutions: financial experts skilled in business analysis and financial transactions, whom we will call here “operational”³ and technology or “IT” experts.

Computerization always has impacts on the organization of the employees’ work, on the operational procedures, on efficiency and on customer relations. For this reason, it is necessary to address the implementations from an operational perspective before examining the technological angle. The role of the operational experts in the implementation of information systems is sometimes overshadowed by the fact that technology is often perceived as an end in itself. However, technology is actually a tool, a catalyst of operations that are at the heart of the institution’s effectiveness. DID’s experience shows that the contributions of the operational experts are essential and allow obtaining greater profits.

An important aspect of any methodology for implementing technological solutions is the transfer of expertise. After implantation, the institution’s in-house staff must be capable of using the solution at its full potential, as well as ensuring its sustainability and deployment at other sites.

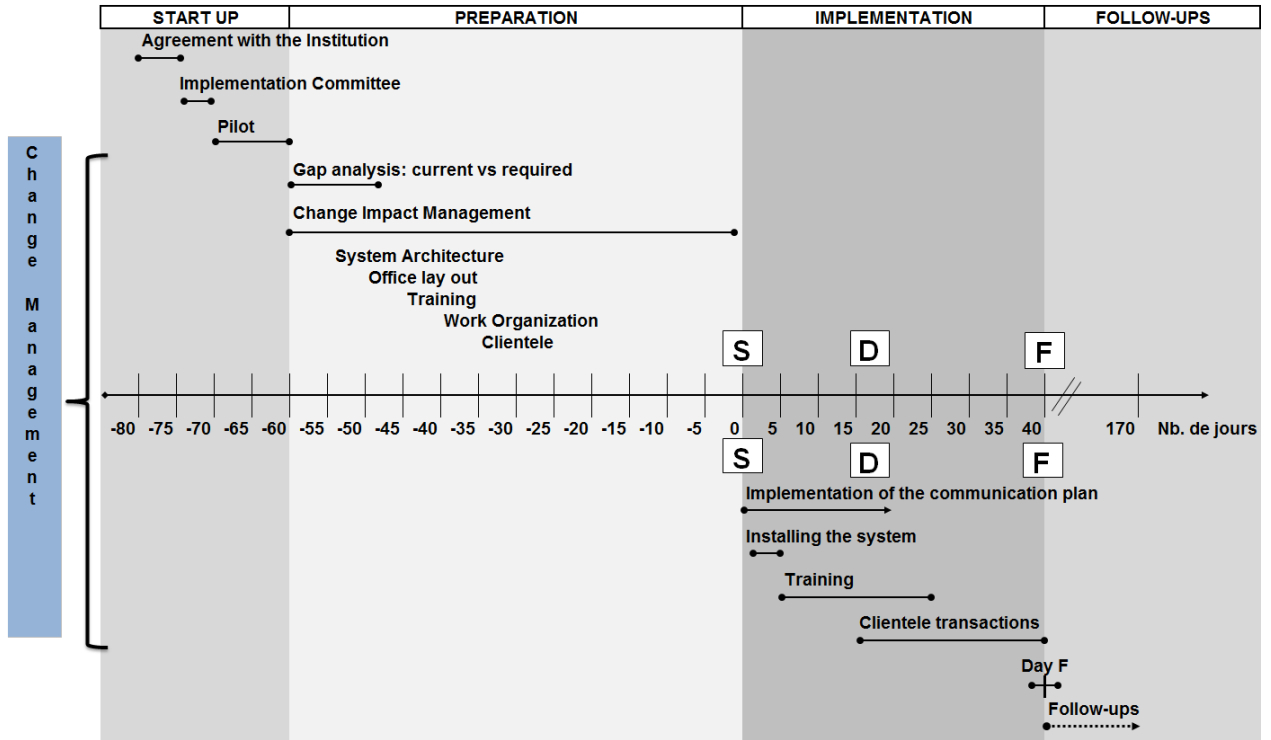
The implementations of technological solutions using DID’s methodology, therefore, involve a team (internal or external) consisting of at least one IT expert and an operational expert. The first step of the methodology is the assignment of an operational expert responsible for the project. He identifies the operational and business issues and sees to the commitment of all the stakeholders required at the institutional level. Coaching the stakeholders, communication with the clientele and user training are all crucial operational aspects for the success of the technology implementations.

In addition, DID advocates the use of pilot projects and prototypes to ensure the adaptation of the solution to the identified needs and its effective deployment in a microfinance environment. For these pilot projects, DID uses agile methodologies,⁴ the purpose of which is to quickly deliver to the participating users simple and adequate solutions that meet their needs. The following figure shows the implementation process divided into four main steps, in which the events of the implementation timeline and the change management activities are located.

³ Sometimes the term “business analyst” is used.

⁴ This “is a group of software development methods based on iterative and incremental development, where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams. It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change”. (Wikipedia).

Figure 3 – Change Management in the Implementation Process



1.3.2 THE CHANGE MANAGEMENT PROCESS SHOULD BE INTEGRATED INTO THE BUSINESS VISION

Technological solutions should be used as a catalyst for change. The implementation of technological solutions is not sufficient per se to put in place the best practices. Technological solutions have to be used as a force that leads to the goal set by the managers and elected leaders.

The implementation of technological solutions is not an end in itself: technology should support a real business need. Behind the desire to introduce any technological change there is a need expressed by the clientele. In the process of business planning, technology is, therefore, a means for reaching a target—a solution to a problem. An IT master plan should be drafted as a first step in connection with the business plan. This plan describes the IT resources and the implementations required to achieve the business objectives pursued.

Once technological solutions have been introduced into an institution, they have to be managed. This is a matter of having in place an organizational function concerned with managing the investments required for the maintenance and upgrading of the solutions. Of course, the more technology plays an important role in the institution’s processes and budgets, the more the change management function should fall within the province of senior management and be part of the major aspects of the institution’s business plan and vision.

1.3.3 THE CHANGE MANAGEMENT PROCESS SHOULD BE SUPPORTED BY A STRATEGIC PROCESS

To ensure the success of the implementation of technological solutions as well as the sustainability of these solutions within the institutions, DID advocates the commitment of local managers and elected leaders in the early stages of development and implementation of technological solutions.

Managers and elected leaders of microfinance institutions know their clients, their market and their staff—a necessary factor in the success in a technology implementation. They must not only take part in the decisions and strategies involving technological solutions, but also exercise their leadership in the face of the changes brought about by these technologies.

Managers and leaders must be capable of measuring the changes brought about by the implementation of technological solutions. They must not only be aware of the costs of implementation, but also put in place means of achieving a payback from the benefits generated by the technology implementations. They must ensure the profitability of the implementations of solutions and the reception given by the clientele to these implementations. They must also monitor and follow up with the aid of advice from technology experts.

New technology-based services must be introduced, not only with the technology experts, but also with the participation of other functions of the microfinance institution (monitoring, operations, financial management, marketing, human resources, etc.), in addition to being coordinated by a multidisciplinary committee. Thus, the processes of analyzing needs, tests and troubleshooting are more efficient and constantly take into account the impact on the clientele.

1.4 INVESTMENTS IN TECHNOLOGY

Technology expenditures occupy an increasingly important place in the budgets of microfinance institutions. It is therefore essential that these expenses be incurred in accordance with client needs and considering the sustainability of technological solutions. This is why technology expenditures should be considered as investments.

Investments in Technological solutions

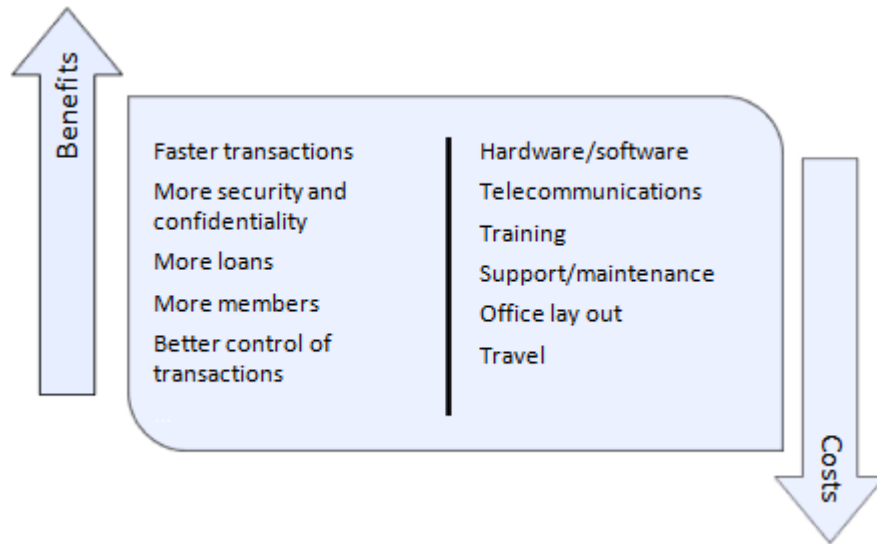
DID recommends that the costs of the IT systems be considered as investments and managed as such.

To do this, assigning priorities, budget planning and structuring IT functions are essential to achieve the institution's objectives and achieve self-financing systems through the payback in productivity gains, competitiveness and delivery of new services.

At the same time the costs are evaluated, it is essential to assess the expected benefits and gains in effectiveness and efficiency brought by the information systems. It is this balance in the cost/benefit analysis that should determine the decision of whether or not to realize a technological project and guide the implementation of the technological solutions. Investments in technology bring benefits to the clients and, in this connection, the cost of the services that results therefrom could be assumed by the users when the service is rendered. The decision to bill the transactions directly to the clients is a business decision made by the microfinance institution.

To properly manage technological solutions, the costs and benefits thereof must be measured properly. "You manage what you measure," goes the saying.

Figure 4 – Benefits Versus Costs of Technologies



1.4.1 MEASURING THE COST OF IT SYSTEMS

The deployment of technological solutions may involve the three following cost categories: set-up, operation and support service. The first is undoubtedly the most obvious, but it is only one aspect of a larger whole. Operations costs (i.e., what it costs to operate the implemented solutions) and the support service costs (i.e., what it costs to ensure the success of the deployments and sustainability of the solutions) are an even greater amount than the sum of the set-up costs.

The set-up costs include the costs surrounding the purchase of hardware and software, as well as software development, where appropriate. They also include the costs related to the installation of the infrastructure of an IT network and the fit-out of the premises. Added to this are the training, adaptation and migration costs. Often, we must also take into account the cost of licenses and warranties. The operating costs are recurring costs. They include costs related to human resources, consumables,⁵ operation-continuity plans and processes necessary for risk management. The service-support costs, for their part, are composed of recurring costs and ad hoc costs. For the recurring part, periodic hardware-maintenance and licensing costs are included, as well as the costs of staff and consumables. The ad hoc costs are the costs for occasional updates and for unexpected interventions in case of a system shutdown, for example.

The difficulties on the cost side are determining who is the payer and the amount payable. Who should bear the IT costs and what portion of the costs (fixed and variable costs) should be paid by a user of IT services? This question is even more prickly when an IT department is shared by several institutions as is the case, for example, for interconnectivity. This exercise of determining who pays and how much to pay for IT resources must be carried out by the connected institutions. These institutions are required without fail to pay a fee to benefit from the consolidated IT services. The rules that allow determining this fee may vary from one institution to another. In the position paper related to the integration into networks, DID observes that *“It is not uncommon for the membership fees strategy adopted to generate a certain amount of equalization adjustment among the collaborating units.”*⁶

⁵ Designates a limited-use item, i.e., that has to be renewed: paper and ink for a printer, for example.

⁶ DID’s position paper on integration into networks, May 2005, *À propos de la solidarité contractuelle* [“Contractual Solidarity”], p. 7.

1.4.2 MEASURING THE BENEFITS OF IT SYSTEMS

The gains arising from the implementation of technological solutions are numerous. Computerized institutions offer their clients faster counter service or self-service and project a professional and leading-edge image. The following figure shows the potential benefits of implementing technological solutions.

Figure 5 – Benefits from Technological solutions



Cost/Benefit Payback of IT Systems

Knowing that it is difficult to measure the benefits of information systems and calculating their payback is even more so, DID believes that the cost/benefit payback should be planned, managed and measured.

There are ways to measure the return on automation. For example, “time and motion” studies quantify the time savings brought about by automating tasks. These gains translate into a better ratio with respect to the number of transactions per teller or the number of loan applications per loan officer. It is up to the institution to assess whether it is actually opportune to reduce the number of staff (tellers or agents) or increase the number of transactions or loan applications processed per staff member. If the institution does not act on these indicators, the payback from the investments becomes illusory.

Some gains, such as improved communication, are more difficult to quantify. Here again, it is up to the institution to choose the indicators to be measured according to its business goals. By always relying on the fact that technology investments should be pegged to the objectives of the business plan, the IT master plan should relate the gain from technological solutions to the objectives of the business plan using the units of measure identified in the cost/benefit analysis of the business plan. Thus, an institution wishing to improve communications with its clientele may, for example, consider investing in the establishment of a mobile early warning system to remind borrowers of the due dates of their payments.

The following paragraphs highlight areas where the institution can get the funds that will enable it to recoup its investments in IT systems.

Computerization lets more be done with less effort. Technological solutions improve the effectiveness of institutions because they release the institution’s staff from long and tedious clerical tasks. Staff then become available for other tasks with a greater added value. So technological solutions lead to an improvement in operational efficiency. In fact, technological solutions help streamline business processes by transforming the institutions into more profitable enterprises.

Computerization improves the institution’s performance. Internally, technological solutions help improve performance and increase the range of possible activities. Externally, technological solutions help create an efficient and flexible platform to communicate with suppliers, partners and even directly with the public. In short, they help to streamline, integrate, draw closer to the clientele and create new channels for the distribution of services.

Technological solutions create electronic protection systems of records and data vital to the clients and the institution. Backup systems, such as vaults, preserve information by controlling access and updating data.

Telecommunications systems authorize remote and offsite access to the institution. This accessibility allows improving the service offering because the transactions are done immediately, at the right time with the clientele, even outside the institution’s premises. This reduces the expenses invested in real estate and travel and makes it possible to offer greater flexibility to the clientele. Technological solutions can be made available at any time of the day or night, depending on client needs.

Technological solutions help make communications less expensive, faster and more efficient. Use of the Web, mobile phones and collaboration tools⁷ make information-sharing instantaneous and more direct.

Technological solutions can also help institutions to attract and retain the best talent. Indeed, the use of innovative solutions increases the satisfaction of the employees and their commitment and loyalty: employees have the feeling of being at the forefront and the institution is concerned with maintaining and increasing their expertise. These factors help create a culture of participation, motivation, trust and common goals.

Especially when business becomes increasingly competitive, technological solutions are also a way to remain at the forefront, if not to stay in business. Good investments in technological solutions can enable microfinance institutions to keep a step ahead of their competitors by offering innovative financial services to a growing clientele.

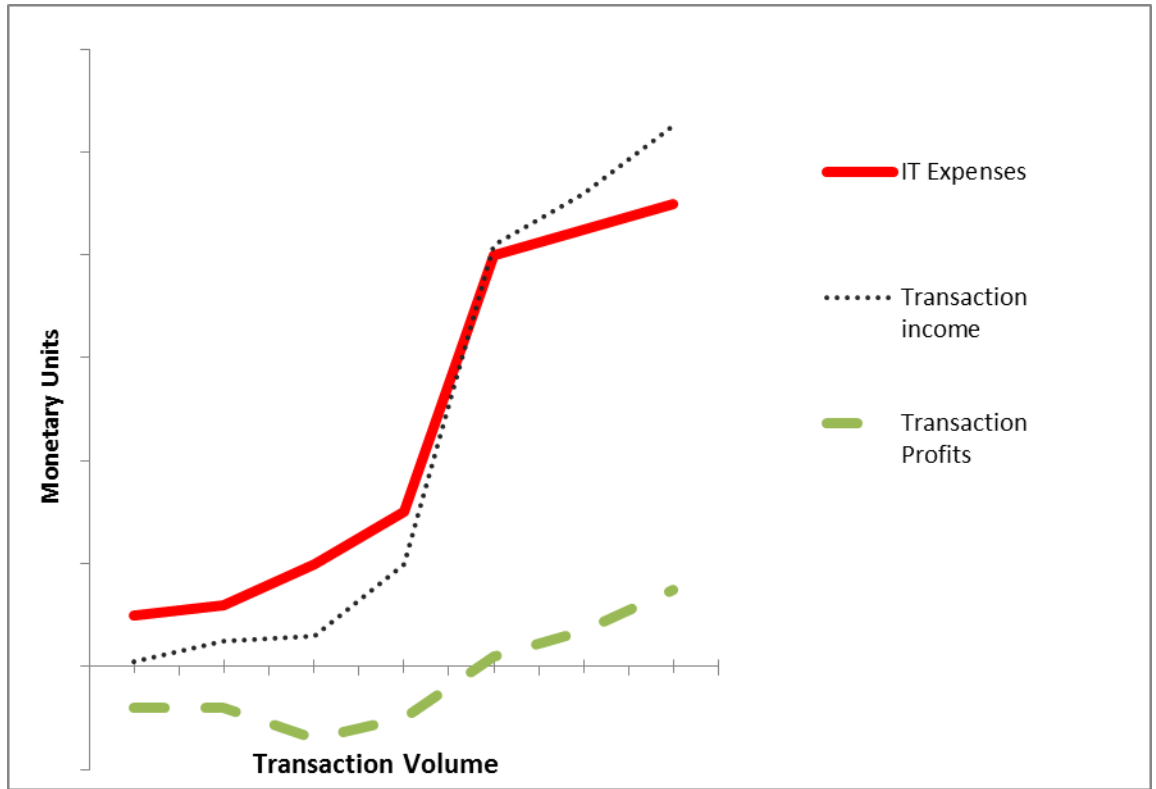
1.4.3 THE UNIT COST OF COMPUTERIZED TRANSACTIONS, THE BEST INDICATOR OF THE COST/BENEFIT PAYBACK

The decision to price transactions and user services is primarily a business decision, not a technology decision. Since automating transactions facilitates tracking them, DID recommends tracking the unit cost of IT transactions. This cost is used to determine the expenses that can be borne by the client user, as well as to determine the effectiveness of the technological solutions.

For example, you can lead the client to use a particular distribution channel where transactions are less expensive. The following figure shows how, by ensuring that the increase in the volume of transactions is achieved by increasing the volume of the more profitable transactions, you can achieve a payback from the benefits of implementing technological solutions and, therefore, offer the clientele more competitive prices throughout. We can thus obtain appreciable gains, inasmuch as the income from fees exceeds the IT expenses.

⁷ Tools aimed at fostering collaboration among peers, in a computerized or online environment, by allowing exchanges and sharing skills for greater success in a shared project.

Figure 6 – Example of Measuring the Gains



1.5 SECURITY AND RISKS

The security of financial transactions is the first concern of the clientele of financial institutions. If the clientele does not trust the security of its transactions, it will look for another institution. On this account, security is therefore not only the business of the institution’s employees but is with greater reason the business of the elected leaders and managers concerned with the institution’s sustainability.

Technological solutions Security

DID is of the opinion that IT security is part of the process of the integrated risk management process and senior management should be accountable for it.

1.5.1 INFORMATION TECHNOLOGY, A SELF-ASSESSED OPERATIONAL RISK

Integrated risk management is a systematic, proactive and ongoing process aimed at understanding, managing and communicating the risks from the point of view of an organization as a whole. In microfinance Institutions, several risk categories may be identified, such as credit risk, market risk, liquidity risk, operational risk, strategic risk, insurance risk and reputational risk.

Technological solutions are part of the components of the operational risk of microfinance institutions. Indeed, among the factors to be monitored with regard to operational risk are those

related to the systems and the operation of these systems, i.e., the quality of the information, IT security and technological complexity.⁸

The risk of data theft or attack on financial data, the potential loss in monetary terms and the negative impact caused by a loss of confidence in the institution after an attack on the security of its financial data should lead microfinance institutions to integrate IT security into their risk management process.

Various tools are available to manage operational risks. They range from auditing the systems to developing probability models, without neglecting critical self-assessment. DID recommends adopting a critical self-assessment approach to ensure the security of the technological solutions.

In fact, this simple approach is based on the assessment of the risks of the solutions that each of the institution's units should do. This assessment includes identifying the severity and frequency of possible losses due to attacks⁹ on the technological solutions coming from both the inside and the outside. This assessment also includes a description of the measures taken to control the risks. Each of the managers of the administrative units (IT unit included) should do a self-assessment of its operational processes. It should identify the risks, the likelihood of their occurrence and their impact. It should also issue standards, policies or guidelines, based on the results of this self-assessment.

With the aid of tools such as questionnaires, checklists and workshops, unit managers should inventory the risk-control factors. These factors should be added to a bottoms-up analysis approach. If necessary, a security audit performed by external experts can be added.

DID offers risk management tools: for example, the IT security policy containing guideline forms and *Top System 1 2 3* organizational performance assessment tool to ensure that all of the institution's departments are stakeholders in the management of the security of the technological solutions used throughout the institution.

1.5.2 IT SECURITY—THE BUSINESS OF SENIOR MANAGEMENT

The management of microfinance institutions is responsible for promoting IT security and ensuring the implementation of appropriate practices to preserve it. Management should adopt a security policy that all managers and employees agree to honor.

The security perimeter established around an institution is not only due to the implementation of IT security systems, but also secure operating procedures and the monitoring thereof. The security of data, operations and information in microfinance institutions necessarily involves strengthening internal control and inspection procedures.

From the technological point of view, the basic elements essential to be put into place are the firewall, antivirus software and the physical security of the premises and hardware. Mechanisms that will make it possible to protect information assets should also be set up: access control by passwords, assigning roles and responsibilities vis-à-vis the security of the solutions and the operational continuity plan.

The use of the Internet brings a safety concern that requires the establishment of appropriate security measures. Reliance must first be placed on security methods based on human actions,

⁸ *Financial Risk Manager Handbook*, P. Jorion, GARP, John Wiley & Sons, 734 pages, chapter 24.

⁹ Virus or hacker attacks.

such as compliance with internal control procedures before purchasing sophisticated security technologies.

Security solutions should be chosen in line with the institution's resources and risks incurred. Some initially costly solutions become affordable when the financial risks are amplified. Other security solutions prove more expensive than the financial risks against which they protect institutions. Should we have smart cards or magnetic stripe cards? Should we use biometrics to ensure the authentication of individuals? The answer lies in the assessment of the risks associated with the local, national or subregional environment.

Security entails a cost that has to be related to the probability of losses and the financial capacity of the microfinance institutions. In computer security, the need for system maintenance, identification of vulnerabilities and monitoring interventions are all factors that must be considered.

Platforms built with proprietary software include licenses that must be paid for and kept current. The same goes for the security of information and operations. Indeed, outdated licenses mean that the software is not up-to-date and has become more vulnerable to security breaches. The maintenance and replacement of computer hardware should, therefore, be budgeted accordingly.

DID recommends that the managers of the institutions ensure that their employees comply with the current security policies, standards and measures. DID also recommends automating critical processes, such as copying databases and automatically backing up databases. These backups must be done according to the level of risk acceptable to the institution. The institution must also determine the time it takes to restore these backups: less than a minute, an hour, one day or three days. Regarding changes made by technicians in the content of databases, the technological solutions implemented must include a logging tool that records these changes and provides a report to the internal auditors. This report allows management to check each of the possible changes made by the technicians and the manager or the auditor may decide whether a change is warranted or if it calls for explanations from the technicians.

2.0 TECHNOLOGICAL SOLUTIONS

This section presents the representations concerning innovations, consolidation of IT services and funding the support service.

2.1 INNOVATIONS

Historically, the accounting field was the first business area to integrate technological solutions into its processes. Since then, new technologies appear frequently in the financial world, because of the demands of performance placed on it. These technologies are often attractive because they appear as a solution to current problems and everyday irritants. They also provide an opportunity to better serve the existing clientele or to serve an emerging clientele we seek to retain. However, in this field, missed opportunities are sometimes fewer than unkept promises. In the face of technological innovations, DID recommends a traditional position termed "early majority."

Technological Innovations

DID favors the introduction of technological innovations at a stage where they have already been proven and have demonstrated significant reliability for the clientele of the financial institutions.

2.1.1 PROVEN INNOVATIONS

The behavior model in the face of innovations ranges from the innovator¹⁰, who is on the lookout for new developments and does not hesitate to include them in his modus operandi, to the latecomer who waits for the new developments to prove themselves to the point that they are no longer novelties, but everyday products. DID recommends to its partners that they adopt a position of “early majority” in the face of technological innovations. This position calls for an openness to innovations but also requires assurance with regard to the sustainability of these innovations. This position is both prudent and open to innovations and their potential risks. It allows institutions to outperform their competitors while controlling their expenses and investments in technology.

Because the technologies are at the heart of the operations of financial institutions, DID recommends using reliable, secure and proven solutions. DID recommends that microfinance institutions seek robust systems, built with proven IT tools, to ensure the integrity and security of the data and operations.

DID has made the choice of engaging only in technological projects with appreciable and measurable guarantees of success with respect to business objectives. It is important to remember that the analysis of operational and organizational aspects takes precedence over technological aspects. Feasibility studies to measure the impacts of technological innovations on market penetration, human resources, the environment and poverty reduction are indispensable.

The limited investment capacity of microfinance institutions reinforces the strategic importance of properly evaluating any innovative project to ensure a cost/benefit payback for the institution. In fact, it is the cost/benefit ratio that should guide the project.

Currently, in the world of microfinance, technological innovations most discussed with regard to this cost/benefit ratio are mobile banking, branchless banking, payment systems (whether people-to-business [P2B] payments or government-to-person [G2P] payments), the provision of banking services through networks of agents and the involvement of cellular operators in the access to financial services.

2.1.2 APPRECIABLE RELIABILITY

Some traps are to be avoided by the buyer of technologies. The buyer would do well to be wary of sellers of technological dreams that promise an answer to all problems. The buyer should also resist the urge to go after the flavors of the month. Funds can be made available for testing new technologies, although they have not proven their sustainability or have not yet clearly identified the conditions for success that will ensure this sustainability. So one has to make sure that these tests are worthwhile and not commit institutions to unprofitable expenses.

To prevent these unprofitable expenses, a technology watch must be exercised. This watch can be considered under two facets: watch by suppliers and watch by the clientele.

The first facet is well known: this is a matter of staying abreast of the latest technological innovations offered by the suppliers. There are several ways of doing this. Already, international agencies have units specializing in the technology-watch field for microfinance institutions. It is also important to keep abreast of technology advances around the world, as in all facets of technology, without being limited to microfinance. Indeed, technological advances are generic and it is their applications and implementations that specialize in one or more areas.

¹⁰ The possible positions are “innovator,” “early adopter,” “early majority” or “slow majority.”

The second facet of the technology watch is also important. This involves being on the lookout for innovations adopted by the microfinance clients or toward which the clientele is receptive. For example, the funds transfer service by cell phone, which operates in some countries, seems less worthwhile in other markets. Several issues, such as accessibility and the quality of some alternative solutions, the competition, the time required to reach a sufficient critical mass, population concentration and pricing are all factors that can explain why there is less interest elsewhere. This example raises the importance of knowing the characteristics and the behavior of the clientele in order to choose the most appropriate technological innovation.

2.2 COMBINING TECHNOLOGIES

When it comes to pooling resources, DID has issued a position paper regarding integration into networks. Indeed, DID recommends: *“that sharing of resources within federated networks allows for grouping of inputs, access to support services and collectively-owned property of complementary services. The entities in federated networks have access to resources they would not easily obtain in an atomized model.”*¹¹

There are several forms of consolidations that allow the institutions to leverage the technology resources. These groups may take the following forms:

- The establishment of a computerized processing center;
- The outsourcing of the IT function;
- The creation of an IT services company;
- The consolidation of points of service or parent cooperatives.

The federated model is an advantageous model for the implementation of affordable and effective technological solutions.

Consolidating IT Services

DID is of the opinion that microfinance institutions would do best to band together to obtain better IT services at lower costs.

2.2.1 TO OBTAIN BETTER IT SERVICES

The benefits of consolidating microfinance institutions are as follows:

- offering better services to clientele;
- reaching a greater number of persons;
- achieving economies of scale;
- mastering the complexity of the processes;
- reacting more quickly to change;
- acquiring and sharing more expertise;
- reducing risks.

¹¹ DID's Position Paper on Federated network integration, May 2005; "The characteristics of a Federated Network of Financial Cooperatives" p. 4.

The function of information technologies involves several areas of expertise such as development, implementations, management, training, support, maintenance and security. The mastery of all these specialties can be very costly and restrictive for a single institution.

The pooling of resources and particularly access to support services is probably the main motivation for entities to band together. They then join together to share quality services they could otherwise not obtain.

2.2.2 TO OBTAIN IT SERVICES AT A LOWER COST

For microfinance institutions with a low volume of transactions and unable to pay for an autonomous technological infrastructure, DID recommends joining an IT processing center.

The outsourcing of data processing, i.e., to an independent provider, is one possible avenue that must however be prudently managed. Contract clauses, data privacy, security, sustainability and the evolution of systems, as well as the quality of the service obtained, are crucial factors that should be negotiated in advance. Inasmuch as the technological solutions are strategic for the institution, they must therefore be well managed before they are outsourced for economic reasons.

Regional outsourcing can also be considered. Obviously, choosing this avenue requires a strategic approach. The institution must first reach maturity in technology management, before sharing technological processes or technological resources.

The consolidation, such as the integration into a federated network, also allows achieving economies of scale. For example, to rationalize resorting to human resources with expertise in technology, certain aspects of the microfinance institution's IT processing can be transferred to the apex organization and certain processes can be centralized there. This way the first-tier institution can be freed from tasks of a technological nature, such as backing up the database, closing out the day or producing reports.

2.3 FUNDING SUPPORT AND MAINTENANCE

It was previously mentioned that DID considers the technology expenses as investments managed on the basis of a business plan. These investments should be tracked. Therefore, it is necessary to allocate budgets and devote efforts to caring for and maintaining these technology investments.

Funding Technology Support

DID is of the opinion that the support and maintenance of the technological solutions are essential to the sustainability of the systems and that it is up to the institutions that use these solutions to fund them.

2.3.1 ENSURING SUSTAINABILITY

In order to ensure the sustainability of the technological innovations, it is essential to maintain them and to support their users. The costs associated with this maintenance and this support were presented in the representation about investments.

The support required immediately after the implementation is very important since the users are then learning to work with the new solution. The investments required for this initial support are

often readily accepted. However, these investments have to be maintained because the maintenance of the system becomes a guarantor of its sustainability since it ensures harmony between the system's functionalities and the clientele's changing needs. Indeed, the users' needs change, become clearer and require adjustments to the system. An information system will continue to be useful to the extent it will be maintained and kept up-to-date in full security. Consequently, any negligence in the maintenance of a solution or the support for its users risks generating obsolescence of this solution.

There are two types of maintenance: preventive maintenance and corrective maintenance.

The purpose of preventive maintenance is to avoid a possible shutdown or malfunction of the system. This type of maintenance requires those in charge of the institution to be proactive to keep the system in good operating condition and thus prolong its life. Preventive maintenance results in the periodic updating of the systems in order for them to be able to take into account the added improvements, technological advances and patches. This upkeep requires the involvement of internal and external experts and can affect the users' daily operations. Therefore, they must be anticipated and budgeted.

Preventive maintenance is essential to sustain the solution. In general, this upkeep is directed by the providers of software packages who require a periodic financial contribution (usually in the form of annual fees). These fees allow suppliers to fund the updates of their products. Without this funding, products no longer improve, become obsolete and disappear from the market. The economic model used by the suppliers of technology products is increasingly oriented toward billing for maintenance and support and less and less towards the licensing fees. The institution must take this into account in its budget.

Corrective maintenance is also designed to correct a system that stops working unexpectedly. In this case, actions have to be taken quickly. So this requires the institution to make budget provisions that make it possible to cover these critical actions when required.

2.3.2 FUNDING THE SUPPORT SERVICE WITH OPERATING INCOME

The support is a service offered to the system's users to help them solve a specific problem. It is not intended to replace training, configuration or customization of the system but rather rounds out the range of services related to the implementation of a technological solution. It is up to the users of the technological solutions to fund this aspect. DID believes that this funding should come from income from the operations of the microfinance institution and not subsidies. Subsidies, if any, should instead be used for implementations, developments required to meet distinctive needs, major and exceptional changes and the introduction of new approaches.

DID recommends that the maintenance and support activities be funded with income from the operations since fees can be charged for electronic transactions through everyday operations. This is a way for the institution to achieve operational autonomy more quickly.

In fact, the section concerning technology investments presented earlier in this document mentions the possibility that users who derive benefits from them bear the transaction costs in order to ensure the financing of the technological solutions and the maintenance thereof. This is, however, a recommendation: the decision is up to the institutions.

Funding the support service is a complex subject. It is even more so if it involves several institutions affiliated to a federated network. This funding may assume different forms according to the understandings between the participating institutions. It may be prorated according to the volume of transactions, number of clients, transaction amounts, assets, etc. DID recommends establishing

this funding based on the income obtained from the billing of financial transactions processed by the technological solutions. In fact, the volume of transactions is an excellent indicator of the use made of the technological solutions.

3.0 TECHNOLOGY

This section encompasses the representations relating to the software packages (as opposed to customized development), the importance of the single version for technological solutions and data location.

3.1. SOFTWARE PACKAGE VS. CUSTOM SOFTWARE

In its institutional position paper regarding network integration, DID recommends that the systems be standardized. *“Integration into a network presupposes strong centralization of operational systems, policies and norms, products and the institutional image. Standardization contributes to better performance(…)”*¹²

The standardization of the operations leads to the use of identical technological solutions across the different components of a network. The idiosyncratic peculiarities of the institutions should be resolved by the possibility to customizing the solutions and not by the use of different solutions.

The standardization required by the external partners of the institutions should also be a subject of concern. Indeed, since technological solutions are required to communicate with external systems, especially ever since telecommunications have become available, they should meet the norms and standards of the market and governmental institutions. This is why DID recommends adopting generic technological solutions that meet these criteria.

Acquiring Technological solutions

DID recommends acquiring software packages unless different and strategic needs require custom development.

3.1.1 GENERAL AND SHARED NEEDS CALL FOR A SOFTWARE PACKAGE

DID recommends the acquisition of software packages for the operating systems, since there are tested and reliable solutions that cover all of the operations of a microfinance institution. In DID’s experience, general needs, such as savings, accounting and credit management, can be satisfied with a generic solution.

So DID recommends that institutions not develop an operating solution on their own. The development of this type of in-house solution may prove very costly and risky. A development project requires several types of expertise and, therefore, specialized resources (business analysts, architects, programmers, developers, quality management analysts, etc.) who have to act at different times in a project. However, as mentioned in the representation about the consolidation of services, the institutions cannot hope to bring together all of these types of expertise in an area as specialized as IT development for microfinance. Also, the risks of cost overruns and delays are significant for results likely to fall well short of acceptable standards.

¹² DID’s Position Paper on Federated network integration, May 2005; “The characteristics of a Federated Network of Financial Cooperatives”, p. 5.

Generic solutions are designed to be used by the largest number of institutions, as long as possible. This is why the solutions tend to conform to the standards such as ISO, Basel, ITIL and government standards. With generic solutions, maintaining this compliance is the supplier's responsibility. However, the implementation of a software package may require adjustments in both the software package itself and the institution's processes. It is recommended not to systematically direct adaptations at the software package level. Indeed, sometimes it is preferable to adapt the institution's internal processes to the dictates of the software package, since changes in the software may be more onerous or more risky than changes to internal processes. Once again, this is a choice that is up to the managers of the institutions.

DID recommends the use of financial-transaction management software and business-intelligence software for the decision-making system. The studies conducted by DID on different software packages have led to the choice of specific software packages to meet the needs of the microfinance institutions.

3.1.2 DISTINCTIVE AND STRATEGIC NEEDS CALL FOR CUSTOM SOLUTIONS

It is important to underscore the fact that, with regard to developments, the terms "distinctive" and "strategic" qualifying the needs are crucial and are antonyms of the term "generic". The terms "distinctive" and "strategic" define a custom solution that differs from those offered by the competitors and offers the clientele an original, focused, often cutting-edge product. For example, an institution may require a custom solution for its flagship products in order to quickly provide financial service and anticipate its competitors on the market. Also, an institution or a group of institutions may express a need that cannot be filled at a reasonable cost by generic solutions available on the market.

It may occur that a distinctive internal solution is developed and does not meet all of the international and governmental standards. Even if this situation can be acceptable, it is important to keep in mind the following two elements: 1) this choice is strategic and based on a circumstantial occasion; it must therefore be revised over time, and 2) this choice should not lead to the implementation of non-standard or doubtful practices.

The distinctive needs require a custom-developed solution. However, a distinctive solution can be built by adding interfaces to a software package. This is the case of the business intelligence solution developed by DID. Indeed, on the basis of the recommended business intelligence software, DID has developed a distinctive solution.

Based on carefully selected software packages, DID has been developing strategic technological solutions for its partners. Thus it is that DID has developed, for example, interconnectivity, "automated market tellers" and the "offline" transactional solution based on the same software package. These solutions allow the partners to stand out from their competitors and offer their clients leading-edge solutions.

Office tools such as Excel and Word are well mastered by the users. So it turns out that the users develop solutions based on these tools because they are available and well-known. However, they are office tools too limited to support a solid and proven technological solution adapted to the needs of financial institutions. Indeed, the limits on data security, access control, data integration and backups cause the solutions developed from these tools to be restricted to personal environments. So DID does not engage in deploying or troubleshooting solutions developed with office tools. Despite this, this does not mean that the technological solutions developed by DID cannot draw on or feed into local solutions developed with office tools.

3.2 SINGLE VERSION

We can easily see the benefits of standardizing technological solutions. Indeed, it is enough to think of the investments required to maintain and develop one version of a technological solution to not want to maintain several of them. Economies of scale are quickly noticeable when the versions of the solutions are the same everywhere.

Single Version of Technological solutions

In its actions, DID recommends the deployment of a single version of its technological solutions to optimize the development and support costs.

3.2.1 SINGLE VERSION, SOURCE OF ECONOMY

Financial transactions are generic, universal and standardized. In this sense, they can be processed by a single and unique technological solution that meets these generic, universal and standardized aspects. The local features, in turn, are part of the parameters of the comprehensive and single solution.

DID recommends the deployment of a single version of the technological solutions for its partners. The objective of this recommendation is to allow the standardization of the systems, to facilitate the management, maintenance and support thereof, as well as to improve the prioritization of the demands for change. It also allows reducing the development, deployment and maintenance costs. In addition, this single version of a solution produces a cost that is the same for all, regardless of the characteristics of the user institutions. This single version also improves the power relationship vis-à-vis the IT suppliers, because they then consider the institutions as a major privileged client with a considerable impact on their business.

This uniqueness further facilitates the interconnection between the microfinance institutions that are part of an association. Indeed, technological networking requires compliance with standardized telecommunication protocols. However, complying with these protocols is costly, laborious and requires relying on very specific expertises. The use of single version of the solutions makes it possible to devise shared infrastructures, which facilitate exchanges at a lower cost. This is why DID recommends using a single version of the solutions and similar infrastructures to allow a simple, effective interconnection at a reasonable cost.

Regarding the decision-making solution, the single version can effectively provide the required reports and indicators for institutions that are subject to the same regulations. The flexibility of the decision-making solution can also offer the same solution for different regulations, by adapting the data-retrieval parameters and developing indicators and reports that comply with these regulations.

3.3 LOCATION: DECENTRALIZATION VS. CENTRALIZATION

Although it recommends the standardization of technological solutions and using a single version of the technological solutions within an institution, DID qualifies its position as to the place where the clientele's data should reside.

Data Location

DID recommends keeping the data in the institution in order to bring the information close to the clients and optimize the availability of the systems.

3.3.1 MAXIMUM AVAILABILITY

The availability of technological solutions is a key element of the operational performance. Every institution must have at its disposal, at all times, the systems and data needed to operate. The availability of the technological solutions should move towards 100% during business hours in order to better serve the clientele. It is unacceptable not to be able to serve a member or a client because the systems are not available.

The unavailability of technological solutions may have its origin in failures of the hardware, software, power supply or the local-area network (LAN) or wide-area network (WAN). To maintain the availability of the systems and to minimize dependence on external capacity, DID recommends keeping as close as possible to clients and members the factors necessary for IT operations. Thus, the database which supports the operations must reside at the institution's site, which is the way to ensure maximum availability of the services. In the event of a failure in the WAN (telecommunication), the institution's operations can thus be continued and members who come into the institution can be served.

Where the WAN communication is reliable, available, proven and affordable, the centralization of the systems and databases is a possible solution, to the extent that it ensures the same availability of the operations.

It is necessary to have an appropriate contingency plan to enable the institution to quickly resume operations in the event of a disaster. This contingency plan should include the regular uploading of a copy of the database outside the site as well as making available the required hardware to resume normal operations using this copy of the database.

3.3.2 THE DATA BELONG TO THE CLIENTELE

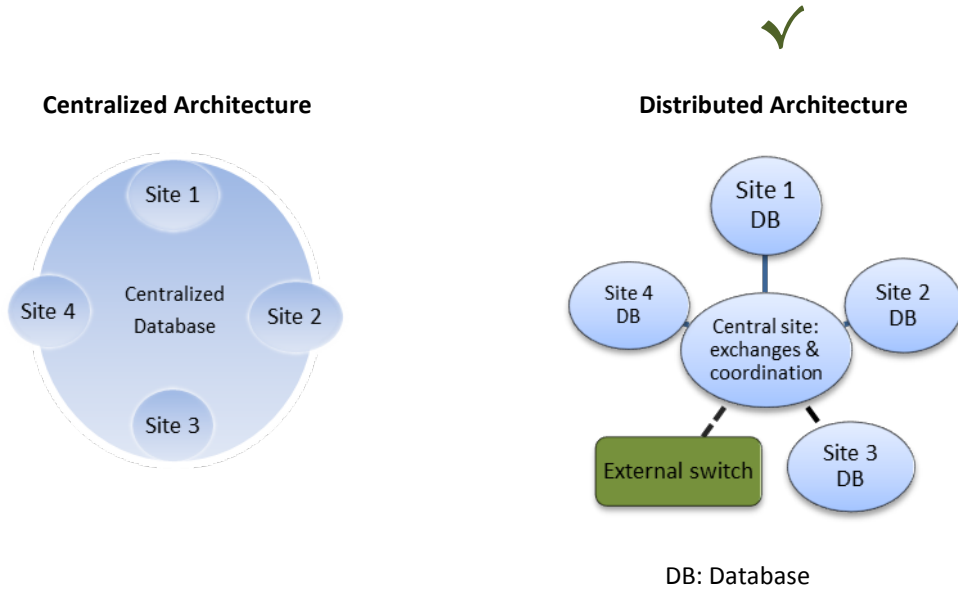
Even if the data reside at the institution's site, the members and clients may decide to make available these data from other sites or other channels. DID recommends allowing access to these data from other sites or other channels.

However, controlled access must always be given when the data exchanges are required by channels outside the institution. The data contained in the databases of information systems belong to the members and the clients. It is up to them to decide who may access these data and under what conditions. This access can be provided to facilitate offsite transactions, to connect to an ATM network, to connect to a payment service of a company or a service provider or else to connect to a government service.

With respect to interconnection needs and distribution channels such as ATMs and POS terminals, the clientele will be more easily satisfied in an environment where the data are centralized (centralized architecture, see the following figure). However, telecommunications technology, especially Internet advances, now allow access to distributed sites where a center takes care of the

switching and the coordination of the electronic transactions. Such distributed architecture allows remote access while keeping local access available at any time and under any condition.

Figure 7 –Architectures sites



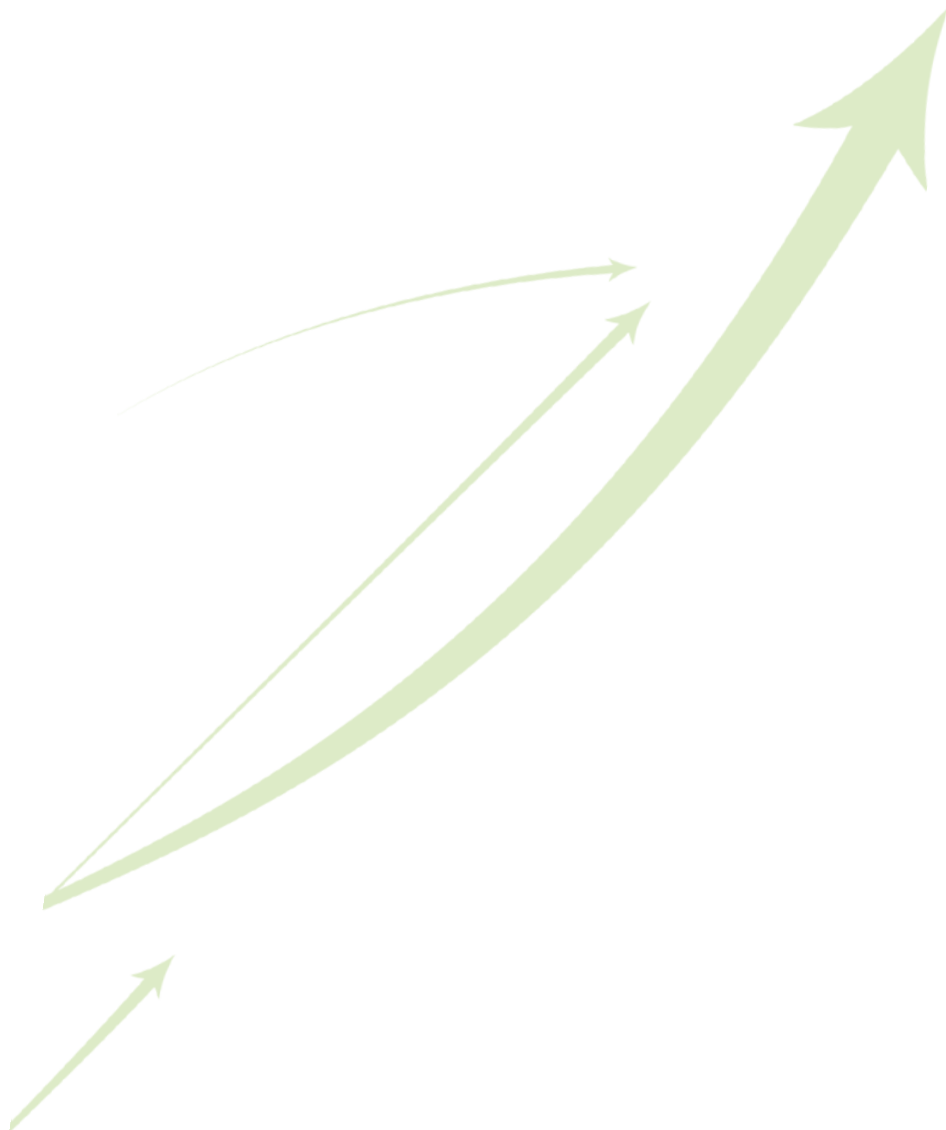
DID has found that the best way to contemplate the use of technological solutions is to do it from the perspective of customer service, within a strategy consistent with the institutions' mission, by taking advantage of all the advantages offered by the technology.

CONCLUSION

Technological solutions contribute essentially to increasing the scope and security of the financial products and services offered to the population. The choice of solutions to be adopted should be based on the financial and technological capacity of the microfinance institutions, as well as the environment in which the customer operates. In addition, this choice should allow the evolution of the solutions adopted so that they can align themselves to the growing needs of the clientele. In all cases, microfinance institutions should consider adopting technological solutions as an investment and therefore ensure they will derive and measure the benefits from them.

For DID, the security of the information and the availability of services to the members rank first in the decision-making criteria leading to the technological solution choices to be implemented. These two factors are indeed essential conditions for the sustainability of these solutions and the institutions that implement them.

The institutions that operate in a federated network have an undeniable advantage because of the standardization of member services and the pooling of their resources, which promotes access to the financial and human resources required for the implementation, use and maintenance of the technological solutions.





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To consult DID's other position papers, or for any other information about our organization, you may visit our website at www.did.qc.ca.

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