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This paper illustrates the potential for management information system (MIS) technology to integrate information collection, management and reporting within a single program or network of organizations. Properly devised and created, MIS applications improve administration, service delivery and practice evaluation. Three strategies are offered to guide the design and development of MIS software. This paper is based on lessons from the production and implementation of MIS software that serves as a management and evaluation tool for a nationwide policy demonstration. Data from the MIS have helped to shape state and federal policy.

The Center for Social Development (CSD) at Washington University in St. Louis created an MIS application to serve both as an administrative support and evaluation tool for a network of thirteen community-based organizations (CBO) offering matched savings programs throughout the United States. The goal of these Individual Development Account (IDA) programs is to assist low-income individuals and households to accumulate sufficient savings to invest in assets, such as homes or small-businesses, that have the potential to generate benefits over the long-term. This Management Information System for Individual Development Accounts (MIS IDA) was then redesigned for release as a commercial-grade application. Currently, more than 200 IDA programs are using the software. MIS IDA has helped to shape and accelerate the growth of the IDA field, and may serve as a model for enhancing practice and policy with technology.

In the first half of this paper, we discuss how MIS technology can integrate areas or components of practice into a single practice system. By incorporating the information collection, storage, and reporting needs of administrators, service delivery staff, and evaluators into the same system, work in each area is more readily linked with that in others. However, the creation of MIS applications that can achieve this result is challenging. Thus, in the second section, we offer three strategies that were used in the design, development, and dissemination of MIS IDA. These strategies may help other practitioners and researchers ensure that the final product enhances the efficacy and efficiency of service delivery and evaluation within a single or network of organizations. We conclude with implications for social work education.

Using MIS Technology to Create a Practice System

Information management is a critical aspect of social work practice, administration, and evaluation. Relationships between the practitioner and client, the organization and its funding sources, and researchers and practitioners, are characterized by the exchange of information. Therefore it is not surprising that MIS technology increasingly is being used to improve the collection, management and distribution of information within community-based human service organizations. The potential benefits from developing MIS applications to support practice and research are great and the greatest impacts are achieved when MIS applications are proactively created through a collaboration of all stakeholders and crafted as an administrative and evaluation tool. When this occurs, the MIS can integrate discrete components of social work practice, administration, and evaluation into a single system.

Component-based Practice. At risk of oversimplification, work within a single organization can be viewed as comprised of three distinct components: service delivery, program administration, and – sometimes – evaluation (Figure 1). Information management for each component typically occurs in relative isolation. In other words, a MIS may be introduced to assist in one area with little impact on other areas. For example, a program may use in-house expertise or contract with an outside consultant to produce a MIS to support case management. This may be carried out with some thought as to the types of information that would be useful to administrators of the program, i.e., demographics. But, it is less common for programs to consider what the key evaluation questions are that could shed light on the efficacy and efficiency of program operations. Thus, this case management application may be unconnected to a second application used to record intake information, client contact hours, or staff time and budget expenditures. As a result, the organization has incurred significant time and financial costs to produce a MIS that does not support work across these three components.

When not carefully planned, the development and use of MIS technology to support discrete types of work within an organization can introduce inefficiencies. For example, if different software platforms are used in each area (i.e., spreadsheet and relational database), the data may be stored in inconsistent formats. Many agencies store information in a flat-file (spreadsheet) format, i.e., Microsoft Excel™ and data in this format are not easily recorded, managed, or merged. Relational database technology, such as was used to create MIS IDA (Microsoft Access™), is far more efficient and flexible for these tasks. The use of separate MIS applications increases costs when discrepant data must be merged or missing data entered for use in operational reports or for program evaluation.

Figure 1. Practice Components

Figure 2. MIS-Enhanced Practice System

Creating a Practice System. The successful adoption and use of MIS IDA by more than 200 IDA programs demonstrates that it is possible to enhance practice by integrating the collection, maintenance, and reporting of data for each component within a single MIS (Figure 2). Merging these information processes is perhaps the most important step in blending discrete practice components into a single system. In this scenario, the organization addresses the information needs for administration, service delivery, and program evaluation simultaneously.

An integrated MIS can generate benefits to individuals working within each area (Goodhue, Wybo, & Kirsch, 1992). Program administrators can merge trend data on client contact hours with program expenditures in order to produce better budget estimates. MIS technology also can support evidence-based practice. For example, if the appropriate data are recorded, it may be possible to identify the most efficacious types of services for particular types of clients. Even in very large programs with complex service options and considerable client populations, MIS technology can assist in monitoring the effect of program-level factors on client outcomes (Rupp, Driessen, & Kornfeld, 1999). These data are most likely to be collected when the MIS is designed to serve as an administrative, service delivery, and evaluation tool.

MIS technology can best support evaluation by folding the collection of standardized evaluation data into routine service delivery and program administration tasks. If an organization wishes to design an application that accomplishes this, it is important that an evaluation agenda be developed early in the design process and used as the core of the MIS. This allows the organization and its partners (i.e., funding sources, local partner institutions, etc.) to discuss and refine the agenda so that it addresses the information needs of each. This point is more fully discussed in the next section, where we offer three strategies used in the creation of MIS IDA that contributed to its rapid adoption and positive impact on the IDA field.

Strategies of MIS Design and Development

The initial impetus for creating MIS IDA was the need to obtain timely, reliable, clean data to evaluate a national policy demonstration. Once the decision was made to release the application to the broader IDA field, CSD facilitated a collaborative design process, which focused on creating a tool that would facilitate the operation of IDA programs and their evaluation (Premkumar & King, 1994). The timing of this process allowed the MIS application to evolve along with and help guide the growth of the IDA field. Below we highlight three strategies that led to the overall success of these efforts.

Collaborative Design and Development Process. MIS development necessarily requires those who understand MIS design, those who understand the technology involved in coding such applications, and those who understand the program or service area. MIS IDA's design and development was led by a team of social worker researchers familiar with both MIS technology and human service delivery.

Prior to beginning the development of MIS IDA, researchers from CSD and an advisory research group posed questions about the impact of IDA program and participant characteristics on saving behavior.¹ This research agenda was then used to create a monitoring

¹ The Evaluation Advisory Committee was developed to assist in the evaluation design of the American Dream Policy Demonstration and is comprised of: Dr. Margaret Clark (Aspen Institute), Dr. Claudia Coulton (Case Western University), Dr. Kathryn Edin (University of Pennsylvania), Dr. John Else (Institute for Social and Economic Development), Mr. Robert Friedman (Corporation for Enterprise Development), Dr. Irving Garfinkel (Columbia University), Dr. Karen Holden (LaFollette Institute of Public Affairs), Dr. Laurence Kotlikoff (Boston University), Dr. Robert Plotnick (University of Washington), Dr. Salome Raheim (University of Iowa), Dr. Marguerite Robinson (Harvard University), Dr. Clemente Ruiz Duran (National University of Mexico), Dr. Thomas Shapiro (Northeastern University), Dr. Michael Sherraden (Washington University).

instrument that would collect the data needed to answer these questions. CSD's initial intent was to migrate the monitoring instrument from paper forms to a Microsoft Access™ database application for use by IDA program administrators in the field. The goal was simply to create an electronic version of the evaluation instrument.² However, as the instrument was being refined and discussed with field practitioners, CSD was asked to expand the functionality of the application to assist with program and account management.

Practitioner insight was critical to the design process and helped to expand the scope of MIS IDA's capabilities. Recognizing that other organizational partners of an IDA program community would also have information management and reporting requirements, the design process was expanded to include: representatives from funding sources and financial institutions, policymakers, and other program practitioners. This ensured that the final MIS IDA product would effectively serve all constituents of an IDA program (Wood & Gray, 1991; Landsberger, Coursey, & Loveless, 1997).

The IDA program must also form partnerships with other community institutions. In the case of IDA programs, these partners include financial, consumer credit, and housing organizations. Therefore, MIS IDA was developed with input from a variety of community institutions, further utilizing the collaborative approach to MIS design. To illustrate, MIS IDA can be used to facilitate the transfer of information between financial institutions that hold the IDA accounts and the IDA program. Periodic transfers of account data may also build stronger institutional linkages between the financial institution and the program.

Collaboration should occur, not only in the design phase, but also through development and implementation (Hartwick & Barki, 1994). During MIS IDA's development, field practitioners continued to make suggestions regarding data to be collected and reports that would be required in the field. The software was refined accordingly.³ These field practitioners also performed beta testing of the application, prior to its release giving them a critical role in the actual development of the system. Pre-adoption involvement of users in the design and development process fostered positive perceptions of the software's potential (Karahanna, Straub, & Chervany, 1999). An important consequence of this was the later reduction in the amount of time to train practitioners on the use of the software. Moreover, their involvement reduced the incidence of "technology shock", which can occur when new technologies are suddenly introduced into the practice environment.⁴

² Michael Sherraden made the decision to create monitoring software and the initial electronic instrument was developed in July 1997 by staff at CSD: Margie DeWeese-Boyd, Karen Edwards, and Michael Sherraden. Version 1 of MIS IDA was developed for the 13 program sites involved in the American Dream Demonstration in September 1997. Version 1 was developed by Lissa Johnson and Jim Hinterlong of CSD, and Jerry Whittle of Quality Software Engineering, Inc.

³ MIS IDA Version 2 was commercially released to the IDA field in November 1998. Version 2 was developed by Lissa Johnson, Jim Hinterlong, and Michael Sherraden of CSD, and Ross Baker and Mark Kombrink of System Service Enterprises, Inc. Version 3 was released in December 1999. Modifications to Version 3 were completed by staff at CSD: Patrick O'Brien, Lissa Johnson, and Margaret Clancy.

⁴ Following the application's commercial release to the broader field, CSD addressed this problem by instituting a training service to assist users for whom MIS IDA is new or who desire additional preparation. Technical support is also available.

Collaboration during the design and development process was integral in creating a more robust MIS with integrated capabilities. The guiding vision was that a data collection instrument must be capable of providing information relevant to all program stakeholders: program administrators, counselors, researchers, funders, and policymakers, as well as program participants.

Integrated Practice Components. In human service organizations, data management activities are often logically divided between applications for participant (client) services, administration, and evaluation. However, a properly designed MIS can integrate the information requirements of all three areas within one system. To this end, an integrated system must gather data in a manner consistent with daily program operations and casework protocols, and make that data available in a variety of formats. One way in which MIS IDA accomplishes this task is by merging information about program design and costs with participant characteristics and account activity. This enables the IDA program to provide timely, accurate reports to each stakeholder, which enhances the program's accountability (Austin et al, 1982; Freel & Epstein, 1993). Below is a description of each of the main components in MIS IDA, categorized by the three practice areas noted above, to show how data can be integrated into one system for use by all program constituents.

Client Services. Client services in an IDA program, at a minimum, include assisting the participant in opening a matched saving account at a partnering financial institution, providing economic education, and assisting in purchasing the desired asset. Program workers use MIS IDA to enroll participants, collecting demographic and contact information as well as current levels of income, assets, and liabilities. This information is updated semi-annually to track changes in demographics, income, and net worth. A case notes function in MIS IDA allows program caseworkers to note the completion of economic education classes and record narrative comments.

Participant account information from the partnering financial institution(s) is entered or electronically transferred into MIS IDA to track account statement activity and to calculate the matched savings for each participant. An account statement is periodically generated for the participant showing the personal saving plus the accrued match amount. Account tracking allows program workers to monitor participant savings behavior. Clients can then be counseled on how best to maximize the benefits of participating in the IDA program, namely, how to establish and sustain a saving pattern that will lead to the receipt of the highest possible match dollar amount during a particular savings period.⁵

Administration. MIS IDA divides administrative data into three main components: program design characteristics, expenditures, and funding sources. Program design data describe the context within which the participants interact with the caseworkers, administrators, and other program partners. For example, when users first install and run MIS IDA, they are asked to provide information concerning host organization characteristics, rules for the design and use of IDAs, and the types and amounts of economic literacy training provided to participants. These questions reflect factors that may contribute to program success. Semi-annual updates

⁵ IDA programs generally cap the amount of match dollars available to any one account. Thus, participants obtain the maximum benefit by making deposits up to but not exceeding a clearly defined limit.

of this information are then recorded to track changes over time, which, in turn, can be used to identify programmatic factors linked to successful implementation and desired participant outcomes.

Program expenditures, such as salaries, staff time, and utilities, are entered periodically to track the costs of running an IDA program. Marketing and participant recruitment techniques are also recorded to track factors of enrollment success. Reports may be generated to show such information for a given time period or aggregated over time.

Funding sources and contribution amounts are recorded, as are the distributions obligated and made to participants when assets are purchased. Thus, MIS IDA serves the information needs of both participants and the administrator by tracking participant account activity, match fund obligations to individual accounts, and use of participant and match savings to purchase assets. By integrating the funding obligations with individual account information, MIS IDA generates reports that are also useful to foundations and other funding partners that track and project utilization of grant dollars by IDA program participants. These reports can be provided on demand to external funders, which enables the IDA program to be highly responsive and accountable to the information needs of its partners (Eggertsson, 1997).

Evaluation. Two levels of evaluative data are generated from MIS IDA. First is the custom report generation capability within the structure of MIS IDA that allows program workers to run reports at any time for all of the data that have been collected. The second level is the dataset from MIS IDA's database that can be transferred to statistical analysis software for more extensive analyses that relate program characteristics, participant characteristics, and savings performance.

The integrative aspect of MIS IDA's database is that key evaluation questions are blended into forms that record program design and participant information. This means that programs accumulate evaluation data through use of the software for day-to-day operations. Additionally, certain information is updated periodically by the program, producing longitudinal measurements of important variables such as participant income or staff time expenditures.

By combining information about the program with that of participants and savings activity, MIS IDA's reporting system can answer key evaluative questions regarding the interactions between program implementation, participant characteristics, and IDA account structure. Program administrators use date-stamped information collected and stored in MIS IDA within the application's dynamic reporting system to generate both current and historical reports (Appendix A-1). The reporting system of MIS IDA places this information at the fingertips of program administrators and frontline workers. As noted previously, an important feature of MIS IDA is that the various stakeholders in an IDA program benefit from this information as well. The application contains numerous reports that were designed to meet the different information needs of funders, policymakers, program administrators, counselors, and participants. Reports generated by the system enable IDA program administrators to be accountable to external partner organizations and to feed information on demand to internal decision-makers (Austin, 1982; Freel & Epstein, 1993).

One major challenge in creating a MIS is providing for its usability across program settings. To this end, two design features are employed. First, data are collected by MIS IDA in a standardized format using lists of response values where possible. Users may customize the response values for some fields within the participant information section of the system, which provides greater flexibility in reporting on subsets of participants without sacrificing standardization. Second, a set of best practice guidelines is integrated into the functional structure of MIS IDA (Hinterlong, Johnson, and Sherraden, 1999). These guidelines are primarily concerned with IDA program design and account structure. Thus, program administrators have the freedom to customize the software to suit their programmatic designs without facing constraints on how their programs are organized or operated. Yet, by using MIS IDA to establish general account structure and management guidelines, the IDA concept is implemented similarly across sites. These embedded standards and research focus offer the ability for MIS IDA to be used in a variety of program settings with positive implications for the growth of the field and evaluation. As IDA programs have grown into larger statewide networks, it is important to collect comparable data across sites. MIS IDA's design provides the ability to aggregate data across different sites for more extensive data analyses.

Proactive Development and Distribution. In addition to collaborative design and integrated practice functions, MIS IDA's success has been in large part due to the timing of its development and release to the field (Nurius, Berger, and VanDerWeele, 1988). In 1997, federal, state, and local governments, in collaboration with community-based organizations, were just beginning to implement IDA programs, but lacked systems that could assist in evaluation and program management. Thus, development of MIS IDA interacted with program and policy development in the field. By incorporating "best practice" guidelines for IDA program design into MIS IDA, and making the software available at an early stage, the IDA field grew at a faster pace. Indeed, we believe that MIS IDA, in use in over three-quarters of all IDA programs in the United States, has played a significant role in advancing this emerging practice and policy innovation.

MIS development, and especially evaluation tools, often trails program design and implementation. In this case however, theoretical propositions regarding the factors likely to influence participant saving behavior and asset accumulation were articulated well in advance of program implementation. Likewise, the potential effects of saving through an IDA on the individual, her family and community were also proposed prior to program development (Sherraden, 1991). As mentioned above, these theoretical perspectives provided the impetus and design for the core functions of MIS IDA.

Developing a system in advance of or early in the process of program implementation has several advantages. It improves data integrity, reduces program costs, and enhances the extent to which data can be evaluated. Systems that are thoughtfully designed upfront can reduce data redundancy and long-term system maintenance by planning for the information needs of each component in a program. Moreover, developing a single MIS application enables integration of data collection, management, and reporting functions. The more typical pattern is that new systems are added on to existing systems or simply stand alone, requiring additional resources to develop and maintain. Program costs are reduced by developing one system to serve the needs of administration, service delivery, and evaluation. And the earlier a system is

developed, the sooner program workers are able to use it, facilitating program implementation and growth. Finally, baseline information is much more likely to be collected and to be accurate if the data collection system is ready at the start of the program.

Conclusion

The example of MIS IDA is notable for several reasons. First, the MIS design and development process was conceived and led by social work researchers then expanded to include all stakeholders of IDA programs. While it is advantageous to have social workers who understand computer technology, it is important to stress that technology is not a substitute for social work skills. MIS IDA's design process was heavily dependent upon community development techniques and an understanding of the role of the caseworker in assisting program participants. In addition, the availability of MIS IDA has created a stronger link between practice and research, with innovations in each area influencing the other. MIS IDA's success is due in large part to a design and development process that attempted to address the information needs of multiple partners with a single system. Collaboration led to the creation of practice guidelines and an evaluation agenda, which in turn was used to drive the structure and function of MIS IDA.

Second, collection, management and retrieval of information are critical tasks within any practice setting. When information processes are incorporated within a single MIS application that supports all areas of work, including administration, service delivery, and program evaluation, a practice system can emerge. MIS IDA is also an example of how a fully integrated system can be duplicated across a network of users. MIS IDA provides guidelines for program design, administration, and service delivery that are flexible yet offer some degree of standardization, which will allow for the application to function across settings and still provide quality aggregate data for evaluation. These "best practice guidelines" can be developed out of findings from previous evaluations and/or can be more theoretical in nature. By using best practice guidelines as the parameters for various functions within the MIS, it is possible to distribute them widely to the field.

Finally, to our knowledge this is the first time a MIS was developed and released proactively to evaluate a large-scale policy demonstration. The information collected through MIS IDA is currently aggregated to generate reports useful to policymakers (e.g., Sherraden, et al., 2000). Non-profit community organizations use such reports to develop stronger links to state and national policymakers and to attract more and larger funding resources.

As example of its success, MIS IDA is currently in use at most of the approximately 250 IDA programs operating throughout the United States and in use by at least 14 state-supported IDA programs. Reports from MIS IDA data have played a role in influencing 27 states to pass IDA legislation. In fact, several states have modeled their statewide program designs based on MIS IDA's embedded "best practice" design guidelines and many specify the use of MIS IDA to meet their program evaluation requirements (e.g., Task Force on Individual Development Accounts, 2000).

The impact of MIS IDA has reached beyond state initiatives. Federal IDA legislation was enacted through the *Assets for Independence Act* of 1998, calling for a five year IDA demonstration with \$125 million in funding (U.S. Congress, 1998). MIS IDA (or comparable software) was included in the regulations as a requirement for programs seeking to participate in this demonstration. Most significantly, MIS IDA data have influenced President Clinton's (2000) expanded proposal for matched savings.⁶

The example of MIS IDA highlights the potential for social workers to merge technological innovation with social work practice and policy innovation. The strategies offered can also be used to improve the conceptualization, development, and distribution of other technology innovations within social work.

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⁶ At the request of the White House and Treasury Department during Fall 1999, CSD provided MIS IDA data to the Clinton Administration. The findings from the first two years of the American Dream Demonstration, published in a report by Sherraden and colleagues (2000), showed that low-income IDA participants saved an average of \$33 per month, and the very poorest saved a higher proportion of their income than other participants. Subsequently, Clinton said in his State of the Union Address (2000):

Tens of millions of Americans live from paycheck to paycheck. As hard as they work, they still don't have the opportunity to save. Too few can make use of IRAs and 401(k) plans. We should do more to help all working families save and accumulate wealth. That's the idea behind the Individual Development Accounts, the IDAs. I ask you to take that idea to a new level, with new retirement savings accounts that enable every low- and moderate-income family in America to save for retirement, a first home, a medical emergency, or a college education. I propose to match their contributions, however small, dollar for dollar, every year they save.

Thus, data on IDAs from MIS IDA directly contributed to a major proposal on progressive savings policy. Vice President Gore, in his presidential campaign, has continued this initiative with his proposal for Retirement Savings Plus accounts. Connections between IDA research and policy are described in Sherraden (2000).

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Appendix A-1. Sample MIS IDA Report Distribution

MIS IDA Reports	<u>Distribution to Stakeholders</u>						
	Program Administrators	Participants	Funding Partners	Financial Institutions	Vendors	Researchers	Policy makers
Participant account statement	X	X					
Cumulative account activity	X		X	X		X	X
Account history	X	X		X		X	
Matched withdrawals	X	X	X	X	X	X	X
Participant demographics	X	X	X	X		X	X
Program design characteristics	X		X			X	X
Funder obligation dollars	X		X				
Program expenses	X					X	
Account discrepancies	X					X	
Monthly deposit patterns	X	X				X	
Closed accounts	X			X		X	
Case Notes	X	X					
Mailing labels	X						