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A MANAGEMENT INFORMATION SYSTEM FOR LOCAL GOVERNMENTS

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RATIONALE FOR DEVELOPING THE MANAGEMENT INFORMATION SYSTEM

We find two reasons to develop an improved management information system for local governments. One is the apparent inability of current local government management information systems to warn of imminent financial collapse or to indicate the degree of financial weakness of a local government. Another reason is the need for information that will promote the most efficient use of resources in providing public services.

During the 1970s certain local governments were unable to meet their obligations. Their current obligations exceeded current revenues. The nation was made aware of the crisis when New York City defaulted on some of its loan obligations and sought federal assistance. Other local governments have faced similar crises. Cleveland, Ohio, was in default for a short period during 1978 until it sold some of its assets (urban land and an electric power generating plant) to obtain cash and reduced its programs to reduce current outlays. The crises in those large cities have brought national attention to the financial problems of many local governments—urban and rural, large and small.

Financial problems of local governments developed over many years. High rates of inflation and high interest rates in the late 1970s only hastened the crises. Neither public officials nor the public had adequate financial information from their accounting system to realize fully the dangers of deferring payments for current expenditures. In some local governments, such as New York City, current revenues were insufficient to cover current expenses. The deficit was paid from short-term loans. Such financing of current programs is legal in a few states, but was done in other states that lacked adequate control. Many local governments had employee retirement programs with unfunded vested pension liabilities. For those local governments, today's retirement expenditures are really payments for

obligations incurred earlier when the retiree was an employee. The resulting impacts of prior deficit spending and of unfunded vested pension commitments were compounded by the lack in some local governments of accurate general financial information.

The second reason for developing a management information system is to provide a system that promotes efficient production of public services. Citizens appear to believe that local governments can and should be more efficient. This attitude is reflected in citizens' resistance to higher taxes (Proposition 13 in California) combined with citizens' demands for more and better public services. The Committee for Economic Development in its report *Improving Productivity in State and Local Government* identified four areas of opportunity to improve government efficiency: strengthening management, motivating the work force, improving technology, and increasing capital investments.

Two persuasive explanations for inefficiency in government are given by Niskanen and Stockfish. In his theory of bureaucracy Niskanen states that governmental administrators' individual professional welfare and prestige are directly associated with the size of the budgets for their agencies and not with the efficiency of the organization and operation of their agencies. Under those conditions such administrators, to maximize their individual well-being, seek to maximize the budgets for their agencies. To maximize efficiency in their agencies and to maximize social welfare for their constituents they would develop budgets that would ensure that the marginal cost to produce the last unit of each public service is equal to the marginal social value of that last unit. When their individual well-being is associated with size of the budget rather than efficiency criteria, public agency administrators have little incentive to consider marginal costs and marginal social values. Niskanen argues that legislative overseers of public agency administrations have neither the time

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nor the resources to test public agencies' budgets for efficiency and therefore usually approve budgets that enhance individual administrator's welfare.

Stockfish found a major flaw in Niskanen's theory in that Niskanen assumed public agency administrators know their most efficient production set. Stockfish states that this assumption is true only when public agency administrators have incentives similar to those of private firm administrators to find the most efficient production processes. Within the context of Liebensteine's theory of X-efficiency, Stockfish reasons that governmental agencies are inefficient because administrators of governmental agencies have few incentives to seek efficiency. Unlike managers of private firms, governmental administrators do not have the pressure of competition in a marketplace, do not have the right to capture the residual of revenue above expenditures—called profits in a private firm—for future expenditure or investment by the agency, and are not rewarded when they find more efficient production techniques. Rather, their future budgets may be cut on the grounds that the agency no longer needs so much money. Stockfish concludes that in those conditions public agency administrators deliberately manage the financial information given to the legislative overseers and the public to favor selection of a production process that is less than optimally efficient. Such a selection results in a supply curve for the agency that is to the left of and higher than the supply curve for the most efficient production process.

Though we recognize some validity in both Niskanen's and Stockfish's proposals, we contend that the lack of financial controls for governmental agencies is a more fundamental cause of governmental inefficiency. In our work with local governments in Kansas, we find that they have poorly developed management information systems. Single entry cash accounting is prevalent. Only recently have local governments been required to include in their budget reports to the state their expenditures by office. Frequently, the financial information kept by the local government is not current for decision making. The fact is that local governments in Kansas are not yet conforming to generally accepted accounting principles (GAAP).

Nationwide documental evidence can be found in a report by the accounting firm of Ernst and Whitney. They studied 100 U.S. cities with populations between 25,000 and 1,000,000. On the basis of their study they suggest (p. 1) that financial information reported by cities is deficient for two reasons: (1) the

relatively low level of compliance with GAAP in current financial reporting by cities and (2) inadequacies in financial reporting formats and measurement principles that underlie current GAAP for government.

Present Information Systems

In our research we found that Kansas local governments keep no accurate record of the costs of production. One reason for the lack of such cost records is that a governmental agency's existence, unlike that of a private firm, is not predicated on the condition that costs be controlled. The term "cost" should not be confused with expenditures. Expenditures are outlays for resources. Costs are the value of resources consumed to produce a product. The latter are linked to output, the former are not. Generally, the management controls of governments are not as well developed as those of firms in the private sector. Private firms have a direct incentive for financial controls. That direct incentive is the survival of the firm which depends on the ability of the firm to make a profit. The existence of a public agency is not predicated on the same conditions. Generally, expenditures are not made by a public agency to produce revenues. The agency's revenues are not associated directly with the output of the agency, but are based on a preconceived budget which has been estimated to cover the anticipated expenditures to provide a specific public service.

We conclude that better management information systems are needed by local governments to warn of financial difficulties and to promote improved efficiency in providing public services. We develop a management information system to meet those needs. In designing such a system one must recognize the conditions that such a system should satisfy.

Information for decision making in the short run. For decision making in the short run, the management information system must provide information on the full cost of resources consumed to produce a public service. If decision makers had comparable cost measures from other local governments that produce the same service, they would be able to study alternative production practices to find ways to improve productivity. Many such production adjustments could be made in the short run.

Information for decision making in the long run. Another need is to provide an environment that encourages local governments to make long-run decisions that improve productivity. Those decisions may be to increase capital investment or to invest in new technology or to invest in new organizational structure. Present budget controls operate as

though the agency or local government has only one more year to operate, which is seldom the case. The administrator lacks incentives to invest for future production because current management information systems are not designed to recognize the benefits of investing for the future. However, with the current lack of financial information voters probably are prudent to take the conservative approach that will yield underinvestment rather than to invest not knowing the value of such investments.

Such problems might be alleviated by reinstituting capital accounting. Currently, capital investments are charged as expenditures in the year they are acquired. No record is kept of the value of physical assets held by the local government and no depreciation is charged as physical capital is consumed.

Municipal accounting is a twentieth century development that began in Chicago. Early municipal accounting in Chicago was in the same form as private accounting—including capital accounting. A later view, attributed to New York City's Office of the Controller, opposed capital accounting for local governments. The argument was that the wealth of a city is not that shown on the balance sheet but what can be seen by looking at the city from the top of the hill. That concept has become the accepted basis of governmental accounting (see Green). Only recently has the accounting profession begun to reconsider this debate. The issue must be considered in searching for ways to improve the productivity of local governments.

Total focus on a one-year management horizon gives rise to another source of inefficiency—the difficulty of carrying unspent appropriations into the next budget year. Consequently, the marginal value of each dollar appropriated to an agency but not spent declines as the end of the budget year approaches. In some instances the marginal value of unspent appropriated money may turn negative near the end of the budget period. That is the case when an agency's future budget is reduced by the amount of unspent appropriated money at the end of the budget period, a practice that encourages the agency manager to spend cash balances just to avoid a potential budget reduction in future periods. Vendors have long recognized this phenomenon and seek to make additional sales to public agencies near the end of their budget period.

The preceding discussion provides a guide to our approach to designing a management information system. Management information systems are clearly needed to provide sound financial data and to promote higher productivity in local governments. We believe that developing such a management information

system would be an investment in new technology and should contribute to strengthening management in local governments.

THE ELLIS COUNTY MANAGEMENT INFORMATION SYSTEM

In 1975 the commissioners of Ellis County, Kansas, invited the Kansas Agricultural Experiment Station to develop a new management information system for Ellis County that fulfilled the objectives stated in the preceding section. The initial purpose was to design an informational system that would provide management information more consistent with statutory requirements. Certain other functions of the county that involve considerable information handling also were to be incorporated into the system. We agreed to develop a management information system that included a fund accounting system to perform cost accounting, a system to handle property taxation, and a system to handle voter registration.

The system was designed for small- to medium-sized local governments. Such local governments, like small businesses, do not have the resources to develop their own technology. Agricultural experiment stations and land grant universities have the potential to develop technology for rural local governments just as they have done for farmers.

The first product of our work was a report on the organization and operation of Ellis County's government. It was based on interviews with the county officials and studies of Ellis County's documents and procedures. Simultaneously, we studied the Kansas Statutes Annotated to identify statutes relevant to the management of a Kansas county. More than 5,000 paragraphs were identified as relevant. Ellis County's operation and organization were tested against those statutes. In those cases where the county's operation was not consistent with state statutes, we consulted with county officers to reconcile the differences.

The second product from our work in Ellis County was a restructured management information system. It consisted of procedure manuals for the restructured system and of computer software to perform the necessary data processing. The software is written in PL/1 and is designed to run on IBM OS system. It requires 256K of memory, a disk drive, and two tape drives. A computerized sort routine is required. Ellis County has access to the system from a remote job entry terminal in the courthouse. Most print jobs are done at the terminal but the large print jobs are done at the central computer and sent to the county.

The Ellis County Management Information System has five subsystems: a name file subsystem, a taxation subsystem, an accounting subsystem, a payroll subsystem, and a voter registration subsystem. The financial portion of the whole system is designed to leave an audit trail. The accounting and payroll subsystems are designed to conform to the accounting principles as given in *Governmental Accounting, Auditing, and Financial Reporting*. All subsystems are designed to conform to the Kansas statutes.

Name File

The name file is a computer-maintained list of the persons, firms, and organizations with which the county conducts transactions. The list includes directory information such as the name, address, and identification number of each entity recorded. The name file is a supporting subsystem to the taxation subsystem.

Taxation File

The taxation subsystem begins with property appraisal. We redesigned personal property appraisal forms to be compatible with the procedure used to key appraisal information to the computer. A computer program permits ready updating of appraisal data on the computer files. Another program is used to maintain the real estate appraisal file. When a parcel changes ownership or value, that program can be used to change the data for that parcel. A series of computer programs is used to prepare the real estate and personal property tax rolls, to prepare tax statements, and to set up the taxes receivable accounts. Two special features of the taxation subsystem are: (1) when a taxpayer requests that the tax statement be sent to another party, the system addresses the statement to the designated taxpayer but addresses all delinquent tax notices to the owner and (2) the system lists up to 10 separate personal property items on one tax statement and each tax liability may be from a different tax unit in the county; thus the number of Ellis County's personal property tax statements is reduced by half. The tax system also has programs to abstract tax amounts by taxing districts and to process tax accounts that are delinquent.

Accounting System

The accounting subsystem is a double entry fund accounting system in which the transactions are recorded by office or department

making the transaction and by activity or job within the office or department. It is designed for cost accounting by cost centers (offices or departments) and by jobs within the cost centers. The accounting and payroll subsystems together permit cost accounting for labor services employed on each job as well. By distinguishing between internal and external transactions, the subsystem makes possible the preparation of a consolidated operating statement for the local government. Accounting for capital and for depreciation on capital owned by the local government used to produce public services is provided in the accounting subsystem.

The accounting subsystem consists of a procedures manual, a set of originating instruments on which transactions are recorded, and computer programs to process the accounting data. Sets of codes have been designed to identify accounts. Fund, office, and job codes are specified by the user. Each transaction is entered on the appropriate originating instrument, keyed to the computer, and processed. A different type of originating instrument has been designed for each major type of transaction. For example, a purchase is recorded on a purchase voucher. When the transaction is keyed and processed, the program recognizes it as a purchase and makes the appropriate accounting entries according to the accounting rules for processing information on a purchase voucher.

Current and previous account balances and transaction data are stored on computer files. Account balances can be printed to determine the status of any fund. Original transaction data are stored and used to verify the current account balances and to prepare special reports such as an expenditure report for a fund, or an office, or a job in an office.

Payroll

The payroll is processed through a payroll agency fund. Labor service expenditures are recorded in the accounting subsystem as transactions between the payroll agency fund and the funds from which labor services and associated fringe benefits are paid.

Voter Registration

The voter registration subsystem is independent of the other subsystems. It is included because it has data processing characteristics similar to those of the other subsystems. It is used to maintain the voter registration file and to print the various registration documents as needed.

POTENTIAL TO EXTEND SYSTEM TO OTHER LOCAL GOVERNMENTS

We began work on the management information system in 1975. Only recently has the system become fully operational and Ellis County has not had enough experience with it to determine its effectiveness. We describe some results that have been realized and potential results expected to be realized in the future.

First, our management information system can be viewed technically as a data-handling system implemented by computer. One of the first questions in considering a computer operation is, "How much money will it save?" We do not argue that the system will reduce data-handling costs. We contend that our system produces better quality and more timely data that can be used more effectively in decision making. The computerized system replaces a single entry accounting system that provided little more than confirmation that money was spent legally in Ellis County. Single entry systems provide less protection against data errors. Also, the previous management information system was not standardized. Lack of standardization of procedures makes it difficult to trace mistakes in data processing. Before, the county on occasion had to hire an auditor to reconcile the books. We find that the county clerk and the county treasurer are having fewer such problems with the new system. Reducing the cost of outside accounting help is a savings to the county. Standardization of procedures and a double entry system contribute much to the improvement.

When we began work in Ellis County, the county held money in many different checking accounts. Separate checking accounts were used to segregate cash. We convinced the county treasurer to consolidate all checking accounts into one account and to initiate a more active cash investment program. In 1979 the county's cash investments yielded more than \$200,000 in revenue. With continued use of the management information system, we expect additional improvement in cash management. An improved record of cash flows will provide the treasurer better information for cash management. The new system allows for encumbering major expenditures including payroll expenditures. Previously the county had no continuous encumbrance system. Encumbrances were calculated by the auditor at the end of each budget year so as to adjust next year's books for expenditures already committed.

One goal of the Ellis County Commissioners was to decentralize financial management. They wanted each office to be responsible for its own financial management after the money

had been appropriated. With the old system expenditure records for each office were not kept. The commissioners were fully responsible for financial management. With the new system, officers and the commissioners receive monthly reports on the status of the budget in each office. Each office is expected now to manage its own budget. Unanticipated overspending is not tolerated by the commissioners. Each office has greater freedom to decide how to do its own work. With the new reports the commissioners can give greater freedom to the officers, yet have better control over the budget than before.

A crucial activity in any government is the development of the budget for the next year. In the past the commissioners and other officers had such poor financial information about the current and past years that the budgeting was turned over to a hired auditor. The information now received enables the commissioners, the other officers, and the public to enter into a more enlightened debate over the proposed budget.

We perceive that the process of developing the management information system with the county has led to higher levels of understanding among county officials of how their county government functions and of the financial status of their county government. Our first task was to develop a detailed description of the structure and operation of Ellis County government. County officials have told us that our reports helped them to understand more fully the operation of their county government. In 1975 the attitude of many county officials was that the budget was a constraint to the performance of their work. Ellis County officials now generally see the budget as something to be managed. We believe that the level of management skills in Ellis County is higher today in part because of our work.

It is too soon to realize other results from the use of the system. We expect that job accounting within offices will produce better information on the cost of providing specific services. We did not encourage job accounting until the offices had gained experience with the system, but that point has now been reached. When offices use job accounting, reports can be obtained showing all expenditures by job regardless of the fund from which the expenditure was paid. Because many activities are supported from more than one fund, such reports should be a useful way of showing the full expenditures.

In our discussion of the reason for developing the system we mentioned capital accounting. Our system permits capital accounting—something that the county will use in the future as it becomes more adept at using the

system. Ellis County has never done capital accounting. We designed the accounting system to be versatile; the local government can use it for simple fund accounting or for more elaborate accounting procedures.

The system can be adopted immediately by any Kansas county. In Kansas only the counties handle property taxation and voter registration and thus those components are not useful to other local governments. The accounting system and the payroll system could be adopted by counties, school districts, and special districts in Kansas.

We suspect that, because tax laws and voter registration laws differ among states, the system would need modification before being used in another state. We believe that little or

no modification would be required for the accounting and payroll systems.

The computer system was designed for batch use. Although many county officials are impressed with interactive system demonstration, we do not believe that counties can afford such systems at this time.

SUMMARY

Local governments clearly need better information systems. We think that the Ellis County Management Information System will provide much improved management information. Furthermore, our experience in developing the system may be useful to persons who wish to do similar work in other states.

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