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Data Processing Analysis and Recommendations for Dawson County, Nebraska

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FOR DAWSON COUNTY, NEBRASKA

March, 1984

Center for Applied Urban Research
University of Nebraska at Omaha

ACKNOWLEDGEMENTS

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I. Introduction

This report presents an analysis with recommendations regarding the data processing needs of Dawson County, Nebraska. It was undertaken pursuant to a contract dated November 7, 1983 between the Center for Applied Urban Research of the University of Nebraska at Omaha and the Dawson County Board of Supervisors.

This report reviews the current state of data processing in Dawson County government, the county's information management data processing needs, and the applicability of contemporary computer technology to these needs. It also presents a recommended configuration and cost for computer systems to meet these needs.

II. Contemporary Computer Technology

Recent advances in technology have brought computers within the reach of many local governments in America. These advances have substantially reduced the cost of computer systems and have also made it possible for local government personnel who are not data processing experts to use computers effectively with little additional training.

One such advance has been the tremendous reduction in the physical size and cost of computers coupled with dramatic increases in their functional capabilities. Second, the current

generation of application programming or software available to local governments is characterized by flexibility and "user-friendliness." That is, the programming is designed for interactive use on video terminals by personnel with little or no knowledge of computer technology or programming.

One result of these changes is that small local governments can acquire and use computer systems to assist the performance of everyday activities and can do so with a high degree of confidence and at a relatively low cost.

III. Acquiring the Technology

Regardless of the type of hardware, a computer system should be viewed as a tool to be used just like any other piece of office equipment. It is an integral part of the work routine, just like the typewriter, the calculator, or the filing cabinet.

Computers are technically feasible in almost all organizations. Technical feasibility, however, is often less important to local governments than several other factors. These include:

* Cost. Cost is perhaps the best understood and most definitive means of determining the feasibility of any new system. Is the new system more or less expensive than current methods? However, although cost may be the best understood criterion for determining feasibility, accurate cost estimates, especially in relation to benefits that may not be quantifiable (e.g. service improvements), are often difficult to obtain. This is so particularly in counties with limited current data processing capability.

A word of caution is in order here. Few local governments that implement computer technology can expect to reduce overall costs. Thus, a strict cost justification for a data processing system may be impossible. At best, a local government can anticipate cost displacement (e.g., the moving of costs from one place in the budget to another) or cost avoidance (e.g., the use of more efficient technology to prevent, avoid, or move into the future costs that would otherwise occur).

* Ease of Operation. Some computer systems can be operated only by technically trained personnel. A factor in favor of many systems based on the current technology, especially the present generation of mini- and microcomputers, is that local government personnel who are not trained in the technology can easily operate these systems, and a technical staff of programmers is not required.

* Available Programming. The availability of proven, easy-to-use software or programming to make a computer system do what a local government wants, when it wants, and how it wants is crucial to system feasibility. Without adequate software, a computer is only an expensive box that fulfills no useful purpose. Software is available in most functional areas of local government from a variety of sources.

* Growth. An important factor in the feasibility of a data processing system is the extent to which it can grow to meet future requirements. Not only should the system be

capable of accepting more sophisticated uses (software) and
equipment (hardware), but it should also accommodate normal
growth in county activities.

* Staff Considerations. The degree of acceptance of computer
technology within a local government is a significant con-
sideration in system feasibility. Similarly, the degree of
competence to perform specific local government functions
(e.g., accounting, payroll, utility billing), aptitude, and
enthusiasm for the use of computers can be constraints on
system effectiveness. To put it more plainly, staff sup-
port for computerization, competence in key positions that
will rely on computer technology, aptitude for using auto-
mated equipment, and interest or enthusiasm for automation
are very important to the effective implementation of a
computer system in local government.

* Political Feasibility. Finally, political feasibility may
be the single most critical element in the success of
computerization in a local government. It is also the most
difficult factor to understand and manage. Political
feasibility means the extent to which local elected offi-
cials and administrators understand and support the need
for an electronic data processing system and the extent to
which independently elected officials can put aside dif-
ferences and agree to cooperate in the acquisition and
implementation of automated systems. In the absence of
such support and/or cooperation, a local government would
be well advised not to proceed with system procurement. On

the other hand, the support of these persons can help immeasurably to ensure smooth system acquisition, installation, and operation.

Once a local government has reviewed these factors and determined both the need for and feasibility of acquiring new or enhancing existing automated data processing technology, a systematic procurement plan should be adopted. Such a plan should include the following steps:

1. A data processing requirements analysis and feasibility study should be undertaken. For Dawson County, this report represents such a study.

2. Shortly after review of this report by county officials, they should decide whether to acquire a computer system based on the recommendations contained in this report.

3. If the county decides to acquire a system, a Request for Bid or Proposal (RFP) to meet the requirements identified in this study will be developed and submitted to data processing vendors.

4. Proposals received by the county will be evaluated and a selection made of two or three finalists for additional consideration.

5. County officials will be asked to approve the selection of finalists and to authorize further evaluation of these proposals, including visits to local governments having systems installed by the finalists.

6. Site visits and detailed evaluations of the finalists' proposals will be made and a system vendor selected.

7. A contract will be negotiated with the vendor selected.

8. Finally, system installation, testing, and acceptance will complete the procurement plan.

This procurement plan is recommended for use by Dawson County as a method proven effective for computer system acquisition in numerous local governments throughout the country.

IV. <u>Current Data Processing in Dawson County</u>

The current level of data processing in an organization, whether manual or automated, is an indicator of the organization's need for improved technology. It also provides insight into potential problems that may arise with implementation of newer technology. A review of an organization's data processing operation also allows the development of a cost analysis that can be used, in part, to suggest whether new or enhanced data processing capabilities are justifiable.

The following pages present a brief overview of current data processing activities in Dawson County. Information for this section of the report was provided by Dawson County officials during interviews by CAUR researchers.

A. <u>Functional Areas Using Automation</u>

1. <u>County Clerk</u>

All functions of this office of county government are conducted manually. That is, the office currently makes no use of computers or automated data processing.

The primary functions of this office are:

      payroll (for 170 employees)

      payment of all invoices

      budget preparation

budgetary accounting

motor vehicle titles

recordings (of various types of documents, etc.)

uniform commercial code filings.

The county clerk indicated interest in automation of payroll, budgetary accounting, invoice payment, and especially motor vehicle titles.

2. County Treasurer

The county treasurer performs functions primarily associated with the collection and distribution of revenues. These include:

tax collection, distribution, and accounting

motor vehicle registration.

The treasurer's office also issues drivers' licences but this is done manually.

This office posts receipts using two Olivetti electronic posting machines, one for real estate and one for motor vehicle registration. A Burroughs L-8000 ledger card bookkeeping machine is used to record revenue collections and make tax distributions. This machine was purchased in 1974 for $15,000, including programming, and $1,400 is spent on it annually for maintenance. (This results in a five-year cost for the system of $22,000, assuming no maintenance cost increases and no future programming changes.) According to the treasurer, it is quite serviceable.

The treasurer was less than enthusiastic about this study of the county's data processing needs and about any changes in automation in his office. In fact, the treasurer repeatedly stated

his unwillingness to participate in the automation of his activities if this would involve either substantial modification of his current procedures (especially those involving real estate tax collection), extensive cooperation with the county assessor, or use of the State Department of Revenue's on-line CAPS system. He indicated that he might be willing to have the motor vehicle registration function automated but not through the CAPS system.

The treasurer's position on future automation of Dawson County offices and activities may preclude acquisition of an integrated data processing/information management system for the county should one be determined to be warranted. The reason for this is that the treasurer's functions are integrally related to those of the clerk and assessor, especially in the areas of taxes, motor vehicles, budgetary accounting, and invoice payments. Should any one of these offices seek its own independent solution or be unwilling to cooperate with the other offices regarding automation, then an automated system that integrates the separate but related activities of all three offices would not be feasible.

This is unfortunate for at least three reasons. The first is that an integrated system would streamline these functions, make their performance more efficient, and promote the more timely provision of more complete financial information to the county board.

Second, any cost benefits or economies of scale that might accrue from use of a single, larger, integrated computer system

for all county offices would be lost, and potentially excessive costs would be incurred through use of several smaller systems.

Third, the generation of technology represented by the Burroughs L-8000 is considered antiquated. It is an essentially single user, single function system and has very limited expandability. A machine of this vintage can be expected to experience increasing amounts of down-time. Service will become increasingly expensive and harder to acquire until, in a relatively few years, the L-8000 will require replacement. Indeed, due to its age and the generation of technology it represents, projecting future costs and service life for such a machine is very difficult.

3. County Assessor

The county assessor's office is partially automated through the State Department of Revenue's CAPS system at an annual cost of $22,656, including communication cost. This automation involves use of two on-line terminals, connected via dedicated telephone lines to the state system in Lincoln, for creation and maintenance of real and personal property and records, tax appraisal, and creation and printing of tax bills. The assessor's office also manually prepares motor vehicle registrations.

The assessor is quite satisfied with the capabilities provided through the CAPS system. She also indicated that although she does not oppose acquisition of an in-house computer system by the county, she would be unwilling to sacrifice any current

advantages of the CAPS system to an in-house computer and would only consider one if it provided service equal to or an improvement over CAPS.

4. Register of Deeds

The primary responsibilities of this office are the maintenance of official records regarding real property in Dawson County. These are maintained in large ledger books and all documents are being recorded on microfilm.

The index of property records maintained in this office should be considered for automation. This may require installation of more than one computer terminal (CRT) for use by persons desiring to access these records due to the heavy volume of such activity. Automation of the real property records cannot be considered due to a state law that allows such automation only for the state's three largest counties.

5. Clerk of District Court

The clerk of the District Court has the responsibility for maintenance of all District Court records including criminal and civil records, the receipting and reimbursement of all child support and alimony, and the selection and organization of juries.

This office maintains records manually on approximately 6,000 cases. In 1983, 425 new cases were added. Approximately 500 to 600 child support checks are typewritten monthly. Additional child support tasks include preparation of receipts, check stubs and posting in the case ledger, appearance docket, and fee book. Furthermore, state law requires calculation of daily compounded interest on child support funds that are delinquent 30 days or

longer. This computation is currently done manually by the county attorney's office.

This office also prepares and submits claims for juror fees to the treasurer's office for payment. Juries are selected from lists of names provided by the election commissioner's office.

All of the above mentioned functions are handled manually by the clerk and four other staff members. These functions could be performed more efficiently with an automated system. This is especially true for the handling of child support payments. At present, the calculation and accrual of interest (compounded daily) on delinquent child support payments is not being done by the District Court clerk's office due to the volume of work in the office and the difficulty of the task. The county attorney's office calculates interest amounts in cases where prosecution is being considered or pursued.

The clerk is supportive of automation of the office and lists child support records and word processing as priorities.

6. Country Attorney's Office

The county attorney's office acts as both civil and prosecuting attorney for Dawson County. The responsibilities of this office include prosecution, review of police and state patrol reports, and filing of charges in County Court. This office also maintains records on 300 active cases of nonpayment of child support and sends about 200 letters per month to persons who are delinquent in their child support payments. In addition, records are maintained on about 30 bad checks per month that have been returned unpaid to merchants due to insufficient funds. Other

than child support and bad check cases, about 20 to 30 legal cases are handled monthly by the staff of two attorneys and two secretaries.

This office currently has no automation but would like to automate several functions. One priority is automation of the criminal history file for Dawson County. Another is the child support records which interface with the clerk of the District Court and the State Department of Welfare.

Automation of child support records, maintained in the clerk of District Court's office, appears to be eligible for up to 70 percent reimbursement from state and federal welfare departments. Since hardware, software, and other related supplies and personnel are eligible for this reimbursement, the possibility exists that child support functions in both the clerk of District Court's and county attorney's offices could be at least partially reimbursed by federal and state funds.

Other priorities for automation are word processing and bad check records.

7. Sheriff's Office

The sheriff's office employs 13 sworn officers, seven civilians, and one reserve officer (in the corrections office). It also maintains a jail facility with an average daily population of 20 persons (either being held or serving terms), and keeps about 545 jail records.

Records are also kept on about 500 local wants and warrants and 2,300 civil processes. This office prepares numerous reports

each month, including fee and collection reports to the county commissioners and crime reports to the state and FBI. This office has access to the National Crime Information Center through teletype.

Currently, all of the records in this office are manually maintained, and reports are typewritten. This manual system is very time-consuming for the staff and results in a one-month lag time for some reports. Currently, up to five manual files must be accessed to check the criminal history of an individual. In addition, warrant records are not currently filed by misdemeanor or felony categories but are combined into one single file. Maintenance and access to these types of records as well as report preparation could be done in a more efficient and timely manner by computer.

The sheriff favors automation for his office. His priorities for automation are: 1) terminal access to motor vehicle registration and drivers' license files, 2) criminal history file, 3) civil process records, which include all civil papers from the courts, 4) warrant records, and 5) complaint records.

8. Election Commissioner's Office

This office is responsible for registration of new voters and administration of elections. In addition to the commissioner, one full-time and one part-time worker are employed during peak months. Currently, voting and tabulation of ballots is automated using a punchcard system. The office has seven CES ballot counters purchased in 1978 and 1980 for a total cost of $11,400. In addition, 128 voting machines were purchased for a total of

$30,475, and 22 demonstrator machines, which instruct voters on how to operate the voting machines, were purchased for $1,320. One ballot crimper was purchased for $1,285. Annual maintenance costs for this equipment are $612. The office pays $4,100 annually to CES for programming of the ballots.

The voter registration list is currently maintained manually, which involves considerable time and does not allow for easy updating. Election results and reports of party membership of voters are also prepared manually.

This office is interested in further automation, although concern was expressed for the need for adequate training on any new equipment. Priorities for automation include the voter registration list and election results. Automation of the voter registration lists would also assist the clerk of District Court's office, which uses voter lists for jury selection purposes.

9. Highway Department

The principal responsibilities of this department include construction and maintenance of county roads and bridges, installation and maintenance of county highway signs, and snow plowing. The department owns approximately 80 vehicles. All information management activities in this office (record keeping, reporting, etc.) are performed manually.

The department is supportive of automation and listed the following functional priorities: equipment management, sign inventory, road inventory, bridge inventory, materials inventory

(tied in to purchasing), billings (to individuals for the rate of materials and to other county departments for vehicle maintenance and gasoline), and word processing.

10. County Surveyor

The county surveyor is responsible for conducting land surveys in Dawson County. Approximately 30 surveys were conducted in 1983, the majority for title insurance purposes relating to land transactions.

This office currently uses an HP 85 (Hewlett Packard model 85) microcomputer for performing various calculations associated with land surveying. The system is owned through a four-year lease/purchase agreement at a cost of $123.00 per month (total cost of $5,904). The agreement ends in 1985.

The HP 85 is an older piece of equipment with programming and functional limitations such that certain types of data storage and calculations required by this office cannot be performed on it. It also is a very specialized piece of equipment that other offices in the county will be unlikely to use currently or in the future. In addition to the functions performed on the HP 85, the surveyor's department could benefit from the use of a word processing capability, especially for typing legal descriptions on survey records and reports.

11. County Weed Control Office

This office is responsible for weed control on public and private property in the county. It has seven vehicles equipped for weed spraying and a chemical inventory. The office bills for spraying of weeds on private property (over 600 bills in 1983)

and has its own equipment maintenance shop.

The department is interested in automation of billings, inventories, and equipment records.

V. Basic Applications to Consider for Computerization

A. Introduction

The current generation of data processing technology, including both micro- or minicomputers, permits and encourages functional and data base integration and allows for the performance of multiple functions by multiple users. For example, the county treasurer could create a motor vehicle registration file and allow access to this file (for inquiry purposes but not for purposes of entering or changing records) to the sheriff via a terminal in the that office. Similarly, the work of the register of deeds, assessor, treasurer, and clerk could be integrated and streamlined using modern technology. This would involve the activities of tax assessment, tax roll preparation, tax billing and collection, tax disbursement, and financial accounting. In each of these cases, more than one person in more than one county office could perform a variety of functions simultaneously on the system and not interfere with the activities of others.

Modern computer systems that should be considered by any local government should include the following features:

Transaction oriented--When a transaction such as updating the accounts receivable file is made by the county treasurer, the system accepts the transaction and automatically updates all affected ledgers and funds. This would, for example, permit

automatic tax receipt distribution to the proper funds and accounts upon the entry of tax receipts into the system and would also provide for an audit trail of these transactions.

On-line--Computer terminals and printers in the various offices would be physically connected thus providing instant access to the system by all users.

Real time--Processing on the system occurs at the time a user begins to work at a terminal. The creation of punch cards or other input type documents to run through the system at a later time would not be needed.

Multi-user and multiprogramming--Several persons in different offices could perform different functions on the system at the same time. The system would also allow users to under-take unique inquiries and generate unique reports using English-like commands.

With these system requirements in mind, several functional areas in Dawson County could be considered for automation using either a distributed network of microcomputers or a single multi-user, multiprogramming minicomputer with terminals and printers in all relevant offices.

B. Recommendations

The use of automation in Dawson County, with the exception of the county assessor's office, is minimal. This is partly due to the county's size (22,304 population) and the historic reliance of small governmental units on manual information processing methods.

However, in Dawson County, another factor must be noted. That is the apparent lack of cooperation on the part of certain of the county's independent elected officials and the unwillingness of these officers to change procedures in order for the county to implement an integrated, county-wide information management system.

Ordinarily in a study of this sort, CAUR would make recommendations concerning functional areas to consider for future county-wide automation. Typically, these activities are associated with financial management functions that are performed in the offices of county assessor, clerk, and treasurer. However, the interoffice complications noted above appear to preclude a recommendation involving an integrated, county-wide system. This is because to do so would either produce greater conflict than presently exists--if an integrated system were recommended for these offices, or promote an increase in the inefficiency of operations in these offices--if separate, non-integrated systems were recommended.

To make the best of this situation, the following relatively non-controversial actions can be taken to improve information management in Dawson County.

1) County Assessor. Continue use of the CAPS system for property records and property tax billing. This office should also consider use of forthcoming CAPS programming for motor vehicle assessments when this programming becomes available.

County officials should be aware, however, that current costs ($22,656 per year) can be expected to increase due to the

probable increase in communication (telephone line) costs in future years and also because of the addition of motor vehicle titles programming. Not counting any future cost increases, current five-year costs for this office total $113,280. When combined with the $22,000 cost of five-year operation of the system in the treasurer's office, this produces a total of $135,280.

2) County Clerk. Consider acquisition of a microcomputer system (hardware and programming) for the following functions:

payroll

budget preparation

budgetary accounting

accounts payable

word processing.

3) County Treasurer. Continue present operation.

4) County Assessor. Continue present operation.

5) Sheriff. Continue present operation.

6) Election Commissioner. Continue present operation.

The reason no recommendations are made for these offices is that no changes in their present data processing/information management activities appear warranted in the absence of an integrated, county-wide system.

7) Surveyor. The surveyor should investigate the availability and cost of an upgrade for his existing microcomputer.

8) Highway Department. Consider acquisition of a microcomputer for the department for the following functions:

various inventories (using a file manager/data base manager)

equipment management

word processing.

9) Weed Control. Use the highway department's micro for word processing, inventory maintenance, and equipment management.

10) Clerk of District Court. Acquire a microcomputer based system for the management of this office's child support function.

11) County Attorney. No recommendation. This office can receive reports on child support from the clerk of District Court's microcomputer system.

C. Hardware Configuration and Estimated Costs

Recommended hardware configurations and cost estimates are provided below for the four offices for which new equipment and programming have been recommended.

1. County Clerk

Equipment:	Microcomputer with 256K to 512K of main memory, video monitor, 10 MB disk storage, dot matrix or letter quality printer

Cost:

Hardware	$ 8,000
Software	6,000
	$14,000

Maintenance/support: $ 400 per year--disk drive only

2. Surveyor

    Equipment: Microcomputer with engineering and surveying calculation programming, with 128K to 256K of main memory, video monitor, dot matrix printer, and dual floppy disk drives.

    Cost:

        Hardware: $ 5,000
        Software: 2,000
                         $ 7,000

    Maintenance/support: None recommended.

3. Highway Department

    Equipment: Microcomputer with 128K to 256K of main memory, video monitor, dot matrix or letter quality printer, and dual floppy disk drives.

    Cost:

        Hardware: $ 6,500
        Software: 2,500
                         $ 9,000

    Maintenance/support: None recommended.

4. Clerk of District Court

    Equipment: Same hardware configuration as county clerk.

Cost:

Hardware:	$ 8,000
Software:	4,000
	$12,000
Maintenance/support:	$ 400 per year--hard disk drive only

Total Costs:

	Purchase	Annual Maintenance
County Clerk:	$14 000	$ 400
Surveyor	7,000	-0-
Highway Department	9,000	-0-
Clerk of District Court	12,000	400
	$42,000	$ 800

The estimated five-year cost of these systems is: $42,000 plus $4,000 ($800 per year times five years) = $46,000. To this figure must be added the estimated $135,280 for existing equipment and systems in the assessor's and treasurer's offices, producing a total estimated five-year cost of $181,280.

This compares to the estimated five-year cost of approximately $200,000 for automation of the principal offices in a county in eastern Nebraska and $240,000 for automation of the principal functions of a city in western Nebraska. These systems involve several computer terminals and printers in various offices as well as fully integrated software.

VI. Alternative Methods of Acquiring Computer Technology

A. Basic Alternatives

Ordinarily, local governments can acquire the required computer technology by three basic alternative methods. This is so whether they choose micro- or minicomputer based systems. These alternatives are:

* Rely on outside service bureaus for data processing. These agencies can be used to provide either "batch" or "on-line" data processing services. The county is presently using the service bureau approach in the assessor's office. For certain of the functions (e.g., payroll, budgetary accounting, accounting for child support payments) in the offices for which automation is recommended herein, service bureau support may be available through local banks or accounting firms.

* Acquire in-house computer hardware and hire technically qualified programmer-analyst staff to develop application software (programming) for the system. The expense of this approach, the length of time required to develop needed programming, and the risks involved in in-house program writing should cause it to be ruled out as not cost effective.

* Acquire fully programmed and supported systems, including both in-house microcomputer hardware and software, to meet the requirements of each of the county offices for which automation is recommended.

B. Recommendation

For the reasons discussed earlier regarding lack of interoffice cooperation in Dawson County, this study recommends that

the county board authorize acquisition of fully programmed and supported microcomputer based systems for the offices of county clerk, surveyor, highway department, and clerk of District Court to perform functions discussed herein. This study further recommends that Requests for Bid or Proposal (RFP's) be developed to solicit proposals from vendors offering such systems.

With the exception of the system for the surveyor, all equipment should be compatible in order to provide an in-house backup capability in the event a system or equipment device should break down.