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Data Processing Analysis and Recommendations for the Ashland-Greenwood Public Schools Ashland, NE

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**DATA PROCESSING ANALYSIS AND RECOMMENDATIONS
FOR THE ASHLAND-GREENWOOD PUBLIC SCHOOLS
ASHLAND, NEBRASKA**

**David R. DiMartino
Donald F. Norris**

June, 1983



**Center for Applied Urban Research
University of Nebraska at Omaha**



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DATA PROCESSING ANALYSIS AND RECOMMENDATIONS
FOR THE ASHLAND-GREENWOOD PUBLIC SCHOOLS
ASHLAND, NEBRASKA
JUNE, 1983

I. Scope and Purpose

This report presents an analysis with recommendations regarding the administrative data processing needs of the Ashland-Greenwood Public Schools in Ashland, Nebraska. The analysis was undertaken pursuant to a letter of March 11, 1983 from the Center for Applied Urban Research of the University of Nebraska at Omaha to the school superindendent.

The broader effort within which the analysis of the Ashland-Greenwood Schools' data processing requirements has been undertaken is supported by the W. K. Kellogg Foundation. The Kellogg effort involves research into the uses of microcomputers by small and rural local governments and the development of training and technical assistance materials to assist local governments to acquire and use microcomputer technology more effectively. Demonstration sites for this project include the city of Gordon, Nebraska; Butler County, Nebraska; and the Ashland-Greenwood Public Schools.

This report will provide Ashland-Greenwood Schools' officials with information on the current status of

administrative data processing in their organization and their future needs. The report will also discuss the applicability of microcomputer or other computer technology, the probable configuration and cost of a computer system to meet these needs, and recommendations concerning future action by the school system in the area of data processing.

II. Microcomputer Technology

Recent advances in technology have brought computers within the reach of many local governments and school districts in America. These advances have substantially reduced the cost of computer systems and have also made possible effective computer use by personnel who are not data processing experts.

The first advance has been a tremendous reduction in the physical size and cost of computers coupled with dramatic increases in their functional capability. Second, the current generation of application programming, or software, is characterized by flexibility and "user-friendliness." That is, the programming is designed for interactive use on video terminals by personnel who have little or no knowledge of computer technology or programming. One result of these changes is that school districts today can acquire and use computer systems to aid in performing everyday activities and can do so with a high degree of confidence and at relatively low cost.

The third major advance has been the introduction of the microcomputer. These small, inexpensive, yet relatively powerful machines, when coupled with appropriate software, can become significant tools in the performance of basic administrative functions.

Microcomputers can be used as "personal" computers. That is, they can be single user, single function machines --somewhat analogous to the telephone or adding machine, or they can be used by several persons to perform a variety of activities. Certain microcomputers can also be linked together to form local distributed processing networks of small machines.

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 telephone, the adding machine, or the filing cabinet.

Computer usage is technically feasible in almost all organizations. Technical feasibility, however, is often less important to school districts than several other factors including:

* 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? Although cost may be the best understood

criterion for determining feasibility, accurate cost estimates are often difficult to obtain, especially in organizations with limited current data processing capabilities.

A word of caution is in order here. Few organizations that implement computer technology can expect to reduce overall costs. Thus, a strict cost justification for an electronic data processing system may be impossible. At best, an organization 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 the current technology, especially the present generation of mini- and microcomputers, is that in many cases 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 an organization 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 many administrative areas for local governments and school

districts from a variety of sources and needs to be considered prior to hardware considerations.

* Growth. An important factor in the feasibility of an electronic data processing system is the extent to which it can grow to meet future organizational requirements. Not only should the system be capable of accepting more sophisticated uses and equipment (hardware) but also of accommodating normal growth in the volume of activities.

* Staff Considerations. The degree of acceptance of computer technology by school district staff is a significant consideration in system feasibility. Similarly, the degree of staff ability to perform specific administrative functions (e.g., accounting, payroll, etc.) and staff aptitude and enthusiasm for the use of computers can be constraints on system effectiveness. To put it more plainly, staff support for computerization, competence in positions that will rely on computer technology, aptitude for using automated equipment, and interest or enthusiasm for automation are most important to the effective implementation of an administrative computer system in a school district.

* Political Feasibility. Finally, political feasibility may well be the single most critical element in the success of computerization in a public school system and the most difficult factor to deal with. Political feasibility means the extent to which school officials and

administrators understand and support the need for an electronic data processing system. In the absence of such support, a school district would be well advised not to proceed with system procurement. On the other hand, the support of these persons can help immeasurably to ensure the smooth acquisition, installation, and operation of a system.

Once a school district has reviewed these factors and determined both the need for and feasibility of acquiring new or enhancing existing automated technology, a step-by-step procurement plan should be adopted. This study of the Ashland-Greenwood Public Schools' current data processing requirements is the first step in such a plan. It will, in turn, lead to the following activities in order of occurrence.

- * A decision by school officials about whether to acquire a computer system based on the recommendations contained in this report. This decision should follow shortly after review of this report by school officials.
- * In the event the school decides affirmatively, CAUR will assist the school system in development and submittal to data processing vendors of a Request for Proposal (RFP) for a system to meet the requirements identified in this study.
- * Proposals received by the school district will be

evaluated, and two or three finalists will be selected from among all of the proposals for additional consideration.

- * School officials will be asked to approve the selection of finalists and to authorize further evaluation of these proposals, including visits to organizations with systems installed by the finalists.
- * CAUR will conduct a detailed evaluation of the remaining proposals and will recommend a system vendor for consideration by the school district.
- * Negotiation of a contract with the selected vendor will follow.
- * Finally, system installation, testing, and acceptance will complete the procurement plan.

The step-by-step plan outlined here is recommended for use by the Ashland-Greenwood Public Schools as a method proven effective for computer system acquisition by numerous organizations throughout the country.

IV. Current Data Processing in the Ashland-Greenwood Public Schools

The current level of data processing in an organization, whether manual or automated, is an indicator of that organization's need for improved technology. It also provides insight into potential problems that may arise with implementation of newer technology. Finally, review of an

organization's data processing operation 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 is a brief discussion of the administrative data processing activities of the Ashland-Greenwood Public Schools. Use of computers for teaching and automated instruction is not considered here. Data for this section of the report were provided by the administrative staff of the Ashland-Greenwood Schools.

The main administrative office of the Ashland-Greenwood Public Schools is located at the Ashland Elementary Building in Ashland, Nebraska. The school system currently accomplishes its data processing and financial management functions manually and through use of computerized reporting provided by Educational Service Unit No. 10 located in Kearney, Nebraska. The service currently costs the school system approximately \$2,000 per year, and costs are increasing at a rate of approximately 10 percent per year. The time lag associated with service bureau reports can be a little as three days, but the typical turnaround is one month for reports, resulting in a 30 to 60 day lag in accounting balances.

The following functions are automated through use of the service bureau.

- payroll--125 monthly payroll checks (including adjunct personnel)

- budgetary accounting--one general fund
- accounts payable--100 checks per month
- vendor ledger
- general fund accounting.

Currently, a number of administrative functions are performed manually. These include:

- personnel record-keeping--payroll, retirement, "verification of service," insurance and evaluation records
- student records--769 current records and records of graduates over the previous five years, including attendance, grades and grade point averages, class rank, ACT scores, and immunization records
- bus route and bus maintenance scheduling
- investment management
- library inventory, with 10,000 volumes at two locations
- school census--1,200 families in two counties, polled by telephone over a one-month period.

V. Basic Applications to Consider for Computerization

A. Introduction

The use of automated data processing in the Ashland-Greenwood Schools is relatively limited. This is understandable if for no other reasons than the district's current reliance on a batch-oriented service bureau, the time lag associated with this processing, and the costs and limitations regarding expansion or enhancement of current data processing through the service bureau.

The current generation of microcomputer technology provides great potential at relatively low cost to the

Ashland-Greenwood Schools for improved automation of a variety of administrative functions. A microcomputer system for the Ashland-Greenwood Schools should be:

Transaction oriented--When a transaction such as updating the accounts receivable file is made, the system accepts the transaction and automatically updates all affected ledgers and funds. This would, for example, permit automatic distribution of the entry throughout the system and would also provide for an audit trail of the transactions.

On-line--The computer video monitor, printer, and disk storage unit would be physically connected to the computer central processing unit.

Real-time--Processing on the system occurs at the time a user begins to work at a terminal, and no need exists to create punch cards or other input type documents to run through the system at a later time.

The system should also have the capability of allowing users to undertake unique inquiries and generate unique reports using English-like commands.

B. Application

With these system requirements in mind, the following functional areas should be considered for automation on a microcomputer by the Ashland-Greenwood Public Schools.

- * An integrated financial management system, including the following elements:

- general ledger accounting
- budgetary accounting
- vendor accounting
- accounts payable
- accounts receivable

* Payroll and personnel records.

Additional future functions that might be added to the system include:

- * Student records
- * School census.

VI. Equipment Configuration and Estimated Cost for Micro-computer System

A microcomputer system with one work station could fulfill the basic administrative data processing needs of the Ashland-Greenwood Schools. The system would require 64k of processing memory and a dual floppy disc drive. A single work station with video display and a dot matrix printer would be adequate for the current functional needs of the school system. The single work station would be located in the central administrative office.

The costs for the basic single work station system would range between the two amounts itemized below.

Hardware (CPU, video display, dual disk drive dot matrix printer)	\$ 3,500	to \$7,000
Software (Integrated financial management and payroll/ personnel system)	\$ 3,000	to 6,000
	<hr/>	<hr/>
Total	\$ 6,500	to \$13,000

VII. Alternative Methods of Acquiring Computer Technology

A. Alternatives

The Ashland-Greenwood Schools can acquire the required computer technology by three basic alternative methods. These alternatives are:

1. Rely on outside service bureaus for data processing. These agencies can be used to provide either "batch" or "on-line" data processing services.
2. Acquire in-house computer hardware and also develop application software (programming) for the system.
3. Acquire a fully programmed and supported system, including both in-house computer hardware and packaged application software. Such a system would be operated by existing school district personnel.

B. Evaluation of Alternatives

1. Service bureaus

a. Advantages

- Software and hardware are maintained by the service bureau.
- A highly qualified staff is often available in certain functional areas.
- The transition to automation from current operations would be relatively easy.

b. Disadvantages

- Limits are imposed by cost and expertise available at a service bureau regarding initiation of more sophisticated data processing capabilities.

- Communication costs can be high, especially if an on-line service bureau is selected.
- Scheduling and turn-around time difficulties may occur.
- Compared to a microcomputer system, use of an on-line service bureau may involve excessive costs.

2. In-house hardware/in-house software development

This alternative is not deemed acceptable for the following reasons:

- The length of time required to create the required software will be excessive.
- The personnel and cost requirements of in-house software development and support are excessive.
- The limited availability of qualified programmer/analysts with experience in school system administration would result in difficulty in hiring and retaining a qualified programmer(s).

This alternative would take too long, cost too much, and involve too much risk for a small public school system to implement a data processing system.

3. Microcomputer and Packaged Software

a. Advantages

- The school system would own and control its own system.
- The software is tested and reliable, and some packages can be modified by the vendor to meet the school system's specific requirements.

- The system can be operated easily by existing personnel.
- The system provides a relatively easy transition and introduction to electronic data processing.
- A procurement contract may possibly be executed so a vendor is fully responsible for system (hardware and software) performance according to the school district's specifications.

b. Disadvantages

- Certain problems are associated with ownership and control of a computer system, including system depreciation and obsolescence, equipment failure, and use scheduling.
- Unanticipated vendor problems can occur.
- Personnel problems involving both training of personnel and personnel fear of and/or opposition to a system.

C. Recommendation

This study recommends that a Request for Proposal (RFP) be developed to solicit proposals for microcomputer hardware and packaged software per the configuration recommended in Section VI of this report. The school district should not consider in-house software development or use of service bureaus because the costs involved in both alternatives are felt to be excessive, compared to the microcomputer alternative.