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# Electronic Data Processing in Washington's Schools: A Status Study

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ELECTRONIC DATA PROCESSING IN WASHINGTON'S  
SCHOOLS: A STATUS STUDY



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A Thesis  
Presented to  
The Graduate Faculty  
Central Washington State College

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

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by  
Lester Ray Jones  
August 1968

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COLLECTION



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APPROVED FOR THE GRADUATE FACULTY

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## CHAPTER I

### INTRODUCTION AND DEFINITION OF TERMS USED

In education, as in business, the daily operation of the schools requires mass handling of information, data, and records. To improve the speed of handling of those data, more and more school systems are utilizing electronic data processing (EDP). Compared to business, education has been slow in adopting the use of electronic equipment to aid in the recording and dispersal of the vast amounts of necessary data. The exact reason for this lag is not clear. Factors retarding the acceptance of EDP by those in education may be (1) lack of complete understanding of machine application to education; (2) economic, for school budgets at this time are commonly strained; and (3) fear by people in education that they may lose their position to a machine. (3:28-29)

Despite the effect of the forces at work retarding the acceptance of EDP in education, factors are also at work promoting the acceptance of the electronic equipment. Among these positive forces are (1) pressure by the public for greater efficiency on the part of the schools; and (2) the expanding enrollments in the schools which bring more records and papers without bringing more help for their processing. (3:3)

The acceptance of machine help in the larger districts has been necessitated by the increasing amounts of necessary paper work. For jobs such as payroll, student records, and other repetitious work, some districts have found EDP helpful and successful. With their success,

other districts are becoming more receptive of EDP and are investigating all angles of the systems. More and more school districts are now adopting EDP systems and in turn even more interest is being generated. (3:27-28)

## I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to learn what jobs the largest school districts in Washington were doing on EDP; (2) to learn what equipment was being used in doing those jobs; (3) to learn what EDP was costing the districts who were using it; and (4) to answer other questions which might be of interest to school districts considering the utilization of EDP.

Importance of the study. This study is important for the following reasons:

1. Schools are recording more information concerning all aspects of their operation than ever before. This job is becoming more time consuming and expensive. This study could show educators that EDP may be a means of accomplishing those jobs more efficiently.

2. This study could be of value in helping school district officials decide if EDP would work for them at a cost affordable by the district.

Limits and scope. Limitations of this study are that (1) the study was limited to a survey of only eleven school districts in the entire state; (2) available money, jobs performed, overall cost, equip-

ment used, and manpower required for the operation could be constantly changing; and (3) the continued validity of the study is doubtful because of rapid changes which are occurring in the field of data processing.

## II. DEFINITIONS OF TERMS USED

Because EDP is a relatively new area, some terms may need to be defined so that all readers understand what is written.

Data. "Data can include any facts, figures, letters, words, charts, or symbols that represent an idea, object, condition, or situation." (1:1)

Data processing. "Data processing refers to the recording and handling that are necessary to convert data into a more refined or useful form." (1:1)

Electronic data processing (EDP). For purposes of this study, the term EDP involves the computer and/or the electromechanical equipment used in conjunction with the handling of data.

Hardware. Hardware is a term applied to "the mechanical, electrical, and electronic features of a data processing system." (1:312)

Unit record equipment. Unit record equipment shall mean hardware other than the computer which is used in the preparation and handling of punched cards.

Card punch. A card punch is a machine used for punching holes into cards to represent original data in the form of a special code.

Verifier. A verifier is a device for verifying the accuracy of the card punch operation.

Interpreter. An interpreter prints on cards the same information which is punched on them. (1:9)

Sorter. A sorter "arranges punched cards in alphabetical and/or numerical sequence, or groups cards according to any classification punched in them" (1:9)

Collator. A collator "merges two sets of cards in similar sequence into a single set, or matches two comparable sets of cards to see if they are in agreement." (1:9)

Reproducer. A reproducer punches cards from a master card so the operator can have several cards containing the same data. (4:22)

Calculator. A calculator performs calculations from punched cards and punches the results. (1:9)

Accounting machine (tabulator). This "reads, summarizes, and prints information from data recorded in punched cards." (1:9)

### III. SUMMARY

Processing all data expected in the operation of a school district is becoming more of a problem that school officials must face each year. Swift, efficient results are desirable. This study was designed to show what jobs are being done by EDP, the equipment being utilized in performing these jobs, the annual cost to each school district, and answers to other questions which might be of interest to those districts planning to utilize EDP as a solution to their own problems.

## CHAPTER II

### REVIEW OF THE LITERATURE

There have been only two other studies made in this state that are directly related to this thesis. Because of the limited research in this area, a summary of both studies will be presented here.

#### I. THE FIRST STUDY

The first study was conducted for the School Information and Research Service (SIRS) during late 1965. (2:1-4)

Purposes. The purposes of that study were threefold:

- (1) to determine the extent to which data processing was being used by the schools of the state;
- (2) to determine the various school functions for which data processing is used;
- (3) to determine the extent to which school systems are finding it most feasible to:
  - (a) purchase data processing equipment,
  - (b) lease the equipment,
  - (c) use the equipment cooperatively with other schools as in (3a) or (3b) above, or
  - (d) take the data to commercial service centers for processing.

Results. The study was conducted by questionnaires sent to 185 school districts of which 136 were returned for a returned total of seventy-four per cent. Of the schools answering, the following information was found:

a. Using electronic data processing	19
b. Planning to utilize data processing	30
c. Equipment owned by district	6
d. Equipment leased	17
e. Districts data processed in a commercial service center	13
f. Equipment is used by a single district	12
g. Equipment is used cooperatively with other districts	5
h. Data processing is used for	
1. student scheduling	16
2. grade reporting	19
3. test scoring	13
4. personnel accounting	9
5. research	10
6. payroll	15
7. budgetary accounting and control	14
8. inventory	7
9. instructional purposes	12
10. other	No available figure

This first study ended with a few comments from the districts. No conclusions were published with the report of the results of the study.

## II. THE SECOND STUDY

The second study was a follow-up of the first. (6:1-8) It, too, was conducted by questionnaire, and it was conducted during January of 1967. This time the questionnaires were sent only to those districts who had earlier reported using or planning to use electronic data processing. Forty-nine school districts were sent questionnaires and thirty returned them for a total return of sixty-one per cent. This study called for more detailed information, a summary of which is presented.

Purposes. Purposes of the second study are listed below:

(1) to determine the progress which school districts in Washington have made in the use of data processing since the earlier survey in 1965;

(2) to determine procedures which have been or will be followed in instituting data processing with regard to:

- (a) planning
- (b) staffing
- (c) equipping
- (d) evaluating

(3) to compare the actual procedures of those districts already involved in data processing with the stated intentions of the districts which plan to utilize EDP.

Results. Results of the survey were published in five sections: Current and intended use of EDP, Planning, Staffing, Equipment, and Evaluation. A summary of each section follows.

Current and intended use of EDP. As in the first study, grade reporting, student scheduling, and payroll were the most widely used services. Most districts adding services added budget and inventory most frequently. Districts planning to utilize EDP most frequently plan first in the areas of payroll and budget followed by student scheduling, grade reporting, and test scoring.

Planning. This part of the questionnaire attempted to (1) identify the innovator who provided motivation for EDP, (2) determine the type of pre-study planned or conducted, (3) identify the groups

participating in the pre-study, and (4) identify the techniques used for "selling" the plan to the school board.

Under Part 1 the superintendent was identified as the innovator approximately twice as often as either the assistant superintendent, business manager, or the principals.

In Part 2, sixty-five per cent indicated a comparative study of the type and cost of services rendered had been conducted prior to implementation of the service. Of the districts planning to use EDP, ninety-two per cent indicated the intention for such a study.

Part 3 indicated that of the groups participating in the pre-studies, the major role was assumed by central office personnel, although some districts included building administrators and clerical personnel. Only one reporting district stated the intention of involving teachers.

Part 4 stated that all districts did or will submit a formal statement outlining the plan for EDP to the school board prior to implementation of EDP.

Staffing. This study showed that most school districts (sixty-five per cent) put one person in charge of the data processing activities for the district. Some authorities recommended that this director should be an educator who had received special training in educational data processing, computer science, and computer language. A common recommendation is that he hold a master's degree in administration.

Equipping. Three basic methods of obtaining data processing exist. Services of a commercial data service center may be used, a

district may lease or rent equipment, or a district may purchase equipment. Combinations of these alternatives are available.

Eighty-eight per cent of those districts dealing with a commercial service center have no intention of changing. All districts renting or leasing plan to continue. Of the group which own their equipment, sixty per cent are not convinced that owning equipment is the best method of securing data processing services for their district.

Districts who have initiated the use of EDP since the first study total six. None of these six own their equipment and of those planning to use EDP in the near future, none intend to lease or purchase equipment.

Evaluation. Sixty-six per cent of the districts stated that they do not provide for a periodic formal evaluation of the system they are using. All districts planning for EDP indicate a formal evaluation procedure will be instituted.

Ninety per cent of the districts using EDP report that they are attaining the original objectives from their systems.

Conclusion. The basic conclusion of the second study was that EDP was in the schools to stay. Expansion of school enrollment and an increasing shortage of qualified staff assure this, according to the study. However, the rate of expansion of EDP into the schools remains slow.

## CHAPTER III

### PROCEDURES

The idea for this study came from personal curiosity about data processing in the schools and as a result of a workshop designed for educators in data processing.

The study was designed to gather information from school districts in Washington. As the personal interview was being used, it was deemed necessary to limit the number of districts. As cost is a major factor in the adoption of EDP, and because larger districts generally have larger budgets, it was decided to limit the study to the larger districts.

The eleven largest districts in the state were selected for visitation. Although other smaller districts were known to be using EDP, it was not considered practical to visit all of them.

#### I. THE INTERVIEW GUIDE

It was decided that a set of pre-determined questions would be beneficial in guiding the interviews. Questions which were considered pertinent to the purpose of the study were determined and used. Questions making up the interview guide can be found in Appendix A, page 32.

#### II. THE INTERVIEWS

The interviews were begun during August of 1967. As the beginning of the school year is a busy season for data processing, the data processing directors were found on the jobs except in one case. In this

case, the assistant to the director was interviewed. Appointments were arranged in advance by telephone. In most cases the directors were eager to supply information. They appeared interested in their work and in this study.

### III. INTERVIEW PROCEDURE

The interviews ranged in length from twenty minutes to almost one hour. Average length was approximately thirty-five minutes. Answers to questions on the interview guide were recorded as given. If, during the discussion, all questions were not answered, unanswered parts of the interview guide were presented one by one until all parts were answered. This procedure seemed to work well and allowed an informal atmosphere to prevail in most instances. Interview results were typed into more formal style immediately following each interview.

### IV. SUMMARY

Eleven Washington state school districts participated in this study. Appointments were arranged in advance by telephone. A set of pre-determined questions was used during each interview so that uniform information could be obtained.

## CHAPTER IV

### RESULTS OF THE SURVEY

Results of the survey were compiled on the basis of answers obtained during the interviews with the director or assistant director of each EDP center. Results not shown in tables are discussed in the order in which they appeared on the interview guide.

#### I. DISTRICT SIZES

Table I contains data relating to the sizes of school districts studied. The eleven districts ranged in size from the more than 90,000 pupils of the Seattle School District to the 13,223 pupils enrolled in the Everett system. The enrollment figures were given by the EDP director in each case.

Size was also shown in terms of schools within each participating district. Seattle ranked first with 115 schools. Everett had the fewest schools with a total of 19. These figures include elementary, junior high, and senior high schools plus "special" schools.

District size in terms of the number of students for whom EDP was used showed an even wider range. In Seattle, EDP was used for all of the more than 90,000 students, while in Everett, EDP was utilized in connection with only 1,600 of the 13,223 enrolled in the district. Seven of the eleven districts were utilizing EDP for all of their students, and four districts were not.

TABLE I

## DATA RELATING TO SIZES OF PARTICIPATING DISTRICTS

District	*Pupils enrolled as given by EDP supervisor	Schools in district	*Pupils for whom EDP was used	*Teachers
Seattle	90,000+	115	90,000+	4200
Tacoma	36,000	60	36,000	1670
Spokane	34,000	61	14,000	1600
Highline	30,000	47	30,000	1350
Edmonds	26,000	40	26,000	1100
Bellevue	23,000	33	23,000	1100
Shoreline	17,276	24	17,276	750
Vancouver	15,500	23	7,000	700
Renton	15-16,000	22	7,000	700+
Clover Park	14,100	24	14,100	700+
Everett	13,223	19	1,600	640

\* Where column headings are marked by an asterisk (\*) numbers, in most cases, are assumed to be approximate.

The last area of comparison of district size was in size of the teaching staff. Again, Seattle ranked first with about 4,200 teachers, and Everett ranked eleventh with 640.

Not all figures on this table were exact, but they were adequate for purposes of comparison.

## II. EDP STAFFS AND BUDGETS

Table II contains data about staff sizes and monies budgeted for the operation of the EDP center in each district. In terms of staff, Seattle was the most involved with a staff of forty-five full time and two part time employees. The next largest operation in terms of staff was Tacoma with twelve full time employees. Neither Everett nor Vancouver had any staff members whose primary duty was EDP. Their work was done by the nearby college in each case.

Table II was also designed to contain information about the size of each district's EDP operation in terms of an annual budget figure. A wide range of responses resulted from the question, "What is the district's annual budget for EDP?" Seattle, with almost fifty employees and a relatively recent computer operation had "No set budget." Spokane's EDP center operated as part of the business office budget for the district and the supervisor could not give an accurate figure.

TABLE II

## EDP STAFFS AND BUDGETS IN EACH PARTICIPATING DISTRICT

District	Full Time EDP Employees	Part Time EDP Employees	Annual EDP Budget
Seattle	45	2	No set budget
Tacoma	12	0	\$200,000
Spokane	11	0	Unknown (Part of business budget)
Highline	5	2	\$75,000 (Est.)
Edmonds	5	0	\$100,000 (Approx.)
Bellevue	10	2	\$180,000
Shoreline	10	0	\$217,000
Vancouver	0	0	\$28,000
Renton	2	1	\$10-12,000
Clover Park	10	1	\$120,000
Everett	0	0	Not yet determined

## III. PER PUPIL COST FOR EDP

Table III is a listing of the calculated per pupil costs in the districts which revealed their annual EDP budgets. A very noticeable range in those costs was apparent. Renton's per pupil cost, which was based on vague figures, was low at \$ .75. Shoreline was paying most per pupil with a \$12.61 figure. All other districts showed a wide range in the per pupil cost but fell between those given. Annual budgets were not given by three districts so their per pupil rates were indeterminable. These figures are assumed to include student-oriented and business-oriented applications.

TABLE III  
PER PUPIL COST FOR EDP

Seattle	Indeterminable
Tacoma	\$5.55
Spokane	Indeterminable
Highline	\$2.50
Edmonds	\$3.85
Bellevue	\$7.82
Shoreline	\$12.61
Vancouver	\$1.85
Renton	\$ .75
Clover Park	\$8.51
Everett	Indeterminable

Everett's budget had not yet been determined. Two budgets were near \$200,000 annually with Shoreline quoting \$217,986 and Tacoma quoting \$200,000. The smallest figure given was from Renton who reported \$10,000-12,000, yet they had two full time and one part time employees.

#### IV. EDP HARDWARE

Table IV identified the EDP hardware in use by each of the surveyed districts. Seven of the districts had their own computer installations. Two of those seven had two computers each. Four of the districts did not have their own computer installations, but indicated that they hired computer time. Renton and Tacoma did not have computers at the time of the survey, and both Vancouver and Everett had their work done by local colleges.

Unit record equipment had been acquired by all but one of the districts. This equipment is necessary for the preparation of data for the computer. Extra equipment can be obtained for the handling of that prepared data so some districts had more equipment than others. All districts, except one, had the two basic pieces of equipment necessary for placing the data, or computer input, on cards. These two pieces are the keypunch and verifier. A district may have more than one of those pieces of equipment which are listed under "Unit Record Equipment." This would be necessary in any "sizable" operation. Seattle had the most different types of equipment and Vancouver had none. Seattle, Highline, Edmonds, and Shoreline had equipment which fell outside the realm of "Unit Record Equipment" and was listed under "Related Equipment."

TABLE IV

## EDP HARDWARE IN USE BY PARTICIPATING DISTRICTS

District	Computer system used	Unit Record Equipment										Related Equipment			
		Keypunch	Verifier	Sorter	Interpreter	Reproducer	Collator	Accounting Machine	Burster	De-collator	Calculator	Optical Scanner	Test scoring and/or card punch equip.	Tape to card converter	
Seattle	IMB 360	x	x	x	x	x	x	x	x	x			x		
Tacoma		x	x	x	x	x	x	x			x				
Spokane	IBM 1440 IBM 1401	x	x	x	x	x	x								
Highline	Univac 1004	x	x	x	x	x	x					x		x	
Edmonds	IBM 1401	x	x	x						x			x		
Bellevue	Honeywell H-200	x	x	x	x	x	x		x	x					
Shoreline	IBM 360	x	x	x	x	x	x					x			
Vancouver*															
Renton		x	x	x	x	x									
Clover Park	IBM 1620 Honeywell H-200	x	x	x	x	x	x	x							
Everett*		x	x												

\*These two districts use the equipment of the junior colleges near them. Everett has its own equipment as indicated.

These pieces of equipment, though useful, are not necessary to the handling of data for the computer system.

#### V. FIRST EDP APPLICATIONS IN PARTICIPATING DISTRICTS

Table V is a listing of the first applications of EDP in each district. Those first applications have been placed under eight different job titles. Payroll was the single most frequently named application. Seven districts started with the handling of their payrolls as an initial EDP application. Grade reporting was the next more frequently named application, being an initial application in four districts. Eight districts first utilized EDP for two different jobs at about the same time. Five of the eleven districts chose initial applications not chosen by any other district. Of the eight initial applications, only three were first jobs in more than one district.

#### VI. CURRENT STUDENT-ORIENTED EDP APPLICATIONS

Table VI contains the listing of current applications of EDP to jobs relating directly to the students of the districts. It also shows the number of districts using EDP for those particular jobs. The most frequently named application directly relating to the student was secondary scheduling. Nine of the eleven districts were using EDP in that capacity. Scheduling was followed in frequency of usage by grade reporting, test scoring, and student records. One district reported that "everything" was currently done by EDP.

TABLE V

## FIRST EDP APPLICATIONS IN PARTICIPATING DISTRICTS

School District	APPLICATIONS							
	Grade Reporting	Inventory	Payroll	Registration	Scheduling	Statistical Studies	Fiscal Accounting	Information
Seattle						X		
Tacoma	X		X					
Spokane		X	X					
Highline			X				X	
Edmonds			X					
Bellevue	X		X					
Shoreline			X					X
Vancouver	X				X			
Renton				X	X			
Clover Park	X				X			
Everett			X					

TABLE VI  
 IDENTIFICATION OF CURRENT STUDENT-ORIENTED EDP  
 APPLICATIONS IN PARTICIPATING DISTRICTS

APPLICATIONS	NUMBER OF DISTRICTS
A.S.B. Accounting	1
Attendance	2
Class Lists	2
Grade Analysis	1
Grade Reporting	7
Test Scoring	6
Registration	2
Scheduling (Secondary)	9
Student Records	5
Utilization of Test Data	1

Note: One district reported "Everything" is done on EDP equipment.

## VII. CURRENT BUSINESS-ORIENTED EDP APPLICATIONS

Table VII identifies EDP applications for business-oriented tasks and the number of districts utilizing EDP for each of those operations. Applications have been arbitrarily assigned titles which, in some cases, cover a wide job range in order to prevent repetition. The category covering accounting operations was reported most often with eight of the eleven districts reporting the application. That category included a variety of accounting operations but not necessarily all accounting operations for the district.

The second most frequently mentioned application was payroll which was mentioned by six districts. Although not defined, research was reported by two districts. This could include some student-oriented research, but it was arbitrarily included in Table VII because it could also be business-oriented research. The Clover Park School District was the only one reporting the use of its equipment for neighboring districts. This could have been student-oriented or business-oriented work but was also included in Table VII.

## VIII. PROJECTED EDP APPLICATIONS

Table VIII is a listing of the areas in which districts plan to move in the application of EDP. Although several of these projections were expansions of current applications, others may be entirely new. Seven districts planned to apply EDP to other areas of business accounting within the district. Six districts planned to expand into areas of

TABLE VII  
 IDENTIFICATION OF CURRENT BUSINESS-ORIENTED EDP  
 APPLICATIONS IN PARTICIPATING DISTRICTS

APPLICATIONS	NUMBER OF DISTRICTS
*Accounting Operations, various	8
Budget Reports	3
Bus Records	2
Inventories	3
Payroll	6
Personnel Records	3
Research	2
State Reports	2
Work for Neighboring Districts	1

\*One district (Seattle) reported "business type jobs" were being done but did not elaborate on what those jobs were so that must be considered when reading the table.

TABLE VIII

## PROJECTED EDP APPLICATIONS IN PARTICIPATING DISTRICTS

APPLICATIONS	NUMBER OF DISTRICTS
Accounting--Expansion to cover more aspects of business accounting	7
Accounting--Expansion to cover more aspects of pupil accounting	6
Computer Assisted Instruction	3
Installation of remote terminals for acquisition of data from the schools	1
Inventorying	5
Personnel Records--Expansion of	2
Records for Colleges	1
Research	2
Scheduling--Expansion of services	2
Testing--Expansion of services	3

pupil accounting while five districts planned to use EDP for various types of inventorying. Computer assisted instruction was planned in three districts. One district planned to install remote terminals throughout the district so that the EDP center could more readily acquire data with which to work. A variety of other applications were also planned for the near future.

#### IX. DATA NOT SHOWN IN TABLES

Item seven on the interview guide, "When was EDP first utilized?" elicited the following information. Although EDP had been used in the Seattle district since the 1930's when it was first used for statistical studies, the first card punch equipment was not obtained until the 1958-1959 school year. A computer was not delivered until late in 1966 although it had been ordered some time in 1964. Other districts' responses indicated use of EDP from 1958, as in Tacoma, through the time of the survey when Vancouver still had none of their own equipment.

To question eight, "Do you use a data service or your own equipment?" the responses indicated that none of the eleven districts used a commercial data center. Two districts used equipment from nearby colleges, but they are not considered by the districts to be commercial data processing centers. The other nine districts have their own equipment except for the computer, on which time may be rented at many installations.

From the question, "Do you rent, lease, or own the EDP equipment you use?" it was learned that five districts own at least part of their

equipment, eight districts lease some or all of their equipment, and three districts rent some or all of their equipment. Four districts have equipment by a combination of these arrangements.

"What is the status of the person in charge of data processing in the district?" brought forth a variety of answers. In six districts there was a data processing supervisor who was in charge of the data center and who was responsible to the superintendent or to an assistant superintendent. Others in charge of centers were one administrative assistant, one business manager, one director of guidance and research, and a dual team comprised of an assistant superintendent and a business manager.

Answers to question eighteen, "In your opinion, how large need a district be to make EDP feasible?" varied widely. At the upper extreme, estimates of 20,000 student enrollment were given by two EDP supervisors with one of those saying possibly at 10,000. Three other replies gave 10,000 as a safe size. Three replies estimated that any first class district could justify an EDP center. Other answers were a payroll of 200-300, an enrollment of 6,000, and one replied that there was no best size.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### SUMMARY

The daily operation of the schools today requires mass handling of an increasing amount of data. Some school districts have already turned to EDP to help them process these masses of information. This study was designed to obtain answers to questions which might be of interest to districts considering the utilization of EDP in the operation of their school system.

#### CONCLUSIONS

The largest school districts in Washington are applying EDP to tasks that have been identified in nineteen different categories. Those categories are divided into student-oriented tasks and business-oriented tasks. The most frequent areas of application in the student-oriented tasks are secondary scheduling, grade reporting, test scoring, and student records in that order. Other applications are attendance, class lists, registration, A.S.B. accounting, grade analysis, and utilization of test data. Business applications include accounting, payroll, personnel records, inventories, and budget reports in that order. Other applications are bus records, research, state reports, and work for neighboring districts.

Seven of the eleven largest districts had their own computer systems which were supplied by three different manufacturers. They were IMB, Honeywell, and Univac. All of those seven districts had the related equipment which was necessary for the EDP operation. The four other districts had some of their own equipment, but depended on other centers for computers. One district had no equipment of its own.

Eight districts revealed annual budget costs ranging from \$217,000 to \$10-12,000. Per pupil expenditures were figured to range from \$ .75 to \$12.61 per pupil.

EDP supervisors seemed reluctant to reveal annual budget figures. Two of the largest operations did not reveal their budgets.

Special facilities must be provided for an EDP center and the staff required to run it.

EDP supervisors generally indicated that EDP may cost more than hand processing, but speed of service and an increase in total services can be provided.

Interviewees did not agree on the size a district must be to make an EDP center practical. Estimates ranged from 20,000 pupils to "any first class district."

Most of the districts have been using EDP for several years. They have obtained their equipment by a combination of ownership and rental plans in most instances.

Payroll, grade reporting, and scheduling were most commonly the first jobs done by EDP centers. Eight of the eleven surveyed districts

had begun operation doing two different jobs.

Most districts had one person who was responsible for the management of the EDP operation.

Most of the largest districts are so committed to EDP in terms of facilities and money that it is unlikely they will switch data processing procedures in the near future.

#### RECOMMENDATIONS

As a result of the study, it is recommended that a thorough study be undertaken by any district in the state that might be considering the possibility of establishing an EDP center. The remaining districts, all of which are smaller than the eleven included in this study, must operate on generally smaller budgets. In depth studies may reveal other less expensive solutions to the problem of handling the mounting data. For instance, it has not been established that each district needs its own EDP center.

It is recommended that care be taken in establishing an EDP budget and staying within the limits of that budget once it is set. The wide range in per pupil costs among districts is an indicator that costs can mount rapidly. It is also recommended that districts in this study keep track of per pupil costs and compare their costs with districts that have a comparable operation.

It is recommended that extreme caution be exercised in determining the suitability of EDP as the answer to a district's data processing problems. Representatives of districts considering EDP

should talk to people involved with EDP. They should talk to people affected by the services of the EDP center. They should be sure that EDP is the best answer at a price the district can afford.

## BIBLIOGRAPHY

## BIBLIOGRAPHY

1. Arnold, Robert R., Harold C. Hill, and Aylmer V. Nichols. Introduction to Data Processing. New York: John Wiley and Sons, Inc., 1966.
2. "Data Processing," Slants, VII (February 18, 1966), pp. 1-4.
3. Goodlad, John I., John F. O'Toole, Jr., and Louise L. Tyler. Computers and Information Systems in Education. New York: Harcourt, Brace and World, 1966.
4. Grossman, Alvin and Robert L. Howe. Data Processing for Educators. Chicago: Educational Methods, Inc., 1965.
5. Washington Education Association, Washington Educational Directory 1965-1966. Seattle--In cooperation with Washington Interscholastic Activities Association.
6. Whitehead, Robert E. "The Status of Data Processing in Washington Schools," Slants, VIII (March 20, 1967), pp. 1-8.

## APPENDICES

## APPENDIX A

## BASIC ITEMS ON QUESTIONNAIRE:

1. District name:
2. District enrollment:
3. Number of schools:
4. Number of teachers in the district:
5. Does the district utilize EDP?
6. Number of students for whom EDP is used:
7. When was EDP first utilized?
8. Does the district use a data service or its own equipment?
9. Does the district own, rent, or lease the equipment?
10. What EDP equipment does the district have?
11. What were the first jobs done for the district on EDP equipment?
12. What jobs are currently done by EDP?
13. What additional jobs are planned for EDP?
14. What is the status of the person in charge of EDP in the district?
15. How many EDP employees does the district keep?
  - a. full time?
  - b. part time?
16. What is the district's annual budget for EDP?
17. What is the annual per pupil cost for EDP?
18. In your opinion, how large need a district be to make EDP feasible (Number of students)?

## APPENDIX B

IDENTIFICATION OF SCHOOL DISTRICTS WHO PARTICIPATED  
IN THIS STUDY BY STUDENT ENROLLMENT AS OF  
SEPTEMBER 21, 1965. (5:26-94)

Seattle School District	99,340
Tacoma School District	34,896
Spokane School District	33,882
Highline School District	26,348
Edmonds School District	22,185
Bellevue School District	19,074
Shoreline School District	16,001
Vancouver School District	13,886
Clover Park School District	13,871
Renton School District	12,925
Everett School District	12,495