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EDUCATIONAL ADMINISTRATION AND EDUCATIONAL DATA PROCESSING

THE FIRST DECADE

A DESCRIPTIVE STUDY OF SELECTED MICHIGAN SCHOOLS

by
George Babich, Sr.

A dissertation submitted in partial fulfillment
of the requirements for the degree of
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Doctoral Committee:

Professor James L. Lewis, Chairman
Associate Professor Frederick Bertolet
Professor M. Clemens Johnson
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ABSTRACT

EDUCATIONAL ADMINISTRATION AND EDUCATIONAL DATA PROCESSING

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by George Babich, Sr.

Chairman: James L. Lewis

Statement of the Problem

This study is concerned with the relationship of Electronic Data Processing (EDP) to Educational Administration in selected Michigan schools during the first decade of its introduction and implementation as a means of coping with increasing demands upon educational institutions. The introduction and rapid rise of this technology was not preceded by adequate knowledge or training for hurried implementation by educational administrators.

Purpose of the Study

Educational Data Processing and its relationship to educational administration is a relatively recent phenomenon.

The basic purpose of this study is to describe how this relationship has fared and to determine whether the educational administrator can advantageously use EDP services without possessing the skills of a technician.

Research Design

The sample data base reflected in this descriptive study was obtained from personal interviews with administrators and EDP directors from ten selected Michigan school districts.

The ten districts were selected by two educators familiar with the growth of EDP within the State of Michigan.

The criteria for the selection of the sample districts was:

1. The districts must have been involved in more than one application area of EDP.
2. The EDP activity has involved administrators at the level(s) of superintendent, assistant superintendent and EDP director.

Data Collection

The method used to establish a data base for the study was the personal interview using a questionaire. The questionaires were identical and pre-coded to reflect responses

appropriate to the administrative level. The questionaire reflects the 1) historical, 2) experience, 3) education, 4) recommendations and 5) implementation aspects of EDP growth and development within the selected Michigan school districts.

Conclusions

Within the context of the study, four questions were investigated.

1. What is the role of the school administrator based upon his experience with electronic data processing during this transitional period?

Conclusion:

The educational administrator's role in the transition from manual to automated systems has been to exert leadership influence to initiate and provide the direction for the appropriate use of EDP within his organizational structure. In most instances, the transaction has been accomplished without a full realization of the problems and subsequent effect upon the existing organization. This condition in great measure exists today.

2. Who determines the nature, priorities and use of information produced by electronic data processing?

Conclusion:

Initially, the direction and use of EDP was determined by the superintendent and EDP director. This condition still persists. Presently, EDP activities have developed a broader base and acceptance within educational institutions. As a result, a committee approach is beginning to emerge in establishing priorities and utilization of EDP services.

3. What has been the evolving pattern of Educational Data Processing within the educational environment of Michigan schools?

Conclusion:

Within the State of Michigan, there has been a fragmentary approach to EDP activity in Michigan schools. The major contribution has come from local and intermediate school district sources. The State Department of Education has not accepted a coordinating role in this endeavor. The EDP coordinating function appears to be the emerging role of the Intermediate school districts.

4. Has Educational Data Processing become a management tool or a mechanical clerk by perpetuating older manual methods?

Conclusion:

The use of EDP is beginning to emerge as a management

tool. Presently, there is a lack of knowledge and understanding of a systems approach as an aid in assisting educators in meeting demands placed upon their organizations. Irrespective of present limitations, a basic understanding of EDP methods, limitations and potential is beginning to emerge. EDP is establishing itself as a management tool. Educational administrators have gone beyond using EDP as a mechanical clerk.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

Historically, public education's role in America has been viewed as an expression of democracy in action. In fulfilling this role, it has attempted to reflect the aspirations of its citizens and to perpetuate its institutions.

The historic acceptance of this role is the common thread that is found in the writings and practices reflecting American education; whether it be the Educational Policies Commission[1] expressing the thought that ". . . the American people have traditionally regarded education as the means of improving themselves and their society . . ." or Counts[2] stating that

> In its present form, our American educational system is the product of the American community, of the American people

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[1]Educational Policies Commission, "The Central Purpose of American Education", The National Education Association Journal, L (September, 1961), p. 13.

[2]George S. Counts, Education and American Civilization, (Bureau of Publications, Teacher's College, Columbia University, 1952), p. 433.

> in their social and historical relations. With all of its deficiencies and excellences, and it has many of both, it is an authentic expression of our democracy. Yet that it is the only such expression must be rejected, if we are not to accept the doctrine that all history is fated and men are but helpless pawns of destiny.

Today, education's traditional role, values and goals are being examined and questioned. The needs of society are demanding a re-allocation of human and material resources for which educational programming does not presently exist. That these needs exist can be illustrated by two demographic facts.

First, there has been a fundamental shift from reliance upon manual work to a greater reliance upon man's intellect. At the turn of the present century approximately seventy percent of the work force was devoted to production services and agriculture. Limited skill and judgment was required for these activities.

Second, the rate of change has accelerated to the degree that by the end of the century it is projected that less than twenty percent of the nation's work force will be involved in physical labor.

Projections now exist that approximately one-half of

the population will be under twenty-five years of age in the decade of the 1970's; while thirty percent of our nation's population (65 million people) will be concerned with education as students, teachers or workers.

Presently, increasing enrollments, physical plant expansion and increased operating costs has made education one of America's largest enterprises. It is estimated that one out of every four Americans is occupied in schools in one capacity or another. Further, the capital assets in school plants are estimated as being in excess of thirty billion dollars. This investment in public education is four times the assets of General Motors, America's largest corporation.

If current trends continue, projections by the United State Office of Education show the United States will spend seventy-six billion dollars a year in 1977 to educate sixty-three million public and non-public school students, a forty percent increase in spending and an increase in enrollment of ten percent.

The rise in expenditures are the result of increased enrollments at the most costly levels - high school and

college. The post secondary rise is projected to be fifty-four percent; high school will increase by twenty-two percent and enrollments in kindergarten through eighth grade is expected to decline by two and one-half percent.

It is within this environment that the educational administrator finds himself seeking those alternatives which will educate a generation of youth to meet their own hopes and aspirations and meet the needs of society.

To satisfy these diverse needs, the reliance upon knowledge and information in a manageable form has become a major consideration. Presently, a technology which permits the employment of a systematic technique to harness the growing accumulation of facts and knowledge needed by school administrators is emerging.

For the purposes of this study, this technological approach is called Educational Data Processing.

Statement of the Problem

Electronic Data Processing (EDP) in an educational environment has seen rapid growth and is on the increase throughout the nation.

Within the State of Michigan, the use of EDP methods by the educational administrator to assist in the solution of problems has existed for more than a decade.

There can be little quarrel that the educational administrator is still interested in answering the questions of what - why - who - when - where and how in meeting the increasing and changing demands upon educational institutions and programs. The prospect for meeting the fast changing needs in education by utilizing EDP methods requires that attention be given to the management requirements of EDP endeavors.

The purpose of this study is to describe the relationship of Electronic Data Processing (EDP) to educational administration. This study will investigate the introduction, implementation and utilization of EDP as it has and does exist in an educational environment.

Approximately a decade of EDP utilization in education has seen hundreds of public school districts affected by its demands and promises of greater rewards. The introduction and rapid rise of this technology was not preceded by adequate training or knowledge for the hurried implementation by educational administrators. As a result, the

expenditure of human resources, public monies, and time produced a marriage of necessity.

Because these conditions exist, this study is concerned with the relationship of Educational Data Processing (EDP) and educational administration and how it has fared.

Design of Study

The research and collection of data relative to the subject of this dissertation is categorized as "descriptive" as defined by Best[3].

> Descriptive research describes and interprets what is. It is concerned with conditions or relationships that exist; practices that prevail; beliefs, points of view; or attitudes that are held; processes that are going on, effects that are being felt; or trends that are developing.

The investigation of four questions comprise the basis for the research of this study.

1. What is the role of the school administrator based upon his experiences with electronic data processing in this transitional period?

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[3] John W. Best, Research in Education, (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1959), p. 102.

2. Who determines the nature, priorities and use of electronic data processed information?

3. What has been the evolving pattern of Educational Data Processing within the educational environment of Michigan schools?

4. Has Educational Data Processing become a management tool or a mechanical clerk by perpetuating older manual methods?

Procedures - Data Collection

The data necessary for this study involve the experiences of administrators within ten selected Michigan school districts. To minimize any personal bias relating to the selection of school districts, two educators familiar with the growth of EDP technology submitted individual lists of Michigan school districts having EDP experience which would meet the requirements of this study. The final basis of selection rested upon agreement between the two submitted lists. The criteria for selection of the school districts was:

1. The district must have been involved in more than one application area of EDP (i.e., administrative services, student services).

2. The EDP activity has involved administrators at the level(s) of Superintendent, Assistant Superintendent (or its equivalent), and EDP Director.

The size of the district was not a controlling factor in the selection process. However, the need for comprehensive information, based upon the sample of ten Michigan school districts, required a personal interview with administrators within each district.

The collection of the data was accomplished by designing a pre-coded questionaire which made it possible for EDP processing and tabulation. The design of the data-gathering questionaire strived for consistency in having complete response(s) to all items. Thus, it enables cross-checking of selected data. Further, it provided for a data base in the event key personnel in the district's EDP development were not available or had left the district. Two other elements of the design were:

1. The questionaire formats were of identical design and pre-coded to reflect responses appropriate to the administrative level.

2. The data items and procedures were designed to gain the maximum data thought necessary for the study.

The interview instruments are reproduced in the Appendices.

The data reflected in these instruments has four categories:

1. Historical-descriptive data of the school district (Appendix A)
2. EDP applications and utilization (Appendix B)
3. Interview responses (Appendix C)
4. Term recognition (Appendix D)

The table format for presentation of items in the questionaire are tabulated and represented as individual and composite descriptions of the areas related to the study of school districts involved in this study.

The selection of items in the first category related to the eleven Historical-Descriptive data of the ten school districts establish a point of reference consistent with the purposes of this study. It describes the physical and financial characteristics of the school districts. Its value to the study rests as a point of reference for purposes of establishing similarities and/or differences that exist among the school districts adopting automated systems.

The second category devotes itself to a historical and evolutionary development of EDP utilization culminating in the present practices (applications) of EDP in providing educational administrative services.

The extent of these services in great measure provides

an insight to the potential of EDP as an administrative tool. The results are tabulated to reveal EDP activity within each school district as well as a composite view of the ten districts involved in the study.

The fourteen categories relating to EDP utilization with one hundred possible EDP applications are a compilation of administrative services suggested by G. Ernest Anderson, Jr.[4] which reflect and adequately summarize the author's experiences with EDP.

The interview responses of school administrators relate to the introduction, implementation and growth of EDP in an educational environment. The responses represent their experiences and insights and are central to this study.

An analysis of the interview responses reveals that five categories comprise the basis of the interview questionaire: 1) historical, 2) experience, 3) education, 4) recommendation, and 5) implementation.

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[4] G. Ernest Anderson, Jr., "100 Uses for School Data Processing", The Nation's Schools, 78, No. 4, (October 1966), pp. 102-103.

A review of these items related to either individual or combined categories show that twenty-two have a historical basis. Eighteen represented some experience factors; while eight dealt with education related areas. Sixteen items pertained to items reflecting areas common to recommendations and implementation.

The training of educational administrators in EDP methods has been commonly accepted as being of the "do it yourself" variety. Presently, no institution of higher education offers a defined curricula in the area of data processing, let alone consideration of a curricula in Educational Data Processing.

Educational administrators who have provided the leadership for the development of Educational Data Processing by necessity have had to communicate their needs to technicians. Data collection, for the fourth category of this study, relates to Term Recognition. The perceived value of this data rests primarily with determining the extent that basic EDP terms has been assimilated into the

vocabulary of administrators involved in this study.

The inventory of basic EDP terms was compiled from four principal sources: 1) American Association of School Administrators' report "EDP and the School Administrator", 2) Sippl's Computer Dictionary, 3) suggestions from practicing EDP personnel, and 4) the author's personal experiences with EDP.

Accepting the premise that data is not information until it has been given interpretive meaning, the descriptive research and interview responses are presented, summarized and interpreted as separate topics in Chapter III.

Delimitations of the Study

As initially conceived the data for this study will encompass an investigation of ten (10) selected school districts in the State of Michigan.

Research that is relevant to the effect of Electronic Data Processing (EDP) upon the educational administrator is meager. This is due in great part to the recency of the technology in an educational environment.

The study documents the experience(s) of school districts and those administrators responsible for the introduction, implementation and policy-making role relating to the utilization of EDP.

In the course of the investigation, it was the author's purpose to establish a data base upon which to draw conclusions in the following areas:

1. What specific aspects of EDP do educational administrators understand?

2. Where does the educational administrator feel a lack of EDP knowledge?

3. What aspects of data processing does the educational administrator actually use in his work?

4. What aspects of EDP procedures should the administrator understand?

5. What does the educational administrator feel is important in his relationship to EDP activity?

6. What are the ways in which understanding of EDP can be gained?

7. What effect does information derived through data processing methods effect school operations?

8. Where, historically, has the primary effort in EDP development taken place?

Therefore, this study is concerned with looking at the non-technical rather than the technical criteria relating to the administration and utilization of EDP in education.

Educational Significance of the Study

Educational Data Processing (EDP) has existed in the State of Michigan for approximately a decade. Little effort has been made to investigate the influence of the development of EDP upon the educational administrator. This study attempts to provide useful information to the educational administrator relative to discernable patterns that have evolved in EDP utilization within the State of Michigan during the past decade.

While it is not the purpose of the study to dwell upon the concepts and techniques relating to EDP, it is hoped that the information which follows will be helpful in establishing a point of reference and encourage practicing administrators to further inquiry about EDP.

CHAPTER II

REVIEW OF RELATED LITERATURE

Attention in this chapter is given to existing literature bearing upon the general content of this study.

The two terms basic to this study are DATA and ADMINISTRATION. Data as defined by the dictionary is material serving as a basis for discussion, inference, or determination of policy; while administration relates to the principles, practices and rationalized techniques employed in achieving the objectives or aims of an organization. The acceptance of these general parameters of definition, while open to interpretation, provide the basis for identifying administration function and role.

That a recognized kinship exists between DATA and ADMINISTRATION is self-evident; an extension of this premise would be that educational administration cannot exist without Educational Data Processing.

Perspective

The magnitude of the needs and demands upon social institutions wrought by technological change has only

begun to be recognized as a problem. The antecedent of our present dilemma lies with the advent of automation.[5]

Automation has been characterized as a philosophy of technology - - a set of concepts.[6] From these concepts have been spawned the emerging disciplines of Computer Science, Information Systems Science, Cybernetics and related areas. The rapid development of these technological sciences have contributed to dislocations in our existing social institutions whether they be business, government, industry or education.

Sackman[7] expresses the view that automation is generating social dislocations because it is conceived as a technological problem rather than a human problem.

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[5]The word "automation" was coined in 1946 by Delmar S. Harder, Vice President, Ford Motor Company. Newsweek, January 25, 1965, p. 73.

[6]John Diebold, Beyond Automation, (New York, McGraw-Hill Book Company, Inc., 1964), p. 132.

[7]Harold S. Sackman, Computers Systems Science and Evolving Society, (New York, John Wiley & Sons, 1967), p. 556.

In Sackman's view, the challenge to society is the development of a social intelligence which is able to meet the cultural transformation not in the optimization of machines (computers).

Diebold[8] commenting upon the effects of automation develops a somewhat different premise.

> Automation does not "cause" anything. To attribute inherent evils to automation or technological change is like aiming at the shadow instead of the object . . . For years we have allowed the use of phrases such as "Automation causes" erroneously to direct our approach to the subject. These phrases are really shortcut ways of saying, "when we apply a set of automation techniques, these set of results occur". Our own actions or inactions actually cause the results.

Writing of the impact of computers upon Education, Goodlad[9] expresses the same theme that there are

> fears that automation will bring into Education the anonymity and dehumanizing now apparent in many aspects of daily life. Such fears must be reckoned with. They are not new to civilization, to dispel them man must look inside himself - not the computer. Computers have no mechanism of self-interest; man does.

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[8]Diebold, op. cit., p. 183.

[9]John I. Goodlad and Others, Computers and Information Systems in Education, (New York, Harcourt, Brace & World, Inc. 1966), p. 104.

The foregoing points of view underscore the problem of integrating automated systems within existing organizations. The problem in any new field of endeavor as Dearden[10] observes is

> there is frequently no universally accepted definition for many terms. It, therefore, becomes nearly impossible to question the validity of concepts underlying the terms because their meanings are different to different people.

The emergence of electronic data processing (EDP) is a relatively recent phenomenon. There is general consensus that electronic data processing is in its infancy. By contrast, Educational Data Processing is in its gestation period.

A review of the literature would suggest that Educational Data Processing for the purpose of using automated systems in meeting educational needs (administrative and instructional) is only beginning to emerge. There is a significant absence of relevant literature that can be termed "Educational Data Processing".

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[10] John Dearden, "The Myth of Real Time Management", Harvard Business Review, (March-April, 1964), p. 12.

Current literature reveals that hardware (computers) and software (language) development is not significantly different in educational and non-educational environments. The differences lie primarily in organizational goals while bringing to bear the existing software or modification thereof in meeting these goals.

Laver[11] observes that the history of computers is so recent and the pace so rapid that, presently, no man can claim to have spent his lifetime in the computing field. He further draws the analogy that ". . . computers are the fruit flies of technology, whose rapid generation are used to test mutations in methods and components."

Therefore, for purposes of meeting the general parameters of this study with its supportive data, Educational Data Processing (EDP) is used as a means of identifying activities that have occurred in an educational environment, however, relevant literature will be drawn from educational and non-educational sources.

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[11] Murray Laver, "User's Influence on Computer Systems Design", Datamation, XV, No. 10, (October, 1969), p. 107.

Overview

Historically, the Hollerith punched card was used in the dicennial census of 1890. It is still a basic method of creating or capturing information for further processing and/or analysis.

The advent of modern EDP was ushered into being only a generation ago (1946) with the introduction of the electronic digital computer. The rapid development of this technology is the reason why EDP has become synonomous with an era that is characterized by rapid change and complexity.

Martino[12] writing in the Computer Yearbook traces this growth:

> In 1949, only two computers were operating. In 1953, there were 20, by 1957 there were 200, by 1961 there were 2000. We talked about a 20,000 computer population. Today, the computer population is close to 40,000 and the number on order, another 40,000. If these figures are extrapolated one can gauge the full measure of the computer explosion.

The potential of the computer was immediately recognized. Unlike the first industrial revolution, which

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[12] R. L. Martino, "Information, Systems and Management" Computer Yearbook and Directory, (Detroit, American Data Processing Institute), 1968, p. 23.

extended man's physical power, the computer revolution has the potential to extend man's intellectual power. More important, its impact has been greater in a shorter period of time.

Diebold[13] commenting upon the influence of machines in society observes that

> machines have always been important to us, primarily, as agents of change. We use the very term "industrial revolution" not because of the revolutionary machines of James Watt and Richard Arkwright, but rather because they created a whole new environment for mankind - a whole new way of life. Today's crop of machines is a far more powerful agent than was that of the first industrial revolution.

Although no evidence exists to suggest a modern Luddite[14] movement arising, the concerned layman's inability to comprehend the role and impact of computers upon social institutions is understandable. EDP has created what appear to be irresolvable dichotomies.

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[13] Diebold, op. cit., p. 6.

[14] Luddite - In English industrial history (1811-16), any of a band of workmen who rioted to wreck new textile machinery in the belief that its introduction reduced wages and increased unemployment. The term was named after Ned Lud.

Issacs[15] enumerates some of the more prevalent characteristics that are attributable to the computer:

> It is all knowing and wise,
> It is simple minded, all it
> can do is add and subtract.
>
> It is costly,
> It is frugal.
>
> It lacks initiative. It does
> nothing more than what man
> programs it to do.
> It is creative. It finds new
> ways of recognizing patterns.
>
> It is a threat to men and women
> in all walks of life. It eliminates
> jobs if not whole occupations.
> It is a boon to mankind. It
> relieves the human of boring rote
> tasks and augments his creativity.

The brief history of Educational Data Processing (EDP) has made it obvious that the computer is useful in an educational environment. Its use as an administrative tool is being adopted widely.

It would be premature to suggest that EDP has been overwhelmingly successful. There is speculation that the future effects of EDP upon administration will be wide-

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[15] Herbert H. Issacs, "Computer Systems Technology: Progress, Projections, Problems", Public Administration Review, XXVII, No. 6 (November/December 1968), p. 488.

ranging and pervasive; however, the literature also reveals considerable controversy over its (EDP) present effectiveness.

In the Education Index (1957-59) no category or reference to Electronic Data Processing exists; in 1961, forty-five references are noted. Approximately one hundred and fifty references appear in the 1968 edition.

A review of these references reveals that the overwhelming number of references are curriculum oriented and exploratory in nature. Although it suggests great interest in the computer's potential instructional capability, it is also true that instruction based upon computer utilization has yet to prove its cost and/or instructional effectiveness.

The remaining literature deals primarily with task oriented administrative services (i.e., payrolls, grade reporting) of a clerical nature.

The introduction and utilization of EDP in a public school environment has been fragmented. Reliable statistics are not available. Vendor lists do not indicate how equipment is being used or how many schools are using someone else's equipment nor how many cooperative ventures exist.

However, evidence to support increased EDP activity in an educational environment range from increased vendor sales, increased service bureau activity and growing regional activity; additional evidence of growth and interest in developing educational data processing has come in the form of federal subsidies or grants.[16]

In the year ending 1967, one hundred and twelve school districts in the nation shared in $14,631,875 in project funds for innovative developments in administrative services, student programming and instructional development utilizing computer technology.

Two notable projects in Michigan shared in these funds: 1.) The Integrated Educational Information System (IEIS)[17], involving the counties of Macomb, Oakland, Wayne and the City of Detroit, and 2.) The Waterford Schools Individualized Communications (INDICOM) Program.[18]

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[16] _____, "ESEA Title III Projects involving use of Data Processing Systems", AEDS Monitor, VI, No. 5 (December 1967), p. 12.

[17] _____, Integrated Educational Information Systems, Project No. 67-4475 - IEIS.

[18] _____, Individualized Communications Systems, Project No. OE 67-4301 - Indicom - 1967.

The rapid development of EDP is evidenced not only by expanding EDP activity but in increasing costs.

An insight into the growing expenditures required for EDP facilities can be cited when contrasting government grants to twelve school districts totaling more than fourteen and one-half million dollars or an average of $121,900 per district to the 1958 Nation's Schools[19] survey which reported eighty-two districts whose total EDP expenditures were $888,000 or an average of $10,800 per district. This comparison represents an eleven-fold increase in approximately a decade.

EDP in Michigan

EDP activity in Michigan has been in existence for approximately a decade.

Generally, the direction and initiative for using automated systems in an educational environment has come from the local and intermediate school districts. The Michigan Department of Education has not exercised a

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19 _____, "Machine Accounting and Related Services for School Administrators", The Nation's Schools, Vol. 61, (May 1958), pp. 65-84.

leadership role in coordinating the development of EDP. The result has been a fragmentary approach to the development of systems and procedures on a state-wide basis. The evolving "coordinating" role appears to be an emerging function of intermediate school districts for the constituent (local) districts. The overall problem of statewide coordination between intermediate school districts and a state plan has yet to be fully met.

A Michigan Department of Education survey[20] indicates that in 1969, of 716 local and 60 intermediate school districts, 89 districts (11.5 percent) reported using EDP equipment.

A summarization of the department's survey indicates the following:

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[20] _____, Michigan Department of Education, Data Processing Equipment Status Report, August 1969.

	LSD*	ISD*	Total
Using EDP Equipment	25	13	38
Using Computers	17	10	27
Using Unit Record Equipment	8	0	8
Contracted Service	1	3	4
Teleprocessing	7	5	12
Test Scoring Machine	2	0	2
Optical Scanner	5	4	9
K/P Data Collector	1	1	2
Audio Response Unit	0	1	1

*LSD - Local School District
*ISD - Intermediate School District

Although the information reported is helpful and indicative of present equipment utilization, it falls short of revealing the extent of EDP activity in Michigan. A survey of four counties reveals that 106 school districts are involved in EDP activity in varying degrees. The foregoing suggests that, at the local or intermediate levels, the pace of EDP activity has quickened.

Educational Administration and EDP

An underlying consideration in the adoption of EDP in an educational environment is a recognition that two systems exist; an educational system and a data processing system. Education, therefore, must address itself to and acknowledge that the latter (EDP) should service the former

(education).

The American Association of School Administrators (AASA)[21] recognizing that EDP is emerging as a significant tool created an EDP committee to appraise administrators of the emerging and possible future effects of automated systems upon educational administration. The charge to the committee was that

> particular emphasis was to be given to where data processing fits into the administrative hierachy and the superintendent's role in EDP.

The efforts of the EDP Committee of the AASA suggests an attempt by educational administrators to correct some initial experiences and establish a new posture toward EDP.

There is evidence in Kramer's[22] view that the issue of EDP has not been faced by educators. The result has been to blunder into hardware acquisitions inappropriate for their needs.

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[21]American Association of School Administrators. EDP and the School Administrator. A report prepared by the AASA Committee on Electronic Data Processing, Washington, D.C., American Association of School Administrators, 1967.

[22]Kenneth L. Kramer, "The Evolution of Information Systems for Urban Administration", Public Administration Review, XXIX, No. 4 (July/August 1969) p. 389.

Midway during the decade of the 1960's one of the findings of a report on the Application of Electronic Processing in Education[23] was that greater emphasis was placed upon new systems, new hardware and adopting new applications using EDP. However, not enough attention was being extended to utilize existing developments efficiently.

A more recent finding of the United States Office of Education's final report A Feasibility Study of A Central Computer Facility for an Educational System[24] indicates that

> although data processing has been managed successfully in many different ways in the educational enterprise, it is apparent that many, if not most, successes are the result of accidental evolution rather than careful design.

The foregoing findings are not presented to cast a reflection upon the efforts of many dedicated individuals

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[23] J. I. Goodlad, J. G. Caffey, J. F. O'Toole, and L. L. Tyler: Application of Electronic Data Processing Methods in Education, Cooperative Research Project No. F-026, January 1965.

[24] General Learning Corporation, A Feasibility Study of A Central Computer Facility for an Educational System, U. S. Department of Health, Education, and Welfare, Office of Education, Washington, D.C., 1968, p. 22.

who have pioneered the use of EDP as a potential administrative tool. Lest educational administrators become disheartened, similar findings are to be found in non-education environments. McKinsey and Company[25], a computer consulting firm surveyed twenty-seven large companies who have had extensive experience with computers. Their findings revealed that two-thirds of the companies were a long way from covering current outlays much less recovering their original investment. For purposes of this study, the significant finding relating to the reason for not receiving a "payback" was not technical competance but lack of managerial involvement. In essence, when those companies who were deriving unsatisfactory results from their computer operations viewed their EDP activities as accounting tools rather than a management tool, their EDP activities produced unsatisfactory results.

The foregoing does not imply that successful results have not been achieved in clerical operations adapted to EDP methods. The most profitable use of EDP methods in

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[25]John T. Garrity, Getting the Most Out of Your Computer, New York, McKinsey and Company, 1963.

business, industry, government and education has been in automating clerical operations. The unfortunate aspect of this approach has been that information has been viewed in segments rather than information bearing upon the total enterprise.

Despite the success of automating clerical routines, as Ream[26] points out "the gap between computers, technical capability and its practical application is growing wider".

Within an educational environment, the most formidable block to EDP progress, according to Goodlad[27]

> is not the state of the data processing art but our understanding of education as it presently operates and is likely to advance, especially our insight into the relationship between human beings involved and the vast organizational, instructional and various ad hoc techniques that presently constitute our educational system.

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[26] Norman J. Ream, "The Computer and Its Impact on Public Organization", Public Administration Review, XXVIII, No. 6, (November/December 1968), p. 501.

[27] Goodlad, op. cit., p. 102.

Initially, administrators were looking to automated systems to relieve their staffs of tedious clerical duties; however, society has placed additional burdens upon the educational enterprise. Reduced costs, increased productivity and greater efficiency are being demanded by its patrons. In turn have come increased requests for data from taxpayers and researchers representing local, state and federal sources. To meet these needs as Miller[28] indicates

> management information must be integrated in terms of the various past, present and intended future programs. The program must be planned forward for several years.

Presently, the impact of EDP upon educational administration has been minimal. Administrators now in the field, generally, have learned on the job. Aside from a course or summer workshop, no institution of higher education has developed or incorporates a curricula which bears upon EDP's present or potential influence on administrative theory or practice.

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[28]James Miller, "Top Level Information Flow", in Computers and Education, R. W. Gerard. (New York: Harcourt, Brace and World, Inc., 1966), p. 242.

While it might be suggested that innovators and predictors of change have, in many instances, out-distanced their claims, the consequences of the computer-based information systems must be met. Wilkins'[29] view is that despite present limitation in EDP utilization, it is reasonable to say that the computer can do anything that it is told to do. As Drucker[30] points out

> the strength of the computer lies in its being a logic machine. It does precisely what it is programmed to do. It also makes it a total moron; for logic is essentially stupid. It is doing the simple and obvious. The human being, by contrast is not logical; he is perceptual. This means that he is slow and sloppy but he is also bright and has insight; the human being can adapt.

In Drucker's[31] view, the greatest impact of the computer lies in its limitations, forcing man increasingly to make decisions. The decision-making process goes to the

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[29]Leslie T. Wilkins, "Computer Impact on Public Decision Making", Public Administration Review, XXVIII, No. 6 (November/December 1968) p. 504.

[30]Peter F. Drucker, The Effective Executive, (New York, Harper and Row, Publishers, 1967), p. 159.

[31]Ibid., p. 159.

heart of the role of administration in setting the objectives of an organization and then allocating resources to meet the objectives. In utilizing EDP as an administrative tool, Hearle[32] views administration and the decision-making function as

> largely a process of handling information, selecting it, comparing it, acting upon it. The comparison function is the essence of decision-making - it touches setting goals, establishing programs, evaluating progress. Acting upon these comparisons is that personal step of human will which no machine can ever undertake.

The human problem and its relationship to EDP are far more significant and far-reaching than the technical ones. As Kraemer[33] indicates "less has been achieved in solving the human problems than in finding ways to apply the computer for administrative purposes." To accomplish the task, extensive education and training in the educational enterprise are required. To successfully

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[32]Edward F. R. Hearle, "Computers in Public Administration", Public Administration Review, XXVIII, No. 6 (November/December 1968), p. 487.

[33]Kenneth L. Kraemer, "Urban D. P.", Datamation, XIII, No. 8, (August 1967), p. 68.

automate education, insights into educational needs must be made available at all levels of the educational enterprise - - policy-level, administration, staff (teaching and non-teaching) and programs. The effort to date and immediate prognosis is not encouraging.

The effectiveness of automated systems will not have a significant impact or improvement upon general administrative practices in education until education and educational administrators develop an understanding of what automated systems are capable of doing. In effect, to meet the increasing demands upon themselves and their enterprises, they must shift from mental manual data processing to automated systems orientation.

This change or re-orientation does not imply that they (administrators) become technicians. The answer may lie in the training of Miller's[34] "perceptive generalist" who must

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[34]Van Miller, "The Superintendent of Schools" in D. J. Leu and H. C. Rudman, Eds., Preparation Programs for School Administrators, (East Lansing, Michigan: Michigan State University, 1963), Chapter 5.

> know enough of the general field and enough of the nature and problems of the specialist so that he can communicate with them with understanding, comprehensible among the specialist as a collective group and meaningful between specialist and the general public.

This view is echoed by Raferty[35], who maintains that although technological changes have been remarkable; equally remarkable has been the rate of change. In his view, top management, who usually have no time to be expert on anything, must receive and act upon the advice of specialists. In Raferty's rationale, the age of automation has brought forth a requirement for a new breed who can appraise the impact of information derived from specialist and mold technologies and personalities into programs. His answer to accomplish this task is the advent of

> a broad generalist with some depth in many fields, yet having the ability to evaluate the impact of developments over a broad range of specialties. Not a "Jack-of-all-trades and master of none", but individuals whose training in several disciplines is cemented with a firm foundation of technical fundamentals, practical ex-

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[35]C. R. Raferty, "Management Cannot Use a Parochial Viewpoint", The Office, 67, No. 1, (January 1968), p. 75.

> perience . . completely objective and able to specialize temporarily, but intensively as necessary.

The two foregoing views are reinforced by the American Association of School Administrator's Commission on Administrative Technology in its report Administrative Technology and the School Administrator.[36] The report suggests five organizational levels relating to a technological adaptation to an educational environment. Significantly, the first and second level administrators are viewed as essentially generalist or comprehensivist whose concern is for the total system and coordination of all units.

There is much to suggest that EDP information systems have only begun to emerge. There, also, is much to suggest that although automated systems represent a revolutionary approach in aiding administrators, their use has been hampered by a mystique that has surrounded its development and utilization by non-technicians.

An encouraging note for the mere mortal administrator

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[36] Administrative Technology & the School Executive, edited by Stephen J. Knezevich, (American Association of School Administrators, Washington, D.C., 1969), pp. 108-109.

is sounded by Wilkins[37] when he indicates that presently, computers are not capable of doing many things; human intelligence can do some things faster or better than computers. He suggests twelve areas worthy of consideration as to the present limitations of the computers in general use.

Computers cannot:

1. Set the boundary conditions for any problem.
2. Define a problem.
3. Say how worthwhile it is to explore a particular problem in the first instance; hence it cannot indicate the rational use of resources of money or persons in work on an original problem.
4. Imagine the variable or other information which might be relevant to consideration of a problem.
5. Decide what to include or exclude in the initial operations on a problem.
6. Select the functions to be explored.
7. Make decisions regarding the range to be covered by any included variable.
8. Construct a model.
9. Select the criteria to be explored.
10. Decide how to collect the basic data.
11. Decide upon a strategy of operation, such as deciding what proportion of resources should be devoted to different stages of a problem or means for a solution.
12. Design or evaluate a sensitivity analysis.

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[37] Wilkins, op. cit., p. 503.

The brief history of EDP's development and utility as a management device has produced varying points of view as to its use and effectiveness. The literature would suggest that the full impact of EDP information systems is yet to be realized. Further, there appears to be little disagreement as to the limitless possibilities of automated information systems.

A disquiet exists, however, that educational requirements to facilitate the use of EDP systems have not kept pace with technological developments. Presently, EDP methods are expanding rapidly in educational environments but a communications gap persists between the technology and the user.

Educational administrators adopting automated systems as a means of meeting organizational needs have been left, in great measure, to their own resources in bridging a technological chasm.

CHAPTER III

PRESENTATION OF FINDINGS

The research from field investigation of EDP and its relationship to educational administration are presented in this chapter.

The data is separated and presented in four categories. The field investigation results are also presented using individual as well as composite tables. The data appear in the following sequence:

1. Historical-Descriptive Data of the School District
2. EDP Applications and Utilization
3. Interview Responses
4. Term Recognition

Historical-Descriptive Data of School Districts

Ten school districts were selected for the sample in this study. The selection of items which relate to the physical and financial characteristics of the districts establish a point of reference consistent with the purposes of this study. The findings provide insights to the study

primarily in establishing similarities and/or differences that exist among school districts adopting automated systems.

Eight school districts used in the sample reflected the 6-3-3 organizational plan which is the one most commonly found in the State of Michigan. Two of the districts are classified as Intermediate school districts.

TABLE 1

TYPE OF SCHOOL ORGANIZATION PLAN

Organization	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
6-3-3	x	x	x	x		x	x	x	x		8
5-3-4											
8-4											
Other[a]					x					x	2

[a]Intermediate school districts

While no criterion was established regarding the size of the school districts, Table 2 indicates that only two of the school districts were serving school populations of less than 10,000.

TABLE 2

NUMBER OF STUDENTS SERVED

Population in Thousands	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
Under 5											
5- 9	x		x								2
10-14											
15-19		x					x		x		3
20-24								x			1
25-30						x					1
Over 30				x	x					x	3

To implement and conduct the instructional programs of the districts, six of the districts employed in excess of 500 staff members. Of these six districts, two employed in excess of 700; while three had more than 800 professionals. The remaining four districts employed less than 500; two of these districts were Intermediate schools whose staffs might be more aptly called consultants. The remaining two districts required 200 to 400 professional staff members to maintain their instructional program as indicated in Table 3.

TABLE 3

NUMBER OF PROFESSIONAL STAFF

Staff[a]	Districts										Total
	1	2	3	4	5	6	7	8	9	10	
Under 100					x						1
100-199										x	1
200-299	x										1
300-399			x								1
400-499											
500-599									x		1
600-699											
700-800		x					x				2
Over 800				x		x			x		3

[a]Professional staff includes total teaching staff

Table 4 relates to the administration and supervision of the affairs of the sample districts. Six of the school districts had forty or more administrators. Of these six districts, one had 40 to 50 administrators while two had between 60 to 70. One district employed between 70 to 80 administrators; while two school districts employ in excess of eighty administrators to manage their educational enterprise. Of the three districts with less than forty administrators, two are Intermediate school districts possessing

less than twenty administrators. The two remaining districts had less than twenty administrators.

TABLE 4

NUMBER OF ADMINISTRATORS

Administrators	Districts										Total
	1	2	3	4	5	6	7	8	9	10	
0-10					x						1
10-19	x									x	2
20-29											
30-39			x								1
40-49							x				1
50-59											
60-69		x							x		2
70-80								x			1
Over 80				x		x					2

The operating budgets of the ten districts indicate that a majority (six) have budgets in excess of eleven million dollars. Two of the districts as indicated in Table 5 had budgets under five million dollars (actually the amounts were under three million); while two districts maintained their institutions on budgets of five to six million dollars. Of the remaining districts, one allocated between ten to eleven million dollars; while two budgets were between fourteen and fifteen million dollars. Three

districts needed in excess of fifteen million dollars to maintain their educational enterprises.

TABLE 5

OPERATING BUDGET DOLLARS (1968-69)

Budget in Millions	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
Under 5					x					x	2
5- 6	x		x								
6- 7											
7- 8											
8- 9											
9-10											
10-11											
11-12									x		1
12-13											
13-14											
14-15		x					x				2
Over 15				x		x		x			3

When operating budgets were translated into average per pupil expenditures, the sample districts, excluding the Intermediate school districts, were expending an average of between 700 to 750 dollars (Table 6) as compared to the state average of 696 dollars for the fiscal year 1968-69.

TABLE 6

PER PUPIL EXPENDITURE (1968-69)

Expenditure in Hundreds	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
500-549					x					x	2[a]
550-599			x								1
600-649	x								x		2
650-699											
700-749							x				1
750-799				x		x		x			3
800-849											
850-899											
900-950		x									1
Over 950											

[a]Intermediate Districts - no per pupil cost maintained

The total millage which included allocated, extra voted and debt retirement, needed to maintain programs and services ranged between 29 to 39 mills as indicated in Table 7.

TABLE 7

VOTED MILLAGE[a] (1968-69)

Mills	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
Under 15					x					x	2
15-18											
19-20											
21-22											
23-24											
25-26											
27-28											
29-30							x				1
31-32	x		x						x		3
33-34		x				x					2
35-36				x							1
37-38								x			1
39-40											
Above 40											

[a]Total includes allocated, extra voted and debt retirement

EDP budgets ranged from a low of 45 thousand dollars to above 150 thousand dollars (Table 8). EDP budgets found half of the districts expending less than 75 thousand dollars while the remaining districts found it necessary to spend in excess of 140 thousand dollars. The dollar amounts reflect districts that have purchased (low dollar figure) as opposed to districts leasing hardware under vendor contracts.

Seven districts leased their equipment. The remaining three purchased and, also, leased peripheral equipment.

TABLE 8

EDP BUDGET[a]

Budget in Thousands	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
45 - 49			x						x		2
50 - 54	x										1
55 - 59											
60 - 64											
65 - 69								x			1
70 - 74							x				1
75 - 79											
80 - 84											
85 - 89											
90 - 94											
95 - 99											
100 - 104											
105 - 109											
110 - 114											
115 - 119											
120 - 124											
125 - 129											
130 - 134											
135 - 139											
140 - 144											
145 - 149		x									1
150 and over				x	x	x				x	4

[a]Includes hardware, supplies, personnel, general operation

Table 9 indicates that seven EDP operations are expending from one-half to one percent of the school districts budget; while one is expending up to one and one-half percent. Two school districts are service bureau oriented with expenditures in excess of five percent of their total operating budgets.

TABLE 9

PERCENT OF TOTAL SCHOOL BUDGET FOR EDP

Percent	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
.5 - .9		x	x	x		x	x	x	x		7
1.0 - 1.4	x										1
1.5 - 1.9											
2.0 - 2.4											
2.5 - 2.9											
3.0 - 3.4											
3.5 - 3.9											
4.0 - 4.4											
4.5 - 4.9											
5.0 and over					x					x	2

Table 10 concludes the physical and financial data relating to the ten sample districts and reflects the recency of EDP in an educational environment. Although there have been three generations of EDP utilized in this brief time, the average number of years experience for all districts was 7.2 years.

TABLE 10

SCHOOL DISTRICT EXPERIENCE WITH EDP

Experience	Districts										
	1	2	3	4	5	6	7	8	9	10	Total
Less than 3 yrs											
4 yrs											
5 yrs	x				x						2
6 yrs		x	x					x			3
7 yrs							x		x		2
8 yrs						x					1
9 yrs											
10 yrs										x	1
More than 10 yrs				x							1

EDP Utilization

One measure of the growth of EDP technology in a school environment is the number of administrative services that have been converted to automated systems. The presentation and findings of data relating to administrative

services utilized in the sample of ten selected Michigan school districts are presented in this segment of the study.

The yardstick used to determine the extent of EDP utilization encompasses fourteen categories and one hundred specific areas of EDP applications suggested by G. Ernest Anderson.[36]

Acknowledging that EDP methods applied to Administrative Services reflects the needs of each school district and, therefore, represent differences as to how and why EDP was introduced, an analysis of the data (Table 11) reveals that automated systems applied to the fourteen major categories indicate a category utilization of 82.1 percent.

TABLE 11

EDP APPLICATIONS UTILIZATION SUMMARY BY CATEGORY

Category	Key: x - Operational o - Not Operational										
	Districts										
	1	2	3	4	5[a]	6	7	8	9	10[a]	Percent
Accounting/Budget	x	x	x	x	x	x	x	x	x	x	100
Payroll	x	x	x	x	x	x	x	x	x	x	100
Purchasing	x	x	x	x	x	x	x	x	x	x	100
Supplies/Inventory	o	x	o	x	o	x	x	x	x	o	60

[36]Anderson, op. cit., p. 10.

TABLE 11 - Continued

Category	Key: x - Operational o - Not Operational										
	Districts										
	1	2	3	4	5[a]	6	7	8	9	10[a]	Percent
Accts. Payable/Rec.	x	x	x	x	x	x	x	x	x	x	100
Maintenance	o	o	o	o	o	o	o	o	o	o	0
Cafe. Accounting	o	o	x	o	o	x	x	o	o	x	40
Instruc. Mat. Record	o	o	x	x	x	o	x	x	o	x	60
Personnel	x	x	x	x	x	x	x	x	x	x	100
Pupil Census-Survey	x	x	x	x	x	x	x	x	x	x	100
Registration	x	x	x	x	x	x	x	x	x	x	100
Attendance	x	x	x	x	x	x	x	x	x	x	100
Grade Reporting	x	x	x	x	x	x	x	x	x	x	100
Miscellaneous	o	x	x	x	x	x	x	x	x	x	90
Total Applications	9	11	12	12	11	12	13	12	11	12	

Category Utilization for All Districts 82.1 percent

[a]Districts having a service bureau operation only

An analysis of Table 12 showing EDP utilization within each category by each of the sample districts reveals a category utilization of 51.6 percent. Detailed analysis of each category can be found in Appendix B.

TABLE 12

EDP APPLICATION
SUMMARY WITHIN CATEGORY

Category	Percent of all items within each category for all districts
	Percentage
Accounting/Budget	70.0
Payroll	100.0
Purchasing	61.7
Supplies/Inventory	22.0
Accts. Payable/Rec.	63.3
Maintenance	00.0
Cafe. Accounting	25.0
Instruct. Mat. Record	26.0
Personnel	44.3
Pupil Census-Survey	75.0
Registration/School	65.2
Attendance Accounting	60.0
Grade Reporting	57.3
Miscellaneous	52.4

Percent of Combined District/Category Utilization:

51.6 percent

Table 13 summarizes the Miscellaneous EDP activity which gives some insight into current attempts to further EDP utilization. Many of these items constitute a major EDP application effort, particularly those related to Computer Assisted Instruction (CAI), Computer Based Instruction (CBI) and Teleprocessing.

TABLE 13

SUMMARY OF MISCELLANEOUS APPLICATIONS

Item No.	Application	Districts										Total
		1	2	3	4	5	6	7	8	9	10	
1	School Insurance Accounting						x			x		2
2	Administrative Role of Staff			x								1
3[a]	Salary Proposal/Analysis		x									1
4[a]	Printing Text of Contracts								x			1
5	ID of Pupils w/Handicaps/ Special Needs			x	x	x	x	x		x		6
6	Population Studies			x	x		x	x		x		5
7	Dropout Analysis						x		x			2
8	Dropout Prediction						x					1
9	Misconduct Reports						x					1
10	Summary of Ability vs. Achievement				x							1
11[a]	Computer Based Instruction		x	x					x	x		4
12[a]	Computer Assisted Inst.									x		1
13[a]	Computer Managed Instruction									x		1
14[a]	Vocational Instruction		x	x	x		x	x	x	x		7
15[a]	Item Analysis of Subject Matter Tests										x	1
16[a]	Test Scoring/Analysis				x	x					x	3
17[a]	Teleprocessing-Admin. Ser.	x	x				x	x			x	5
18[a]	Teleprocessing-Student Ser.	x									x	2
19[a]	Software-Hardware Compatability	x	x				x	x			x	5
20	Health Dental Records						x					1
21[a]	Voter Registration-Analysis							x				1

[a]Applications developed by school districts that are additions to the original "Miscellaneous" but used in the study

Table 14 is presented using the fourteen categories as a basis of comparison between the initial (original) reasons for adopting automated systems and present activity utilizing EDP.

TABLE 14

RANK COMPARISON OF ORIGINAL AND PRESENT EDP CATEGORIES

Item No.	Original Categories	Rank Order	Present Categories	Rank Order
1	Payroll	1	Payroll	1
2	Miscellaneous	2	Census Survey	2
3	Census Survey	3	Accounting-Budget	3
4	Regis./Sched.	4	Regist./Sched.	4
5	Grade Reporting	4	Accts. Pay./Rec.	5
6	Accts. Pay./Rec.	5	Purchasing	6
7	Accounting-Budget	5	Attendance Acct'g	7
8	Attendance-Acct'g	6	Grade Reporting	8
9	Personnel	6	Miscellaneous	9
10	Purchasing	7	Personnel	10
11	Supply Inventory	8	Inst. Mat. Record	11
12	Cafe.-Accounting	8	Cafe. Accounting	12
13	Inst. Mat. Record	8	Supply Inventory	13
14	Maintenance	9	Maintenance	14

A review of the findings in Table 14 suggests the following:

1. Rank ordering of the fourteen categories reveals that the ten sample districts, collectively, viewed EDP as holding

promise of assistance in nine categories. Six categories had dual rankings; while three categories had a multiple ranking.

2. Over a period of seven years, prevailing practice has crystallized to the degree that no dual rankings exist. This would suggest that actual practice with EDP has defined areas which lent themselves to meeting the needs of the school organization. Further, each category has evolved and/or established a definite place on a priority basis.

3. While payroll applications still ranks first as the application meeting the greatest need of the sample districts, significant changes in the rankings have occurred in the seven year period.

4. Original rankings would suggest that after automating payroll procedures, initial response to EDP was mixed since Miscellaneous applications hold the second ranking of the school districts involved. Irrespective of the fact that the number of Miscellaneous category applications have increased over a period of seven years, it presently occupies a ninth place in the rank order.

5. Significantly, those areas that, in and of themselves, require considerable clerical effort to maintain are being clustered to provide improved utilization of existing information.

6. Current practice would suggest that greater emphasis is being given to developing improved information and accountability in those areas relating to the financial operations of schools. Presently, six of the

seven (half of the categories) ranked items directly relate to providing improved data for the financial operation of the school districts involved. Originally, only four of the seven categories were devoted to this (financial) endeavor.

7. Student accounting applications suggest a stronger emphasis upon the clerical tasks related to student services with less emphasis upon data utilization for improvement of student services and related areas.

Analysis of Interview Responses

EDP functioning in a school environment is a relatively recent phenomena. The school districts selected for this study are representative of school districts having accepted and developed automated systems as means for improving the management policies and practices within their organization.

To determine the extent of problems relating to the adoption, implementation and growth of EDP in a school environment within the past decade, personal interviews were held with the superintendent, assistant superintendent and EDP director in each of the districts involved in this study.

An analysis of the responses (Table 15) suggest that the initiative for adopting EDP methods came from two principal sources: 1) central staff administrators and 2) superintendents.

TABLE 15

INITIATIVE FOR INTRODUCTION OF EDP

Initiative	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Superintendent	3	3	3	9
Board of Education				
Central Staff Admin.	4	5	3	12
Principals			1	1
Faculty	3	1	2	6
Other[a]	1			1
Total	11	9	9	29

[a]Intermediate school district

A review of Table 15 suggests that the imposition and direction for EDP came from the "top".

There is a further suggestion that superintendents as a group generally provided the leadership role for adopting automated systems (Table 16, 17). Nine of the superintendents occupied their positions prior to the introduction of EDP in their constituencies or were employed as assistant superintendents; while EDP directors, as a group, are relative newcomers having had little or no responsibility with the original decision for adopting EDP within the school district.

TABLE 16

ADMINISTRATIVE POSITION
WHEN EDP WAS INTRODUCED

Position	Yes	No
Superintendent	4	6
Ass't Superintendent	4	5
EDP Director	2	6
Total	10	17

TABLE 17

LENGTH OF TIME IN PRESENT ADMINISTRATIVE POSITION

Position	Years						
	0-2	2-4	4-6	6-8	8-10	Over 10	Total
Superintendent		1	1	2		6	10
Ass't Superintendent	1	2	1			4	8
EDP Director		5	3		1	1	10
Total	1	8	5	2	1	11	28

Table 18 reviews the original reasons for adopting EDP within the sample districts. It is a further analysis of data reported in Table 14 (p. 55). A review of the data establishes that with the sudden growth of school population during the decade of the 1960's, educational

administrators sought to find some means of relieving increasing clerical functions upon existing personnel and staff.

TABLE 18

ORIGINAL REASONS FOR ADOPTION OF EDP

Reasons	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Account'g/Budget'g	3	4	3	10
Payroll	9	7	6	22
Purchasing	2			2
Supplies/Inventory			1	1
Accounts Pay./Rec.	2	5	3	10
Maintenance				
Cafe. Accounting			2	2
Instruct. Mat. Rec.			1	1
Personnel	1	1	1	3
Pupil/Census	5	4	3	12
Reg./Scheduling	2	4	5	11
Attendance	1	1	1	3
Grade Reporting	2	3	6	11
Other[a]	5	4	4	13
Total	32	33	36	101

[a]Instruction
Test Scoring
Administrative Services
Budget Accountability

The consensus of opinion of the administrators was that EDP experienced some unfavorable reaction (Table 19), however, the majority (66.7 percent) felt that the nature of the reaction was not restrictive to developing an EDP facility.

TABLE 19

INITIAL UNFAVORABLE REACTION TO EDP

Reaction	Yes	No	Total
Superintendent	6	4	10
Ass't Superintendent	6	3	9
EDP Director	6	2	8
Total	18	9	27
Percent	66.7	33.3	100.0

Table 20 confirms these findings by not revealing a concentrated area of reaction. Their view is supported by Table 21 which indicates that the basis for reaction was concentrated primarily in two of seven areas: 1.) newness of EDP and 2.) change in established routines. These two reasons accounted for 47.8 percent of perceived reactions to EDP. This, however, was considered as normal to the introduction of any change in existing operations.

TABLE 20

SOURCE OF REACTION TO EDP

Source	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Board of Education	1	2	2	5
Faculty	2	3		5
Central Office		1	1	2
Public	1	1	1	3
Student Body				
Other[a]	2		2	4
Total	6	7	6	19

[a]Auditing Firm
Intermediate Office

TABLE 21

BASIS FOR REACTION TO EDP

Basis	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Budgetary	2	3	1	6	13.0
Newness of EDP	5	4	3	12	26.0
Job Security	1	3	1	5	10.8
Considered a Frill	2		2	4	8.7
Dehumanizing	2		4	6	13.0
Change in Est. Routine	4	2	4	10	21.7
Other[a]	3			3	6.5
Total	19	12	15	46	100.0

[a]Auditing Firm
Intermediate Office

It had been previously noted that the motivation for development of automated systems within a school environment came principally from a desire to relieve tedious clerical routines. The responses of the administrators confirm data found in the EDP utilization segment of the study.

The recommendation for adoption of EDP (Table 22) to controlling Boards of Education came from the superintendents. It is interesting to note that in interviewing subordinates they did not view the recommending action as a procedure or protocol on the part of superintendents but a self-directed action with support from subordinates.

TABLE 22

RECOMMENDATION FOR ADOPTING EDP

Recommendation	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Superintendent	5	6	3	14	60.9
Ass't Superintendent	2	2		4	17.4
Consultant					
Board of Educ./Member					
Other[a]	3	1	1	5	21.7
Total	10	9	4	23	100.0

[a]Instructional Coordinator Staff

The responses reflected in Table 23 generally indicated how EDP was introduced into an educational environment. Administrator's responses relative to who participated in a feasibility study reveals a typical pattern. In a majority of instances, a combination of central staff administrators (one or more persons) and vendors were involved not only in the study but effected the initial introduction and implementation of EDP.

Significantly, none of the districts used teachers or staff outside of the central office in their investigations and recommendations. This attitude implies a strong suggestion that initial attempts were oriented to offsetting increased clerical loads.

The school districts involved in the sample also reveal a general pattern of where outside assistance was obtained in the initial stages of converting to automated systems. Its value lies in verifying that sources, other than emerging role of the Intermediate school districts, were notably absent. Some assistance was obtained from universities; however, none of the ten districts acknowledged assistance from the State Department of Education.

TABLE 23

FEASIBILITY STUDY PARTICIPANTS

Participation	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Central Staff	3	5	3	11
Vendor	3	3	2	8
Administration	4	3	2	9
Teacher				
Consultants	2		2	4
Other[a]	3	4	3	10
Total	15	15	12	42

[a]EDP Coordinator
Citizen Committee
University
County School Board Association
County Superintendent Association

TABLE 24

OUTSIDE SOURCES USED IN EDP PLANNING

Sources	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
State Dept. of Educ.					0.0
Universities/Colleges	3			3	11.1
Intermediate District	7	4	5	16	59.2
Other[a]	7	1		8	29.7
Total	17	5	5	27	100.0

[a]Vendor
Management Consultant

One of the methods for the introduction of EDP is through the use of a systems analyst and systematic study of the organization's requirements for establishing a man-machine interaction within the existing organization.

Tables 25 and 26 indicate that although feasibility studies and use of a systems analyst were acknowledged, it would be an understatement to suggest that feasibility studies and the use of a systems analyst by present day standards were used. Vendors in their eagerness to exploit a market and educational administrators in their eagerness to find a way to alleviate pressing clerical problems joined in effecting the most rapid transition possible. In the majority of cases, implementation was a matter of facing a specific task and utilizing the vendor to accomplish an immediate goal.

TABLE 25

USE OF A SYSTEMS ANALYST OR ENGINEER

Response	Yes	No	Total
Superintendent	6	4	10
Ass't Superintendent	5	4	9
EDP Director	4	1	5
Total	15	9	24
Percent	62.5	37.5	100.0

TABLE 26

ADMINISTRATOR'S VIEW
OF NEED FOR FEASIBILITY STUDY

Response	Yes	No	Total
Superintendent	6	4	10
Ass't Superintendent	5	4	9
EDP Director	5	3	8
Total	16	11	27

Based upon their prior experiences with implementing an EDP system, superintendents were questioned about the present advisability (Table 27) with regard to using a systems analyst. The question brought mixed reactions reflecting their (administrators) non-technical backgrounds; while EDP directors were unanimous in their affirmations. Conversations with administrators tended to reveal a lack of information and understanding relating to the role of a systems analyst. To some degree, this was an indication of their reluctance to abdicate their traditional role or diminish their control by allowing major changes by systems people to occur.

TABLE 27

PRESENT ADVISABILITY
OF USING A SYSTEMS ANALYST

Response	Yes	No	Total
Superintendent	5	5	10
Ass't Superintendent	5	4	9
EDP Director	10		10
Total	20	9	29
Percent	69.0	31.0	100.0

A review of the responses indicate that initially, the major impetus for adopting EDP came from two sources, central staff and superintendents. Although some deviation exists from district to district, Table 28 suggests that the emerging pattern for establishing EDP policy and priorities is one of shared responsibility.

TABLE 28

ESTABLISHING EDP POLICY/PRIORITIES

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Superintendent	3	1	1	5	17.2
Associate-Ass't Supt.	1	2	1	4	13.4
EDP Director	1	1	6	8	27.5
EDP Committee	4	5	1	10	35.0
Other[a]	1		1	2	06.9
Total	10	9	10	29	100.0

[a]Administrative Team

Table 29 reflects the attitudes of administrators in their relationship to EDP.

While it is clear that administrators see themselves in a multiple role, it is significant that one-half of the superintendents felt they have a controlling influence regarding establishing EDP policy and priorities.

TABLE 29

ADMINISTRATOR'S RELATION TO EDP

Relationship	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing						
	S	Percent	A/S	Percent	EDP	Percent	Total
Controlling	5	23.8	1	04.5	4	25.0	10
Participating	6	28.6	6	27.3	5	31.1	17
Advisory	6	28.6	7	31.8	6	37.5	19
Recip./Services	4	19.0	8	36.4	1[a]	06.4	13
Total	21	100.0	22	100.0	16	100.0	59

[a]Has function other than EDP Director

When queried as to whom the EDP director should ideally report (Table 30), there were mixed reactions. A review of the responses would suggest that the EDP director should report directly to the superintendent. However, a review of responses of administrators other than EDP directors reveals that the majority (68.3 percent) felt that it should not be the superintendent. EDP directors expressed the opposite view. The rationale for their position is that EDP provides services to all segments of the educational institution. Their general belief was that experience has shown

priorities to the immediate superior's responsibility became the rule rather than the exception.

TABLE 30

IDEALLY - EDP DIRECTOR'S RELATIONSHIP TO ORGANIZATIONAL TABLE

Reporting to	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Superintendent	3	3	8	14
Deputy	2	2		4
Associate Supt.				
Ass't Supt. Finance	1	1		2
Other[a]	4	3	2	9
Total	10	9	10	29

[a]Organizational structure will determine reporting.
Third echelon administrator

In retrospect, administrators and EDP directors, while acknowledging problems of implementation existed, the majority (71.4 percent) indicated that conversion to EDP (Table 31) was made without serious disruption to existing operation within their school organizations.

TABLE 31

CONVERSION TO EDP

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	8	6	6	20	71.4
No	2	3	3	8	28.6
Total	10	9	9	28	100.0

Table 32 indicates that the majority of administrators felt that conversion to EDP was not made too fast.

TABLE 32

CONVERSION TO EDP - TOO FAST?

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	1	2	2	5	17.8
No	9	7	7	23	82.2
Total	10	9	9	28	100.0

While 82.2 percent of those interviewed conceded that initial conversions from manual methods to EDP methods were

appropriately made, the same attitude relating to using the same conversion approach today (Table 33) were not so nearly evident. Only 44.8 percent felt they would approach the conversion in the same manner.

TABLE 33

ADMINISTRATOR'S VIEW OF CONVERSION TODAY

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	3	5	5	13	44.8
No	7	4	5	16	55.2
Total	10	9	10	29	100.0

Table 33 appears to reveal an apparent contradiction to the problem of approaches to conversion. Upon further inquiry as to a present approach to conversion (Table 34), 69 percent of those interviewed modified their position to recognize that evolving hardware and software developments would require re-arranging priorities, but they maintained their positions relative to their original approach of conversion to EDP.

TABLE 34

PRESENT APPROACH TO CONVERSION

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Limit number of applications	1	1	2	4	13.8
More applications		1	2	3	10.3
Approach same way	2			2	6.9
Other[a]	7	7	6	20	69.0
Total	10	9	10	29	100.0

[a]Software and hardware would dictate approach

Superintendents and their assistants modified their positions principally because of their experiences with automated systems rather than from an understanding of the technical improvements which had occurred.

In responding to the question of whether discontent exists (Table 35) among staff and employees regarding EDP, the overwhelming response (93 percent) was NO. It is interesting to note that administrators and EDP directors conceded that discontent was evident but not to the degree that it impaired progress; rather, discontent represented isolated cases. Their response reveals no change in position

from their perception of reaction to the initial introduction of EDP in their constituencies.

TABLE 35

EVIDENCE OF DISCONTENT WITH EDP

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes		2		2	07.0
No	10	7	10	27	93.0
Total	10	9	10	29	100.0

Whether EDP has an effect on personnel requirements (Table 36) will continue to be a debatable topic based upon the reaction of those interviewed. Half (fourteen of twenty-eight) indicated existing personnel were replaced while the remaining responses indicate that anticipated personnel requirements were lowered. Those who indicated that existing personnel were replaced clarified their position that it would be more accurate to describe existing personnel replacement actually meant reassignment to other duties or possibly not filling vacancies.

TABLE 36

EFFECT OF EDP ON PERSONNEL REQUIREMENTS

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Replaced	4	4	6	14	50.0
Lowered	6	5	3	14	50.0
Total	10	9	9	28	100.0

How has the education administrator reacted to EDP produced information? A review of the responses to three obvious questions were positive. With only one exception, administrators were unanimous in acknowledging that EDP print-out reports were meaningful, reliable and current (Tables 37, 38, 39).

TABLE 37

ARE REPORTS MEANINGFUL?

Response	Yes	No
Superintendent	10	
Ass't Superintendent	9	
EDP Director	1[a]	

[a]Has function other than EDP director

TABLE 38

EDP INFORMATION RELIABILITY

Response	Yes	No
Superintendent	10	
Ass't Superintendent	9	
EDP Director	1[a]	

[a]Has functions other than EDP director

TABLE 39

ARE REPORTS CURRENT?

Response	Yes	No
Superintendent	9	1
Ass't Superintendent	9	
EDP Director	1[a]	

[a]Has functions other than EDP director

Lest an impression of satisfaction and complacency be assumed, administrators were quick to point out that, although, present EDP reports are far superior and encompassing than manually prepared reports, the need for further refinements to give meaningful and understandable information

at the appropriate levels of the school organization that can be used effectively must continue.

With respect to utilization of information of current reporting, Table 40 indicates that a rank ordering of items reveal that present reports are used for: 1.) analysis, 2.) a basis for action and 3.) forecasting needs.

TABLE 40

EDP INFORMATION UTILIZATION

Item	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
For Analysis	9	8	6	23	31.1
For Forecasting	7	8	5	20	27.0
Basis for Action	8	8	5	21	28.4
None of These	1	1		2	02.7
Other[a]	3	2	3	8	10.8
Total	28	27	19	74	100.0

[a]Decision making
Controlling budget
Management device

A review of the data relating to EDP utilization (Appendix B) clearly establishes and confirms a growing

acceptance of EDP. It does not imply that education administrators do not have concerns relating to their functioning in an EDP environment. Underlying this concern is the acknowledgment of the majority (65.5 percent) that a communication problem exists (Table 41). A consensus of those interviewed indicated that a communication problem existed between professional and non-professional employees and EDP when automated systems were introduced. The communication problem has persisted regardless of the number of years of experience with EDP.

TABLE 41

EXISTENCE OF A COMMUNICATION PROBLEM

Response	Yes	No	Total
Superintendent	7	3	10
Ass't Superintendent	6	3	9
EDP Director	6	4	10
Total	19	10	29
Percent	65.5	34.5	100.0

Generally, the basis for a continuing communications problem has been: 1.) an unfamiliarity with terminology and, 2.) a lack of technical knowledge as indicated in the

following table.

TABLE 42

BASIS FOR A COMMUNICATION PROBLEM

Communication Problem	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Lack of Technical Knowledge	6	3	2	11	31.4
Unfamiliar with Terminology	5	3	4	12	34.3
Other[a]	3	3	6	12	34.3
Total	14	9	12	35	100.0

[a]Lack of evaluation to determine effectiveness
Lack of in-service
Unfamiliarity with EDP requirements

Anticipating a communication problem with staffs, superintendents initially placed the development of EDP into the hands of educators rather than EDP specialists. Table 43 reveals that 82.7 percent of the districts followed this pattern. The basic premise of this action was a belief that it was easier to train an educator to become familiar with EDP than it was to train an EDP specialist to the needs of educators. Further, the opinion expressed by those

interviewed as to whether, in retrospect, their action was correct. Their response was an 86.2 percent affirmation that the educator-trained EDP administrator effected a faster conversion (Table 44) to automated systems than would have been possible using an EDP specialist.

TABLE 43

CHOICE OF EDP EDUCATOR DIRECTOR VS EDP SPECIALIST

Choice	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Educator	8	8	8	24	82.7
EDP Specialist	2	1	2	5	17.3
Total	10	9	10	29	100.0

TABLE 44

ESTIMATE OF CONVERSION TIME BY EDP DIRECTORS

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
More time	2	1	1	4	13.8
Less time	8	8	9	25	86.2
Total	10	9	10	29	100.0

This expression of confidence in educators with EDP skills reflects, in great measure, not a comparison of technical competance but rather the need to provide a liaison with personnel within school districts. It is a further extension of the problem of implementation expressed previously (p. 26) of maintaining control and procedures and practices in the hands of educational managers rather than systems oriented specialists.

In view of the continuing communications gap expressed by administrators, data was sought relating to past, present and future needs relating to programs of education, orientation and development of future educational administrators.

When administrators and EDP directors were asked whether they had received any EDP training, only one administrator responded negatively while the remainder responded affirmatively. The majority had some exposure (Table 45) to EDP concepts.

TABLE 45

EXPOSURE TO EDP CONCEPTS

Response	Yes	No
Superintendent	9	1
Ass't Superintendent	9	
EDP Director	10	
Total	28	1

An analysis of source of training (Table 46) reveals actually minimal formal training. Of those interviewed, 35.2 percent obtained vendor-oriented training of less than two weeks duration. Acknowledgment of the service rendered by vendors for their role was made not only for its EDP orientation but also to the skill of vendors in developing a new market. With the initial impetus provided by vendors, 25.9 percent considered their training as being self-taught; while 16.7 percent availed themselves of one or more technically oriented courses at universities. Other sources of training accounted for twenty-two percent of the training received.

TABLE 46

SOURCE OF EDP TRAINING

Source	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Vendor Sponsored Program	3	7	9	19	35.2
School In-Service	2	4		6	11.1
College/University	1	6	2	9	16.7
Self Taught	3	6	5	14	25.9
Have no training					0.0
Other[a]	3	1	2	6	11.1
Total	12	24	18	54	100.0

[a]Intermediate Office

An observation that can be made regarding the findings in the preceding table clearly underscores an inadequacy and a pressing need for relating the initial experiences of administrators with evolving skills required of educational administrators.

The consensus of those interviewed felt training in EDP was necessary (58.6 percent); while 41.4 percent felt it was only advisable. The point of view expressed by all administrators and reflected in Table 46 was that EDP training was a need; only the emphasis on what kind of training was open

to question. Concern was voiced over the lack of direction and progress in meeting this need.

TABLE 47

EXTENT OF EDP TRAINING

Extent	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Necessary	5	5	7	17	58.6
Advisable	5	4	3	12	41.4
Total	10	9	10	29	100.0

Data was sought to determine the extent of training (Table 47) that administrators felt was needed based upon the experience(s) with EDP. Ideally, 25.6 percent expressed the necessity for thorough training including "hands on" knowledge of equipment while only one expressed this approach as necessary or practical. Sixty and four-tenths percent felt equally that "understanding basic computer logic" (30.2 percent) and "understanding basic systems analysis" (30.2 percent) represented their essential needs in working with automated systems. Other scattered items

accounted for 14.0 percent of views expressed about the extent of training needed by administrators.

TABLE 48

ESTIMATE OF EXTENT OF EDP TRAINING NEEDED

Estimate	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Hands on Knowledge			1	1	02.3
Understand Basic Computer Logic	4	5	4	13	30.2
Understand Basic Systems Analysis	8	1	4	13	30.2
All of These	1	7	3	11	25.6
None of These		1		1	02.3
Other[a]	2	1	1	4	09.4
Total	15	15	13	43	100.0

[a]Understand software and hardware requirements
Know capability of computer

Sixty-nine percent of those interviewed felt that once the decision was made to adopt EDP the responsibility for training (Table 49) was primarily a school district responsibility. In retrospect, considering that the primary source for EDP orientation was the vendor, only two of

those interviewed felt that, presently, vendors were obliged to continue this practice.

TABLE 49

RESPONSIBILITY FOR EDP TRAINING

Responsibility	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Individual	2	2	3	7	24.1
School District	7	7	6	20	69.0
Vendor	1		1	2	6.9
Total	10	9	10	29	100.0

One indication that the adoption, growth and experience with EDP has had an impact upon administrators is evidenced by the response to the question, Do you see the training of future administrators changing as the result of EDP? Table 50 reveals that 93 percent of the administrators responded affirmatively.

TABLE 50

NEED FOR FUTURE TRAINING IN EDP

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	10	7	10	27	93.1
No		2		2	06.9
Total	10	9	10	29	100.0

With respect as to methods for training future administrators in EDP (Table 51), a minority of those interviewed could verbalize on specific ways. In the main, those interviewed were more comfortable to generalize. Thirty-five and seven-tenths percent felt that changes would occur through content of curriculum (university/college); 33.9 percent indicated that in-service would be a basic method for change; while 16.1 percent felt district sponsored programs would be needed. Fourteen and three-tenths percent accounted for "other" responses. The "other" responses reflect specific recommendation and are particularly insightful.

1. Departure from using cited authority as a basis for action and utilizing the

potential of the computer to determine administration needs and goals.

2. The future training and impact upon educational administrators and society, in general, by automated systems (computers) will not be felt until related concepts are a part of kindergarten through university programs.

TABLE 51

METHODS TO TRAIN FUTURE ADMINISTRATORS IN EDP

Methods	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Content of Curriculum	8	7	5	20	35.7
More In-Service	6	8	5	19	33.9
District Sponsored Training	4	2	3	9	16.1
Other[a]	2		6	8	14.3
Total	20	17	19	56	100.0

[a]Introduction of systems analysis training
Regional district responsibility
Departure from using cited authority as a basis for action
Stress concepts from kindergarten through university

Realistically, until programs are developed and implemented, administrators must be concerned as to how the transition could be made in the training of administrators until sufficient programs are available. Table 52 indicates that administrators were divided as to the method. Thirty-seven percent felt this to be a local responsibility supporting previous data that once EDP methods were adopted training was a local district responsibility. Twenty-five and six-tenths percent placed the responsibility for training with universities and colleges during the transitional period; while 20.9 percent felt that it should be the responsibility of the individual to present himself prepared with the necessary skills. The remaining administrators (16.3 percent) thought the solution of the problem would be, simply, to create a new position to interface with a growing technology.

TABLE 52

METHOD TO TRAIN ADMINISTRATORS DURING TRANSITION PERIOD

Method	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Individual Responsibility	2	3	4	9	20.9
University/College Program	5	4	2	11	25.6
Local District Assistance	6	4	6	16	37.2
Create New Position to Interface	1	4	2	7	16.3
Total	14	15	14	43	100.0

Information was sought to determine what, if any, effect EDP had upon the administrative processes. Administrators, generally, gave mixed responses; 72.4 percent felt that, as a result of the availability of information to them, their approach to decision-making has changed to some degree (Table 53). Further, on the basis of EDP produced information, 75.9 percent experienced some change in their administrative style (Table 54).

TABLE 53

EFFECT OF EDP UPON DECISION MAKING

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	6	5	10	21	72.5
No	4	4		8	27.5
Total	10	9	10	29	100.0

TABLE 54

EFFECT OF EDP UPON ADMINISTRATIVE STYLE

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	7	7	8	22	75.9
No	3	2	2	7	24.1
Total	10	9	10	29	100.0

Changes in administrative style (Table 55) and decision-making, however, did not appear, based upon available information, as being reflected in the administrator's ability to translate the school districts needs to community and staffs.

Administrator's responses indicated that while EDP was in no way a limiting factor in translating needs to staff and community, that as a group, only 42.1 percent felt it expanded this ability but, significantly, 57.9 percent saw no change in translating needs to community and staff.

TABLE 55

USE OF EDP TO TRANSLATE NEEDS TO COMMUNITY

Item	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	Total	Percent
Limits				0.0
Expands	7	1	8	42.1
No Change	3	8	11	57.9
Total	10	9	19	100.0

It had previously been reported that the growth and development of EDP is evolving into a shared responsibility (committee structure). Administrators were asked if the influence of EDP reporting tended to promote a team approach. Table 56 reveals that 72.4 percent answered affirmatively; while 79.3 percent felt that EDP based information promoted a team approach more (Table 57); while 20.7 percent felt that no change had taken place.

TABLE 56

EFFECT OF EDP UPON TEAM APPROACH

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Yes	9	6	6	21	72.4
No	1	3	4	8	27.6
Total	10	9	10	29	100.0

TABLE 57

EXTENT OF EFFECT UPON TEAM APPROACH

Extent	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
More	9	8	6	23	79.3
Less					0.0
No Change	1	1	4	6	20.7
Total	19	9	10	29	100.0

Collectively, the administrators were unanimous in their view that EDP did not restrict a team approach in the administrative process.

Table 58 possibly is the best indicator that EDP has found acceptance in an educational environment. In response to the question whether administrators would expand EDP facilities and programs if conditions permitted, administrators answered affirmatively and unanimously. Their response reflects a demand for more EDP services as indicated in Table 59.

TABLE 58

ADMINISTRATOR'S ATTITUDE TOWARD EDP EXPANSION

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
Yes	10	9	10	29
No				
Total	10	9	10	29

TABLE 59

STATUS OF EDP SERVICE REQUEST

Response	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing			
	S	A/S	EDP	Total
More	10	9	10	29
Less				
Total	10	9	10	29

The administrator's response was further supported by a review of how EDP services grew. Table 60 indicates that 41.5 percent was attributable to administration imposed policies; 43.9 percent of the demand for services came from the school district staff (as opposed to central staff). The significance of this increased demand by staff suggests that a broader base of acceptance and involvement with EDP is beginning to emerge. Significantly, also, only three administrators felt that the increased demand for services was prompted by a need to justify equipment costs. In the view of the majority of those interviewed, equipment cost justification was a subordinate reason for EDP activity.

TABLE 60

INFLUENCING FACTORS RELATING TO EDP GROWTH

Type of Influence	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Administration Imposed	6	5	6	17	41.5
Staff Demand	5	5	8	18	43.9
Need to justify equipment	1		2	3	07.3
Other[a]	1	1	1	3	07.3
Total	13	11	17	41	100.0

[a]Administrator inspired
Demands from local district

Seeking data to substantiate this view, administrators were asked on what basis were EDP costs justified (Table 61). A ranking of their responses indicate that: 1.) service (33.8 percent), 2.) accuracy of information (29.9 percent) and 3.) time-saving (25.3 percent) constituted the basis for EDP cost justification; while dollar savings to the school district in terms of reduction of personnel and related costs, was expressed by only 7.2 percent of the administrators. "Other" reasons accounted for only 4.8 percent. The "other" reasons represented an aspect of service. The net effect is that 94 percent of the cost justification is a desire for increased information services and not a claim of actual dollar savings to the school districts.

TABLE 61

COST JUSTIFICATION FOR EDP

Justification	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Dollar Saving	3	1	2	6	07.3
Service	9	9	10	28	33.8
Accuracy of Information	9	8	7	24	28.7
Time Saving	9	7	5	21	25.3
Other[a]	1	2	1	4	04.9
Total	31	27	25	83	100.0

[a]Greater availability of basic data

The proceeding information expressed the views of representative educational administrators who have taken a leadership role in pioneering the utilization of EDP methods as a tool to assist in their administrative responsibilities.

It is, therefore, appropriate to conclude this segment of the study reflecting the primary concerns of educational administrators regarding the future of Educational Data Processing. Their concerns are presented below in tabular form with the attention drawn to the 41.5 percent responses related to chief concerns labeled "other".

TABLE 62

FUTURE CONCERNS RELATIVE TO EDP UTILIZATION

Concerns	Key: S - Superintendent A/S - Ass't Superintendent EDP - Director of Data Processing				
	S	A/S	EDP	Total	Percent
Increasing Costs	3	2	3	8	19.5
Equipment Changes	2	1	1	4	9.8
Shortage of Qualified Personnel	5	5	2	12	29.2
Other[a]	7	5	5	17	41.5
Total	17	13	11	41	100.0

TABLE 62 - Continued

[a]Understand and utilize the potential of EDP
Develop technology for instructional needs
Derive maximum benefit from EDP
Ability to use the technology more efficiently
Coordination of EDP activity on a geographic basis
Development of Teleprocessing capability to meet users needs
Develop personnel for using the instructional capability of the computer

Term Recognition

Educational administrators in the State of Michigan have witnessed the introduction of EDP into an educational environment during the past decade.

The emergence of EDP, its rapid development and utilization as a significant administrative tool, has made it necessary for administrators to express and appropriately describe their needs in a technological context.

The administrator's training and role generally does not require nor does it place him in a position to keep abreast of the rapidly changing technical development related to EDP. Previous findings have demonstrated that much of the knowledge acquired by administrators relative to EDP has been fragmentary and of a "do it yourself" nature.

Refinements in hardware and software have resulted in a rapidly expanding EDP lexicon which further complicates the problem of communicating with the technician. Administrators, nevertheless, have a responsibility to become familiar with basic concepts, terminology and vocabulary related to EDP if they are to express their educational needs to the technician.

The following segment of the study attempts to establish the extent that basic concepts and terms peculiar to EDP have been assimilated into the vocabularies of administrators involved in this study.

The terms utilized in this survey (Appendix D) are a sampling. They are not intended as a definitive inclusive list. The terms selected for the study came from the following sources: 1) American Association of School Administrator's, 2) Sippl's Computer Dictionary, 3) suggestions from EDP personnel in the field, and 4) the author's personal experience with EDP.

Each administrator responded as to whether he was 1) familiar, 2) able to define, or 3) unfamiliar with the terms used in the study.

Term Recognition Findings

The findings, generally, substantiate that the administrator's knowledge of EDP has been informal and fragmentary.

The total responses to items in the sample by all administrators was 1421. A summarization of the responses

found in Table 63 reveals that administrators had assimilated 83.3 percent of the terms used in the study. Administrators acknowledged they were familiar with 42.0 percent of the terms and were able to define 41.3 percent; while indicating that only 16.7 percent were unfamiliar to them. In effect, administrators appear to have a command of the basic EDP terminology used in the study. A detailed analysis of responses (Tables 80, 81, 82, 83) can be found in Appendix D (pp. 173-175)

TABLE 63

COMBINED SUMMARY OF TERM RECOGNITION
FOR SUPERINTENDENT AND ASSISTANT SUPERINTENDENT

Summary	Key: TCR - Total Category Response TSR - Total Summary Response		
	TCR	TSR	Percent
Familiar	596	1421	42.0
Able to Define	587		41.3
Unfamiliar	238		16.7
Total	1421	1421	100.0

There is a suggestion based upon a comparison of Tables 64, 65 and 66 that superintendents and their

subordinates do not necessarily have the same facility with the terms used in the study in all categories. An inference would be that terms bearing directly upon their responsibility for the initial direction and implementation of EDP and present administrative needs have produced a selection appropriate for their role.

TABLE 64

TERM RECOGNITION - RESPONSE SUMMARY
SUPERINTENDENT

	Item	Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
1	Input	2	8	
2	Output	2	8	
3	Central Processor	2	8	
4	Random Access	3	7	
5	Tape Drive	2	5	3
6	On-Line	2	7	1
7	Address	3	6	1
8	Boolean Algebra	2	3	3
9	Digital Computer	3	6	1
10	Analog Computer	4	5	1
11	Edit Run	3	4	3
12	Back-Up System	3	6	1
13	Batch Process	5	4	1
14	Unit Record	5	5	
15	BIT	3	3	4

TABLE 64 - Continued

	Item	Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
16	Call-In	4	4	2
17	Storage Capacity	4	6	
18	Pert	4	3	3
19	Channel	4	2	4
20	Check	2	2	6
21	Cobol	4	4	2
22	Alpha-Numeric	4	4	2
23	Systems Analysis	4	6	
24	Mgm't Info. Systems	3	6	1
25	Application	4	6	
26	Assembler	5	2	3
27	Binary	6	3	1
28	Programmer	5	5	
29	Buffer	4	3	3
30	Bug	3	3	4
31	Byte	4	2	3
32	Card Code	5	3	2
33	Character	3	5	2
34	Real-Time	3	4	3
35	Collate	4	6	
36	Common Language	5	4	1
37	Compare	3	3	4
38	Compiler	5	3	2
39	Compatibility	6	4	
40	Configuration	6	4	
41	Console	6	4	
42	Cybernetics	2	7	1
43	Data	4	6	
44	Decision	5	4	1
45	Disk	5	5	
46	Erase	4	3	3
47	External Memory	3	3	4

TABLE 64 - Continued

Item		Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
48	Flow Chart	5	5	
49	FORTRAN	7	3	
50	Information Retrieval	2	6	2
51	Inquiry	2	6	2
52	Interface	4	2	4
53	Language	7	3	
54	Library	4	4	2
55	Location	5	3	2
56	Loop	5	2	3
57	LPM	2	2	6
58	Matrix	6	4	
59	Microseconds	5	4	1
60	Milliseconds	5	4	1
61	Nanoseconds	5	2	3
62	Off-Line	5	5	
63	Operations Research	4	3	3
64	Parameter	5	4	1
65	Critical Path Method	5	4	1
66	Program	5	5	
67	Run	5	5	
68	Operating Systems	4	6	
69	Mark Sensing	4	6	
70	Simulation	3	6	1
71	Software	4	6	
72	Sort	4	6	
73	Sequential File	5	3	2
74	Sub routine	4	3	3
75	System	5	5	
	Total	303	331	113

TABLE 65

TERM RECOGNITION - RESPONSE SUMMARY
ASSISTANT SUPERINTENDENT

	Item	Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
1	Input	4	5	
2	Output	4	5	
3	Central Processor	5	3	1
4	Random Access	6	3	
5	Tape Drive	4	4	1
6	On-Line	3	5	1
7	Address	3	2	4
8	Boolean Algebra	1	1	7
9	Digital Computer	6	3	
10	Analog Computer	1	4	4
11	Edit Run	6	3	
12	Back-Up System	5	4	
13	Batch Process	5	4	
14	Unit Record	4	5	
15	BIT	4	3	2
16	Call-In	4	3	2
17	Storage Capacity	4	4	1
18	Pert	4	2	3
19	Channel	4	2	3
20	Check		2	7
21	Cobol	3	4	2
22	Alpha-Numeric	4	4	1
23	Systems Analysis	4	5	
24	Mgm't Info. Systems	1	7	1
25	Application	6	2	1
26	Assembler	4	2	3
27	Binary		5	4
28	Programmer	6	3	

TABLE 65 - Continued

	Item	Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
29	Buffer	4	2	3
30	Bug	4	4	1
31	Byte	3	3	3
32	Card Code	5	3	1
33	Character	6	3	
34	Real-Time	4	3	2
35	Collate	4	5	
36	Common Language	3	4	2
37	Compare	3	3	3
38	Compiler	3	4	2
39	Compatibility	3	5	1
40	Configuration	3	4	2
41	Console	3	4	2
42	Cybernetics	5	1	3
43	Data	4	4	1
44	Decision	2	4	3
45	Disk	3	5	1
46	Erase	6	2	1
47	External Memory	3	4	2
48	Flow Chart	5	4	
49	FORTRAN	4	4	1
50	Information Retrieval	3	5	1
51	Inquiry	6	3	
52	Interface		4	5
53	Language	2	5	2
54	Library	3	3	3
55	Location	3	4	2
56	Loop	1	4	4
57	LPM		1	8
58	Matrix	4	4	1
59	Microseconds	6	3	

TABLE 65 - Continued

	Item	Key: F - Familiar AD - Able to Define U - Unfamiliar		
		Response		
		F	AD	U
60	Milloseconds	7	2	
61	Nanoseconds	6	1	1
62	Off-Line	4	3	2
63	Operations Research	5	2	2
64	Parameter	3	4	2
65	Critical Path Method	5	3	1
66	Program	6	3	
67	Run	6	3	
68	Operating Systems-OS	5	2	2
69	Mark Sensing	4	5	
70	Simulation	5	3	1
71	Software	5	4	
72	Sort	5	4	
73	Sequential File	6	3	
74	Sub routine	3	2	4
75	System	5	2	2
	Total	293	256	125

TABLE 66

SUMMARY: TERM RECOGNITION
RESPONSE FREQUENCY

Key:
S - Superintendent
A - Assistant Superintendent
x - Familiar
o - Able to Define
z - Unfamiliar

	Item	Response Frequency													
		1		2		3		4		5		6		7		8	
		S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
1	Input			x					x		o					o	
2	Output			x					x		o					o	
3	Central Processor		z	x			o				x					o	
4	Random Access					x	o						x	o			
5	Tape Drive		x	z		z			ox	o							
6	On-Line	z	z	x			x				o			o			
7	Address	z			o	x	x		z			o					
8	Boolean Logic		ox	x		o		z							z		
9	Digital Computer	z					o					o	x				
10	Analog Computer	z	x					x	oz	o							
11	Edit Run					xz	o	o					x				
12	Back-Up System	z				x			o		x	o					
13	Batch Process							o	o	x	x						
14	Unit Record							o	x	ox							
15	BIT				z	ox	o		zx								
16	Call-In			z	z		o	xo	x								
17	Storage Capacity							x	ox			o					

TABLE 66 - Continued

Item	Key: S - Superintendent; A - Assistant Superintendent; x - Familiar; o - Able to Define; z - Unfamiliar. Response Frequency															
	1		2		3		4		5		6		7		8	
	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
18 Pert				o	oz	z	x	x								
19 Channel			o	o		z	xz	x								
20 Check			ox	o							z	z				
21 Cobol				z		x	ox	o								
22 Alpha-Numeric		z					ox	ox								
23 Systems Analysis							x	x		o	o					
24 Mgmt. Info. Systems	z	zx			x						o			o		
25 Application		z		o			x				o	x				
26 Assembler			o	o	z	z		x	x							
27 Binary	z				o			z		o	x					
28 Programmer						o			ox			x				
29 Buffer				o	oz	z	x	x								
30 Bug		z			ox		z	ox								
31 Byte			o			oxz	xz									
32 Card Code		z	z		o	o			x	x						
33 Character			z		x	o			o			x				
34 Real-Time				z	zx	o	o	x								
35 Collate							x	x		o	o					
36 Common Language	z			z		x	o	o	x							
37 Compare					ox	oxz	z									
38 Compiler			z	z	o	x		o	x							

TABLE 66 - Continued

Item	Key: S - Superintendent; A - Assistant Superintendent; x - Familiar; o - Able to Define; z - Unfamiliar															
	Response Frequency															
	1		2		3		4		5		6		7		8	
	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
39 Compatability		z				x	o			o	x					
40 Configuration				z		x	o	o			x					
41 Console				z		x	o	o			x					
42 Cybernetics	z	o	x			z				x			o			
43 Data		z					x	ox			o					
44 Decision	z			x		z	o	o	x							
45 Disk		z				x			ox	o						
46 Erase		z		o	oz		x					x				
47 External Memory				z	ox	x	z	o								
48 Flow Chart								o	ox	x						
49 FORTRAN		z			o			ox					x			
50 Information Retrieval		z	zx			x				o	o					
51 Inquiry			zx			o					o	x				
52 Interface			o				zx	o		z						
53 Language				zx	o					o			x			
54 Library			z			ozx	ox									
55 Location			z	z	o	x		o	x							
56 Loop		x	o		z			zo	z							
57 LPM		o	xo								z					z
58 Matrix		z					o	ox			x					
59 Microseconds	z					o	o		x			x				

TABLE 66 - Continued

Item	Key: S - Superintendent; A - Assistant Superintendent; x - Familiar; o - Able to Define; z - Unfamiliar															
	Response Frequency															
	1		2		3		4		5		6		7		8	
	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
60 Milliseconds	z			o			o		x					x		
61 Nanoseconds		oz	o		z				x					x		
62 Off-Line				z		o		x	ox							
63 Operations Research-OR				oz	oz		x			x						
64 Parameter	z			z		x	o	o	x							
65 Critical Path Method	z	z				o	o		x	x						
66 Program						o			ox			x				
67 Run						o			ox			x				
68 Operating Systems-OS				oz		x				x	o					
69 Mark Sensing							x	x		o	o					
70 Simulation	z	z			x	o				x	o					
71 Software							x	o		x	o					
72 Sort							x	o		x	o					
73 Sequential File			z		o	o			x		x					
74 Sub Routine				o	oz	x	x	x								
75 System				oz					ox	x						

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Presently, the educational administrator is faced directly or indirectly with the effects of two revolutionary phenomena - the population explosion and the influence of technological developments. The effect of the latter in great measure represents the basis for this study.

The expenditure of human and material resources during the decade of the 1960's established Educational Data Processing (EDP) as a potential tool for use by the educational administrator. The activity of the last decade can be viewed, principally, as the introduction of EDP into an educational environment. The initial experiences of administrators with automated systems demonstrated that EDP is not a panacea for their administrative ills. Its value as an administrative tool is directly related to the extent of their involvement and understanding of the processes necessary to make it a viable instrument.

If there is to be emergence of "Educational Data

Processing" as a unique adaptation of a technology to serve the needs of education, a broader and deeper perception of the technology will be required of educators.

Purpose of the Study

Educational Data Processing and its relationship to educational administration is a relatively recent phenomenon.

The basic purpose of this study is to describe how this relationship has fared and to determine whether the educational administrator can advantageously use EDP services without possessing the skills of a technician.

Within this context four questions are investigated.

1. What is the role of the school administrator based upon his experience with electronic data processing during this transitional period?

2. Who determines the nature, priorities and use of information produced by electronic data processing?

3. What has been the evolving pattern of Educational Data Processing within the educational environment of Michigan schools?

4. Has Educational Data Processing become a management tool or a mechanical clerk by perpetuating older manual methods?

Research Design

The sample data base reflected in this descriptive study was drawn from ten selected Michigan school districts.

The ten districts were selected by two individuals familiar with the growth of EDP within the State of Michigan.

The criteria for the selection of the sample districts was:

1. The district must have been involved in more than one application area of EDP.

2. The EDP activity has involved administrators at the level(s) of superintendent, assistant superintendent and EDP director.

Data Collection

The method used to establish a data base for the study was the personal interview using a questionaire. The questionaires were identical and pre-coded to reflect responses appropriate to the administrative level. The questionaire reflects the 1) historical, 2) experience, 3) education, 4) recommendations and 5) implementation aspects of EDP growth and development within the selected Michigan school districts.

Conclusions

The conclusions reached in this study are based upon the investigations of four questions as previously stated in the Purpose of the Study.

Each question is treated individually as it relates to the findings in Chapter III.

Question 1:

> What is the role of the educational administrator based upon his experience with electronic data processing?

Conclusions:

1. Educational administrators are beginning to demonstrate that they are responding to rapidly changing requirements in educational administration.

2. Administrators associated with central staff functions have been the principal leadership source for introducing and implementing automated systems in an educational environment. The degree of acceptance of EDP in the school districts involved in this study can be directly attributable to this core of administrators.

3. In providing the leadership role for the introduction of EDP, administrators have developed a basic perception and knowledge of EDP to build for future EDP activity. Administrators involved in the study were familiar or able to define eighty-three percent of the terms used in the Term Recognition segment of the study.

This basic understanding has fostered a growing use of EDP in meeting administrative needs.

4. Administrators, in their desire to be supportive of efforts to implement automated systems and forestall any radical departure from prevailing practices, established a practice of assigning an educator with interest and/or skills to prepare their constituencies for a transition to automated systems. The rationale for this approach appears to be two-fold: 1.) to expedite the problem of communications between the technician and non-technician, and 2.) to retain control over procedures, systems and services.

   This practice has prevailed since the inception of EDP in the districts involved in the study. It is a practice which seems firmly entrenched based upon the responses of those interviewed.

Question 2:

Who determines the nature of priorities and use of information produced by electronic data processing?

Conclusions:

1. Initially, the nature of priorities related to EDP operations were established by superintendents and/or assistant superintendents. This is reflected in the original reasons for adopting automated systems in meeting growing clerical demands.

2. Presently, due to a growing acceptance of EDP and evidence of increased application development in non-business related areas, an emerging practice of shared responsibility or committee approach to establishing EDP policies and practices is evident.

3. While there is the suggestion of shared responsibility in the management of EDP activities, it would appear that of those administrators interviewed, superintendents and EDP directors seemed to hold a more positive view of their role and influence upon EDP operations, while assistant superintendents appeared to be less involved. One-half of the superintendents in the study perceived themselves in a controlling role; while over a third of the assistants felt their principal relationship with EDP was that of a recipient of services. Based upon these findings, one would conclude that, presently, superintendents and EDP directors establish the nature of priorities and use of EDP produced information.

Question 3:

What has been the evolving pattern of EDP development within the educational environment of Michigan schools?

1. On a state-wide basis, Michigan has suffered from a fragmentary approach to the introduction and implementation of EDP in an educational environment. The leadership and coordination of the State Department of Education has been notably lacking. With the exception of a few exemplary local district programs, the Intermediate Schools

appear to be emerging as the coordinating agent for EDP endeavors.

2. Due to the rapid development of EDP technology during the past decade, the cost of maintaining EDP facilities and programs have risen rapidly. Based upon the sample districts experiences with EDP, expenditures for EDP operations are running from one-half to one and one-half percent of the total school district operating budgets.

3. Despite rising EDP costs, a review of the miscellaneous EDP activity, administrators are supportive of efforts to extend the use of EDP in an educational environment. The nature of the miscellaneous EDP activity in great measure must be classified as Research and Development activities.

4. Administrators, while supportive of EDP activity presently have a minimal understanding of a systems approach which complements and is essential to EDP activity. There is little to suggest that the leadership extended to introduce and implement automated systems is to be found in furthering a systems approach in assisting administrators and staff in defining and meeting educational objectives.

5. The increase in EDP expenditures are not only indicative of the increased cost of maintaining EDP facilities but willingness to recognize improved reporting and reliability of information using EDP methods. The successes have been sufficient to create an attitude that if conditions permitted administrators would expand EDP facilities and/or operations.

6. While one of the perennial concerns of administrators is to live with budgets based upon fixed incomes, administrators involved in the study viewed EDP's value to their operations as being essentially service-oriented.

   Individual opinions vary as to whether dollar savings accrue either in curbing rising personnel needs or operational needs. Collectively, based upon the findings in the EDP utilization segment of the study, there can be no doubt that information availability and reporting, which spans the entire spectrum of the educational organization at one-half to one and one-half percent of the operational budget, is a positive argument for expanding EDP activities.

7. The influence of EDP has yet to be felt in the area for which the educational enterprise exists, meeting the instructional needs of young people. There is evidence to suggest that budding, significant efforts are being initiated to harness the potential of EDP for meeting the educational needs of students. The major obstacles based upon the responses of administrators to future development are: 1) shortage of qualified personnel, 2) technological limitations, 3) lack of understanding and training of existing personnel in adapting EDP to instructional uses, and 4) increasing costs of EDP.

Question 4:

Is Educational Data Processing emerging as a management tool or a mechanical clerk perpetuating old manual methods?

Conclusions:

1. Educational Data Processing reflecting the needs of education, per se, has yet to emerge as a distinctive form of electronic data processing.

2. The adoption of EDP methods has met some of the immediate problems of relieving tedious clerical tasks created by increased demands for record keeping.

3. The most successful adaptation of EDP in an educational environment has been in automating areas related to finance. The successes of these finance-related areas are principally a carry-over from non-education enterprises.

4. Despite greater utilization of EDP in terms of more applications, as the findings in the EDP utilization segment of the study indicate, EDP produced information is treated as distinct segments of data relating to specific activities rather than information bearing upon the total enterprise.

5. There are limitations in present EDP reporting. Administrators felt the need for appropriate reporting reflecting needs at specific administrative levels.

6. Initially, EDP's primary objective was to replace manual clerical tasks. As familiarity with EDP methods and procedures has grown, administrators with the aid of report-

ing appear to be developing the skills of analysis and forecasting as an aid to decision-making. The ability to obtain more comprehensive reporting should enable administrators to develop an aspect of accountability at varying levels of the organizational structure which, heretofore, was not easily obtained.

7. Administrators acknowledged that educational units must assume a greater burden in preparing personnel for utilizing EDP in meeting the needs of education.

8. Education has not experienced the full impact and efficient utilization of EDP. Presently, the efforts of educators must be considered innovative with some aspects of research and development activity associated with its development.

9. Considering the state of the art and degree of general knowledge as compared to actual EDP utilization, it must be concluded that EDP is beginning to emerge as a management tool.

Recommendations

The following recommendations are offered in the belief that technological growth in an educational environment will accelerate rather than diminish.

If education is to be responsive within the environment in which it operates and the administrator's role is to continually examine the indices of what constitutes good

education, administrators will need to become the interface between the emerging technologies, the educational process and the society they are obliged to serve. In essence, the educational administrator should have at his disposal the total body of data related to the educational enterprise bearing upon the educational process. The ability to communicate these processes rest in great measure upon a reliable information system which reflects the total educational endeavor. To implement such a system requires the following considerations.

General

> Education must develop strategies to make possible the emergence of an information system which reflects the needs of education. Education must reorder its priorities relative to the utilization of EDP. People's understanding and acceptance of concepts, procedures and practices must be accelerated if the benefits of the emerging technologies is to benefit those placed in our charge - children. The acceptance of this premise must be accomplished without compromising the premise that education's activity, service and benefits are related to people. Development and progress on further utilization and effectiveness of EDP in an educational environment must not be sacrificed in the process.

Specific

1. The State Department of Education should assume a coordinating role in developing strategies with local and intermediate units affecting common procedures and practices if further fragmentation of EDP practices is to be slowed if not controlled. Local initiative must continue to prevail to reflect individual school district needs.

2. The establishment of programs, support and involvement of university personnel with public school personnel in the development of programs of instruction of both a technical and non-technical orientation to deal with the emerging technology and its relationship to education.

3. One of the present characteristics of the emerging technologies, of which EDP is only one manifestation, is that it is essentially innovative. Educational administrators must support basic research related to these activities at the local, regional and state levels. Personnel and material allocations with longer cycles of planning for implementation of programs must become an accepted pattern of activity in education.

4. Information systems are an end product of man-machine interaction. To promote understanding and better utilization of computer-based information systems by administrators, formalized in-service activity which stresses management information systems concepts must be adopted through state/university/local sponsorship.

5. Research and studies which would aid in the understanding of the impact of automated systems upon existing organizational structures and facilitate the conversion process of EDP procedures and practices is needed.

Appendix A

Historical-Descriptive Data

SD_____ DATA BASE (HISTORICAL) P-1 Card II

C.C.	Code		
			SCHOOL ORGANIZATION
1	1	○	6-3-3
	2	○	5-3-4
	3	○	8-4
	4	○	Other _____
			STUDENT POPULATION
2	1	○	Under 5,000
	2	○	5,000 - 9,000
	3	○	10,000 - 14,000
	4	○	15,000 - 19,000
	5	○	20,000 - 24,000
	6	○	25,000 - 29,000
	7	○	Over 30,000
			PROFESSIONAL STAFF
3	1	○	Under 100
	2	○	100 - 199
	3	○	200 - 299
	4	○	300 - 399
	5	○	400 - 499
	6	○	500 - 599
	7	○	600 - 699
	8	○	700 - 799
	9	○	Over 800
			ADMINISTRATION
4	1	○	0 - 10
	2	○	10 - 19
	3	○	20 - 29
	4	○	30 - 39
	5	○	40 - 49
	6	○	50 - 59
	7	○	60 - 69
	8	○	70 - 79
	9	○	Over 80

SD_____ DATA BASE (HISTORICAL) P-2 Card II

C.C.	Code		
			1968-69 TOTAL OPERATINB BUDGET
5-6	01	○	Under 5 million
	02	○	5 - 6 million
	03	○	6 - 7 million
	04	○	7 - 8 million
	05	○	8 - 9 million
	06	○	9 - 10 million
	07	○	10 - 11 million
	08	○	11 - 12 million
	09	○	12 - 13 million
	10	○	13 - 14 million
	11	○	14 - 15 million
	12	○	Over 15 million
			1968-69 PER PUPIL EXPENDITURES
7-8	01	○	$500 - 549
	02	○	550 - 599
	03	○	600 - 649
	04	○	650 - 699
	05	○	700 - 749
	06	○	750 - 799
	07	○	800 - 849
	08	○	850 - 899
	09	○	900 - 949
	10	○	Over 950
			VOTED MILLAGE 1968-69
9-10	01	○	Under 15
	02	○	15 - 18
	03	○	19 - 20
	04	○	21 - 22
	05	○	23 - 24
	06	○	25 - 26
	07	○	27 - 28
	08	○	29 - 30
	09	○	31 - 32

SD_____ DATA BASE (HISTORICAL) P-3 Card II

C.C. Code

VOTED MILLAGE 1968-69 - Continued

10	○	33 - 34
11	○	35 - 36
12	○	37 - 38
13	○	39 - 40
14	○	Above 40

EDP BUDGET 1968-69*

11-12	01	○	45 - 49 thousand
	02	○	50 - 54 thousand
	03	○	55 - 59 thousand
	04	○	60 - 64 thousand
	05	○	65 - 69 thousand
	06	○	70 - 74 thousand
	07	○	75 - 79 thousand
	08	○	80 - 84 thousand
	09	○	85 - 89 thousand
	10	○	90 - 94 thousand
	11	○	95 - 99 thousand
	12	○	100 - 104 thousand
	13	○	105 - 109 thousand
	14	○	110 - 114 thousand
	15	○	115 - 119 thousand
	16	○	120 - 124 thousand
	17	○	125 - 129 thousand
	18	○	130 - 134 thousand
	19	○	135 - 139 thousand
	20	○	140 - 144 thousand
	21	○	145 - 149 thousand
	22	○	Above 150 thousand

*Includes equipment, staff, supplies, general operation

SD_____ DATE BASE (HISTORICAL) P-4 Card II

C.C.	Code		
			PERCENT OF SCHOOL BUDGET 1968-69
13-14	01	○	.5 - 0.9
	02	○	1.0 - 1.4
	03	○	1.5 - 1.9
	04	○	2.0 - 2.4
	05	○	2.5 - 2.9
	06	○	3.0 - 3.4
	07	○	3.5 - 3.9
	08	○	4.0 - 4.4
	09	○	4.5 - 4.9
	10	○	Over 5.0
			NUMBER OF YEARS IN EDP
15	1	○	Less than 3 years
	2	○	4 years
	3	○	5 years
	4	○	6 years
	5	○	7 years
	6	○	8 years
	7	○	9 years
	8	○	10 years
	9	○	More than 10 years
77-78			School Code
79-80			Card H-I

Appendix B

EDP Utilization

SD_____ EDP UTILIZATION P-1 Card I

C.C.	Code		
1-2	SD		
			BUDGETING AND ACCOUNTING (Check appropriate items)
3	1	○	Request and estimate analysis
4	1	○	Allocation to specific categories
5	1	○	Maintenance of amount available in each category after each transaction affecting that category
6	1	○	Notification when a budget category is not being spent as anticipated
7	1	○	Detail accounting of how the resources in each category were spent
8	1	○	Cost analyses of goods and services, and of educational programs
9	1	○	Projected costs in each budget category of proposed actions
10	1	○	Income versus outgo projections
11	1	○	Financial reports to boards, the state, individual schools, and so forth
			PAYROLL (Check appropriate items)
12	1	○	Preparation of salary checks
13	1	○	Maintenance of school and employee accounts for withholding tax, insurance, retirement and so forth
14	1	○	Preparation of documents for tax, retirement and insurance officials
15	1	○	Preparation of employee withholding tax statements
16	1	○	Salary accounting from various budget categories and to various educational programs

SD_____ EDP UTILIZATION P-2 Card I

C.C.	Code		
			PURCHASING (Check appropriate items)
17	1	○	Accumulation of requisitions for quantity discounts
18	1	○	Encumbrance and release of funds
19	1	○	Product and vendor statistical information
20	1	○	Analysis of disposition of purchased goods and services
21	1	○	Follow-up for uncompleted purchase orders
22	1	○	Purchase accounting from various budget categories, to various educational programs, and to inventory
			SUPPLIES/INVENTORY (Check appropriate items)
23	1	○	Preparation of requisition procedures for stock items
24	1	○	Automatic reordering
25	1	○	Allocation of costs to budget categories and projects
26	1	○	Preparation of delivery schedules and routing
27	1	○	Inventory of materials in use or stocked'
			ACCOUNTS PAYABLE AND RECEIVABLE (Check appropriate items)
28	1	○	Generation of bills
29	1	○	Crediting and debiting of proper accounts
30	1	○	Follow-up for unpaid bills
			MAINTENANCE (Check appropriate items)
31	1	○	Scheduling of preventive maintenance
32	1	○	Repair scheduling and costing
33	1	○	Replacement scheduling
34	1	○	Analysis of product durability

SD_____ EDP UTILIZATION P-3 Card I

C.C.	Code		
			CAFETERIA ACCOUNTING (Check appropriate items)
35	1	○	Analysis of available foods and prices in relation to diet and consumption habits of pupils
36	1	○	Food ordering, inventory and payment
			INSTRUCTIONAL MATERIAL (A-V, Books) (Check appropriate items)
37	1	○	Ordering
38	1	○	Cataloging
39	1	○	Requisitioning
40	1	○	Analysis of actual use by teacher, department, subject and pupil
41	1	○	Analysis of maintenance and cost
			PERSONNEL (Check appropriate items)
42	1	○	Analysis of applicant interview and qualifications
43	1	○	Experience and qualifications of staff members
44	1	○	Job evaluation
45	1	○	Salary information
46	1	○	Academic credits
47	1	○	Leave record, including illness
48	1	○	Studies of geographic origin, education, certification and professional mobility patterns
			PUPIL CENSUS/SURVEY (Check appropriate items)
49	1	○	Enrollment predictions
50	1	○	Attendance law compliance, particularly for pupils in other schools
51	1	○	Source of verified birth date for test and legal purposes

SD_____ EDP UTILIZATION P-4 Card I

C.C.	Code		
			PUPIL CENSUS/SURVEY (Continued)
52	1	O	Address directories for capitation purposes
53	1	O	Federal employment of parents survey
54	1	O	Age in grade reports
55	1	O	Bus transportation planning and control
56	1	O	Mailing of school communications
57	1	O	Pupil directories for all school offices
58	1	O	Preschool surveys
			REGISTRATION AND SCHEDULING (Check appropriate items)
59	1	O	Recording of course requests
60	1	O	Comparison of requests with anticipated instructional program for pupil (and for school if there is a choice of schools).
61	1	O	Check for prerequisites
62	1	O	Summer school courses
63	1	O	Lists of pupils requesting specified courses for screening (advanced placement, band, courses to be withdrawn).
64	1	O	Interaction or potential conflicts analysis
65	1	O	Projection of enrollment in higher level courses based on requests for beginning courses
66	1	O	Construction of the master schedule
67	1	O	Simulation of proposed master schedules for purpose of refinement
68	1	O	Pupil schedules
69	1	O	Class lists
70	1	O	Homeroom lists
71	1	O	Unhonored request lists for counselor action
72	1	O	Room utilization studies
73	1	O	Room characteriestics (for scheduling purposes)
74	1	O	Extracurricular activity time assignment
75	1	O	Locker assignment and lock combination records
79-80	1		Card ID

SD_____ EDP UTILIZATION P-1 Card II

C.C.	Code		
1-2	SD		
			ATTENDANCE ACCOUNTING (Check appropriate items)
3	1	○	Daily attendance bulletin
4	1	○	Period-by-period accounting of pupils not present and not on the daily bulletin
5	1	○	Preparation of register pages for manual recording or optical scanner sheets for machine analysis
6	1	○	Lists of pupils with unusual attendance characteristics
7	1	○	Recording, posting and summarizing: by pupil, by classroom, by school, and by district
			GRADE REPORTING (Check appropriate items)
8	1	○	Printing of report cards
9	1	○	Summary lists for teachers, department heads, counselors
10	1	○	Pupil transcripts
11	1	○	Mark analysis by course and teacher
12	1	○	Comment analysis by course and teacher
13	1	○	Failure, near-failure, and incomplete lists
14	1	○	Computation of various averaging and ranking statistics
15	1	○	Notification of counselors when pupil marks or number and type of comments deviate from expectation
16	1	○	Honor roll and rank in class determination
17	1	○	Underachiever identification
18	1	○	Preparation of anticipated mark distribution for each class from distribution of test ability and school's marking practices for the course

SD_____ EDP UTILIZATION P-2 Card II

C.C.	Code		
			MISCELLANEOUS (Check appropriate items)
19	1	○	Summaries of ability versus achievement
20	1	○	Administrative roles of staff
21	1	○	College admission studies: What kinds of pupils make good where?
22	1	○	Misconduct reports and analyses
23	1	○	School insurance accounting
24	1	○	Physical education skill and achievement records
25	1	○	Health and dental records
26	1	○	Identification of pupils with handicaps or special needs
27	1	○	Population studies
28	1	○	Dropout prediction
29	1	○	Dropout analysis
79-80			Card ID

TABLE 67

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
BUDGETING AND ACCOUNTING

Budgeting and Accounting		Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Maintenance of amount available in each category after each transaction affecting that category	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Financial reports to boards, the state, individual schools, and so forth	x	x	x	x	x	x	x	x	x	x	10	1	100.0
3	Detail accounting of how the resources in each category were spent	x	x	x	x	x		x	x	x	x	9	2	90.0
4	Allocation to specific category	x	x			x	x	x	x	x	x	8	3	80.0
5	Notification when a budget category is not being spent as anticipated	x		x	x		x	x	x		x	7	4	70.0
6	Projected costs in each budget category of proposed actions			x			x	x	x	x	x	6	5	60.0
7	Income versus outgo projections	x		x			x	x		x	x	6	5	60.0
8	Request and estimate analysis	x							x	x	x	4	6	40.0
9	Cost analyses of goods and services and of educational programs					x			x			2	7	20.0
	Total Applications by Districts	7	4	6	4	6	6	7	8	7	8	63		
	Application by District - Percent	77.8	44.4	66.7	44.4	66.7	66.7	77.8	88.9	77.8	88.9	70.0		

TABLE 68

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
PAYROLL

Payroll		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.	Application	Districts 1	2	3	4	5	6	7	8	9	10	DU	RO	Percent IU
1	Preparation of salary checks	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Maintenance of school and employee accounts for withholding tax, insurance, retirement, and so forth	x	x	x	x	x	x	x	x	x	x	10	1	100.0
3	Preparation of documents for tax, retirement and insurance officials	x	x	x	x	x	x	x	x	x	x	10	1	100.0
4	Preparation of employee withholding tax statements	x	x	x	x	x	x	x	x	x	x	10	1	100.0
5	Salary accounting from various budget categories and to various educational programs	x	x	x	x	x	x	x	x	x	x	10	1	100.0
	Total Applications by Districts	5	5	5	5	5	5	5	5	5	5	50		
	Application by District - Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		

TABLE 69

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
PURCHASING

Purchasing		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.	Application	Districts 1	2	3	4	5	6	7	8	9	10	DU	RO	Percent IU
1	Encumbrance and release of funds	x	x		x	x	x	x	x	x	x	9	1	90.0
2	Follow-up for uncompleted purchase orders	x		x		x	x	x	x	x	x	8	2	80.0
3	Product and vendor statistical information	x		x	x		x	x	x		x	7	3	70.0
4	Purchase accounting from various budget categories, to various educational programs, and to inventory		x				x	x		x	x	5	4	50.0
5	Accumulation of requisitions for quantity discounts			x	x			x		x		4	5	40.0
6	Analysis of disposition of purchased goods and services						x	x		x	x	4	5	40.0
	Total Application by Districts	3	2	3	3	2	5	6	3	5	5	37		
	Application by District - Percent	50.0	33.3	50.0	50.0	33.3	83.3	100.0	50.0	83.3	83.3	61.7		

TABLE 70

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
SUPPLIES/INVENTORY

	Supplies/Inventory	Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Allocation of costs to budget categories and projects		x				x	x	x	x		5	1	50.0
2	Preparation of requisition procedures for stock items				x				x			2	2	20.0
3	Inventory of materials in use or stocked				x				x			2	2	20.0
4	Automatic Reordering				x							1	3	10.0
5	Preparation of delivery schedule and routing													
	Total Applications by Districts	0	1	0	4	0	1	1	3	1	0	11		
	Application by District - Percent		20.0		80.0		20.0	20.0	60.0	20.0		22.0		

TABLE 71

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
ACCOUNTS PAYABLE AND RECEIVABLE

Accounts Payable and Receivable		Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Crediting and debiting of proper accounts	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Follow-up for unpaid bills	x		x		x				x	x	5	2	50.0
3	Generation of bills	x		x	x		x					4	3	40.0
	Total Applications by Districts	3	1	3	2	2	2	1	1	2	2	19		
	Application by District - Percent	100.0	33.3	100.0	66.7	66.7	66.7	33.3	33.3	66.7	66.7	63.3		

TABLE 72

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
MAINTENANCE

Item No.	Maintenance	Districts 1	2	3	4	5	6	7	8	9	10	DU	Percent RO	Percent IU
1	Scheduling of preventive maintenance													
2	Repair scheduling and costing													
3	Replacement scheduling													
4	Analysis of product durability													
	Total Applications by Districts	0	0	0	0	0	0	0	0	0	0	0		
	Application by District - Percent	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0		

Key:
DU - District Utilization-All Districts
RO - Rank Order
IU - Item Utilization Percentage

TABLE 73

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
CAFETERIA ACCOUNTING

Cafeteria Accounting		Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Food ordering, inventory and payment			x			x	x			x	4	1	40.0
2	Analysis of available foods and prices in relation to diet and consumption habits of pupils	x										1	2	10.0
	Total Applications by Districts	1	0	1	0	0	1	1	0	0	1	5		
	Application by District - Percent	50.0		50.0			50.0	50.0			50.0	25.0		

TABLE 74

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
INSTRUCTIONAL MATERIAL (A-V, BOOKS)

INSTRUCTIONAL MATERIAL (A-V, BOOKS)		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Ordering			x	x	x		x	x		x	6	1	60.0
2	Cataloging				x	x					x	3	2	30.0
3	Requisitioning			x	x				x			3	2	30.0
4	Analysis of actual use by teacher, department, subject and pupil				x							1	3	10.0
5	Analysis of maintenance and cost											0	4	00.0
	Total Applications by Districts			2	4	2		1	2		2	13		
	Application by District - Percent			40.0	80.0	40.0		20.0	40.0		40.0	26.0		

TABLE 75

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
PERSONNEL

Personnel		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.	Application	Districts											Percent	
		1	2	3	4	5	6	7	8	9	10	DU	RO	IU
1	Salary information	x	x	x	x		x	x	x	x	x	9	1	90.0
2	Leave record, including illness	x	x	x	x		x	x	x	x	x	9	1	90.0
3	Experience and qualifications of staff members			x	x		x	x	x	x		6	2	60.0
4	Academic credits			x	x				x	x	x	5	3	40.0
5	Studies of geographic origin, education, certification and professional mobility patterns							x	x			2	4	20.0
6	Analysis of applicant interview and qualifications												5	00.0
7	Job evaluation												5	00.0
	Total Applications by Districts	2	2	4	4	0	3	4	5	4	3	31		
	Applications by District - Percent	28.6	28.6	57.1	57.1		42.9	57.1	71.4	57.1	42.9	44.3		

TABLE 76

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
PUPIL CENSUS-SURVEY

PUPIL CENSUS/SURVEY		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.		Districts												Percent
		1	2	3	4	5	6	7	8	9	10	DU	RO	IU
1	Mailing of school communications	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Pupil directories for all school offices	x	x	x	x	x	x	x	x	x	x	10	1	100.0
3	Age in grade reports	x	x	x	x	x	x		x	x	x	9	2	90.0
4	Enrollment predictions	x	x	x	x		x	x		x	x	8	3	80.0
5	Source of verified birth date for test and legal purposes		x	x	x	x	x	x		x	x	8	3	80.0
6	Address directories for capitation purposes	x	x	x		x	x	x		x	x	8	3	80.0
7	Preschool surveys		x	x	x	x		x	x	x	x	8	3	80.0
8	Attendance law compliance, particularly for pupils in other schools		x	x	x	x	x	x		x	x	7	4	70.0
9	Bus transportation planning and control				x	x	x		x	x		5	5	50.0
10	Federal employment of parents survey						x				x	2	6	20.0
	Total Applications by Districts	5	8	8	8	8	9	6	5	9	9	75		
	Application by District - Percent	50.0	80.0	80.0	80.0	80.0	90.0	60.0	50.0	90.0	90.0	75.0		

TABLE 77

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
REGISTRATION AND SCHEDULING

Registration and Scheduling		Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Recording of course requests	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Comparison of requests with anticipated instructional program for pupil (and/or school if there is a choice of schools)	x	x	x	x	x	x	x	x	x	x	10	1	100.0
3	Simulation of proposed master for purpose of refinement	x	x	x	x	x	x	x	x	x	x	10	1	100.0
4	Pupil schedules	x	x	x	x	x	x	x	x	x	x	10	1	100.0
5	Class Lists	x	x	x	x	x	x	x	x	x	x	10	1	100.0
6	Homeroom lists	x	x	x	x	x	x	x	x	x	x	10	1	100.0
7	Interaction or potential conflict analysis	x	x		x	x	x	x	x	x	x	9	2	90.0
8	Unhonored request lists for counselor action	x		x		x	x	x	x	x	x	8	3	80.0
9	Construction of the master schedule	x			x	x	x	x	x	x		7	4	70.0
10	Lists of pupils requesting specified courses for screening (advanced placement, band, courses to be withdrawn)			x	x		x	x	x	x		6	5	60.0

TABLE 77 - Continued

Item No.	Registration and Scheduling	Districts 1	2	3	4	5	6	7	8	9	10	DU	Percent RO	Percent IU
	Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage													
11	Summer school courses			x	x				x	x	x	5	6	50.0
12	Projection of enrollment in higher level courses based on request for beginning courses	x			x		x	x				4	7	40.0
13	Locker assignment and lock combination records				x				x	x	x	4	7	40.0
14	Check for prerequisites	x								x		2	8	20.0
15	Room utilization studies				x						x	2	8	20.0
16	Room characteristics (for scheduling purposes)									x	x	2	8	20.0
17	Extracurricular activity time assignment				x						x	2	8	20.0
	Total Applications by Districts	11	7	9	14	9	11	11	12	14	13	111		
	Application by District - Percent	64.7	41.2	52.9	82.4	52.9	64.7	64.7	70.6	82.4	76.5	65.2		

TABLE 78

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
ATTENDANCE ACCOUNTING

Attendance Accounting		Key: DU - District Utilization-All Districts; RO - Rank Order; IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Daily attendance bulletin	x		x	x		x	x	x	x	x	8	1	80.0
2	Recording, posting and summarizing: by pupil, by classroom, by school, and by district	x	x	x	x	x	x				x	7	2	70.0
3	Preparation of register pages for manual recording or optical scanner sheets for machine analysis	x		x			x		x	x	x	6	3	60.0
4	Lists of pupils with unusual attendance characteristics	x		x		x	x				x	5	4	50.0
5	Period-by-period accounting of pupils not present and not on the daily bulletin	x			x		x				x	4	5	40.0
	Total Applications by Districts	5	1	4	3	2	5	1	2	2	5	30		
	Application by District - Percent	100.0	20.0	80.0	60.0	40.0	100.0	20.0	40.0	40.0	100.0	60.0		

TABLE 79

EDP UTILIZATION - SUMMARY WITHIN CATEGORY
GRADE REPORTING

Grade Reporting

Key:
DU - District Utilization-All Districts
RO - Rank Order
IU - Item Utilization Percentage

Item No.	Application	Districts										DU	RO	Percent IU
		1	2	3	4	5	6	7	8	9	10			
1	Printing of report cards	x	x	x	x	x	x	x	x	x	x	10	1	100.0
2	Summary lists for teachers, department heads, counselors	x		x	x	x	x	x	x	x	x	9	2	90.0
3	Mark analysis by course and teacher	x	x	x	x	x	x	x		x	x	9	2	90.0
4	Failure, near-failure and incomplete lists	x		x	x	x	x	x	x	x	x	9	2	90.0
5	Computation of various averaging and ranking statistics	x	x	x	x	x		x	x	x	x	9	2	90.0
6	Honor roll and rank in class determination	x	x	x		x		x	x	x	x	8	3	80.0
7	Pupil transcripts			x		x	x			x	x	5	4	50.0
8	Underachiever identification	x			x					x	x	4	5	40.0
9	Comment analysis by course and teacher												6	00.0

TABLE 79 - Continued

Grade Reporting		Key: DU - District Utilization-All Districts RO - Rank Order IU - Item Utilization Percentage												
Item No.	Application	Districts										DU	Percent RO	
		1	2	3	4	5	6	7	8	9	10			
10	Preparation of anticipated mark distribution of each class from distribution of tested ability and school's marking practices for the course												6	00.0
	Total Applications by Districts	7	4	7	6	7	5	6	5	8	8	63		
	Application by District - Percent	63.6	36.4	63.6	54.5	63.6	45.5	54.5	45.5	72.7	72.7	57.3		

Appendix C

Interview Questionaire

INTERVIEW ITEMS

Appropriate Respondent Code:
A - Administrator
E. - EDP Director

Data Base Response:
H - Historical
X - Experience
E - Education
R - Recommendation
I - Implementation

Code			Code
A - E	1.	Length of time in present position	H
A - E	2.	Position when EDP was introduced	H
A - E	3.	Initiative for EDP	H I
A - E	4.	Original Reason	H I
A - E	5.	Unfavorable Reaction	H
A - E	6.	From Whom?	H
A - E	7.	Basis for Unfavorable Reaction	H
A - E	8.	Feasibility Study?	H I
A - E	9.	Participation in Study	H I
A - E	10.	Recommendation for EDP	H I
A - E	11.	Assistance	H I
A - E	12.	Use of Systems Analyst and/or Engineer	R I
A - E	13.	Advise Use of Systems Analyst or Engineer	R I
A - E	14.	Relationship to EDP	H
A - E	15.	Ideally - Relationship	R
A - E	16.	Establishing EDP Policy-Priorities	H R I
A	17.	Communications Problem?	H I
A	18.	Where-Why	X R
A	19.	Are Print-Out Reports Meaningful?	X
A	20.	Information Utilization	X
A	21.	Reliability?	X
A	22.	Current?	X
A - E	23.	EDP Training	H E I
A - E	24.	Source of Training	H E I
A - E	25.	Necessity of Training	R
A - E	26.	Extent of Training	H E I
A	27.	Educator vs EDP Specialist	R E
A	28.	Choice	R E
A - E	29.	Responsibility for Training	R E
A	30.	Change in Decision Making	X
A	31.	Limits-Expands Translating Needs	X
A - E	32	Administrative Style	X

Code		Interview Items	Code
A - E	33.	Future Training	E R
A - E	34.	Future Training - How?	E R
A - E	35.	Admin. Training - Transition	R E
A	36.	Transition to EDP	H X
A - E	37.	Team Approach?	X
A - E	38.	Promote Team Concept	X H
A	39.	Expand EDP	R
A - E	40.	Speed of Transition	X I
A - E	41.	Approach - Today	R I
A - E	42.	Approach - How?	R I
A - E	43.	Basis for Decision	X R
A - E	44.	Still Exist?	X
A - E	45.	Personnel Replacement	H
A - E	46.	Equipment - Own, Lease	H
A - E	47.	Cost Justification	X H
A - E	48.	EDP Services - Demand	X
A - E	49.	EDP Growth - How?	H X
A - E	50.	Chief Concern	H X

INTERVIEW DATA

Response Key:
A = Superintendent - Assistant Superintendent
E = EDP Director

SD_____ P-1 Card I

Response	Item	C.C.	Code		
		1-2	SD		
AE	1				HOW LONG HAVE YOU BEEN IN YOUR PRESENT POSITION? (Check one)
		3	1	○	Less than two years
			2	○	2 - 4 years
			3	○	4 - 6 years
			4	○	6 - 8 years
			5	○	8 -10 years
			6	○	Over 10 years
AE	2				WERE YOU THE SUPERINTENDENT ___ WHEN ASST. SUPT. ___ EDP DIRECTOR ___ EDP WAS INTRODUCTED? (Check one)
		4	1	○	Yes
			2	○	No
AE	3				WHERE DID THE INITIATIVE FOR EDP ARISE IN YOUR DISTRICT? (Check one)
		5	1	○	Superintendent Initiated
			2	○	Board of Education
			3	○	Central Staff Administrators
			4	○	Principals
			5	○	Faculty
			6	○	Other_____

SD_____ INTERVIEW DATA P-2 Card I

		C.C.	Code	
AE	4			WHAT WERE THE ORIGINAL REASON(S) FOR ADOPTING EDP METHODS? (Check appropriate items)
		6	1 ○	Accounting/Budgeting
		7	1 ○	Payroll
		8	1 ○	Purchasing
		9	1 ○	Supplies/Inventory
		10	1 ○	Accounts Payable/Receivables
		11	1 ○	Maintenance
		12	1 ○	Cafeteria Accounting
		13	1 ○	Instructional Materials Record
		14	1 ○	Personnel
		15	1 ○	Pupil Census-Surveys
		16	1 ○	Registration/Scheduling
		17	1 ○	Attendance Accounting
		18	1 ○	Grade Reporting
		19	1 ○	Status of Innovation
		20	1 ○	Other_____
AE	5			WAS THERE AN UNFAVORABLE REACTION TO EDP? (Check one)
		21	1 ○	Yes
			2 ○	No
AE	6			FROM WHOM? (Check appropriate items)
		22	1 ○	Board of Education
		23	1 ○	Faculty
		24	1 ○	Central Office Staff
		25	1 ○	Public
		26	1 ○	Student Body
		27	1 ○	Other_____

SD_____ INTERVIEW DATA P-3 Card I

		C.C.	Code		
AE	7				WHAT WAS THE BASIS FOR THE UNFAVORABLE REACTION? (Check appropriate items)
		28	1	O	Budgetary Consideration
					Fear Due:
		29	1	O	Newness of EDP
		30	1	O	Job Security
		31	1	O	Considered a Frill
		32	1	O	De-humanizing Quality
		33	1	O	Change in Established Routines
		34	1	O	None of these
		35	1	O	Other_____
AE	8				ONCE THE DECISION WAS MADE - WAS A FEASIBILITY STUDY MADE? (Check one)
		36	1	O	Yes
			2	O	No
AE	9				WHO PARTICIPATED IN STUDY? (Check appropriate items)
		37	1	O	Central Staff
		38	1	O	Vendor
		39	1	O	Administration (i.e., principals, department heads, etc.)
		40	1	O	Teachers
		41	1	O	Consultant
		42	1	O	Other_____
AE	10				WHO MADE THE RECOMMENDATION FOR DECISION? (Check one)
		43	1	O	Superintendent
			1	O	Assistant Superintendent
			1	O	Consultant
			1	O	Board of Education or Board Member
			1	O	Other_____

SD_____ INTERVIEW DATA P-4 Card I

		C.C.	Code		
AE	11				DID YOU RECEIVE ASSISTANCE FROM: (Check appropriate items)
		44	1	○	State Dept. of Education
		45	1	○	Universities/Colleges
		46	1	○	Intermediate School District
		47	1	○	Other_____
AE	12				DID YOU USE A SYSTEM ANALYST OR ENGINEER? (Check one)
		48	1	○	Yes
			2	○	No
AE	13				WOULD YOU - NOW - ADVISE USING A SYSTEMS ANALYST OR ENGINEER? (Check one)
		49	1	○	Yes
			2	○	No
AE	14				HOW DO YOU ESSENTIALLY VIEW YOUR ROLL AS ___ SUPERINTENDENT IN RELATION ___ ASST. SUPT. ___ EDP DIRECTOR TO EDP? (Check appropriate items)
		50	1	○	Controlling Influence
		51	1	○	Participant
		52	1	○	Advisory
		53	1	○	Recipient of Services

SD_____ INTERVIEW DATA P-5 Card I

		C.C.	Code	
AE	15			IDEALLY - TO WHOM SHOULD THE DIRECTOR REPORT? (Check one)
		54	1 ○	Superintendent
			2 ○	Deputy Superintendent
			3 ○	Associate Superintendent
			4 ○	Assistant Superintendent-Finance
			5 ○	Other_____
AE	16			WHO ESTABLISHES EDP POLICY AND/OR PRIORITIES? (Check one)
		55	1 ○	Superintendent
			2 ○	Deputy-Associate-Assistant Superintendent
			3 ○	EDP Director
			4 ○	EDP Committee
			5 ○	Other_____
A	17			CONSIDERING THE "STATE OF THE ART" AND THE ABSENCE OF FORMALLY TRAINED EDUCATORS IN EDP - HAS THERE BEEN A COMMUNICATIONS PROBLEM BETWEEN NEEDS AS YOU "SEE THEM" (INPUT) AND OUTPUT FROM EDP? (Check one)
		56	1 ○	Yes
			2 ○	No
A	18			IF ANSWER IS NO - WHERE DOES THE COMMUNICATIONS GAP LIE? (Check appropriate items)
		57	1 ○	Lack of Technical Knowledge
		58	1 ○	Unfamiliarity with Terminology
		59	1 ○	Other_____

SD_____ INTERVIEW DATA P-6 Card I

		C.C	Code	
A	19			DO YOU FIND REPORT PRINT-OUTS FROM EDP MEANINGFUL? (Check one)
		60	1 ○	Yes
			2 ○	No
A	20			HOW IS INFORMATION UTILIZED? (Check appropriate items)
		61	1 ○	For Analysis
		62	1 ○	For Forecasting
		63	1 ○	Basis for Action
		64	1 ○	None of These
		65	1 ○	Other_____
A	21			DO YOU FIND THE INFORMATION RELIABLE? (Check one)
		66	1 ○	Yes
			2 ○	No
A	22			IS IT CURRENT (Check one)
		67	1 ○	Yes
			2 ○	No
AE	23			HAVE YOU RECEIVED ANY EDP TRAINING? (Check one)
		68	1 ○	Yes
			2 ○	No

SD_____ INTERVIEW DATA P-7 Card I

		C.C.	Code		
AE	24				WHERE/HOW DID YOU RECEIVE TRAINING? (Check appropriate items)
		69	1	○	Vendor-sponsored Program
			2	○	School In-Service Program
			3	○	College-University Training
			4	○	Self Taught
			5	○	Have not training
			6	○	Other_____
AE	25				IS IT NECESSARY OR ADVISABLE (Check one)
		70	1	○	Necessary
			2	○	Advsiable
AE	26				TO WHAT EXTENT? (Check appropriate items)
		71	1	○	Hand-on Knowledge of Equipment
		72	1	○	Understand Basic Principles of Computer Logic
		73	1	○	Understand Basic Principles of Systems Analysis
		74	1	○	All of these
		75	1	○	None of these
		76	1	○	Other_____
A	27				IS YOUR DIRECTOR OF EDP AN EDUCATOR OR AN EDP SPECIALIST? (Check one)
		77	1	○	Educator
			2	○	EDP Specialist
		78			Administrative Level
		79-80			Card ID

SD_____ INTERVIEW DATA P-1 Card II

		C.C. 1-2	Code SD		
A	28				IDEALLY, THEY SHOULD BE BOTH. BASED ON YOUR EXPERIENCE TO DATE, WOULD AN EDP TRAINED SPECIALIST HAVE EFFECTED A FASTER CONVERSION TO EDP? (Check one)
		3	1	○	Yes
			2	○	No
AE	29				WHOSE RESPONSIBILITY SHOULD IT BE TO BECOME TRAINED IN EDP METHODS? (Check appropriate items)
		4	1	○	Individual
			2	○	School District
			3	○	Vendor
			4	○	Other_____
A	30				DO YOU SEE EDP AS CHANGING YOUR TRADITIONAL METHOD AT ARRIVING AT DECISIONS? (Check one)
		5	1	○	Yes
			2	○	No
A	31				HAS EDP LIMITED OR EXPANDED YOUR ABILITY TO TRANSLATE THE SCHOOL DISTRICTS NEEDS TO COMMUNITY AND STAFF? (Check one)
		6	1	○	Limited
			2	○	Expanded
			3	○	No Change

SD_____ INTERVIEW DATA P-2 Card II

		C.C.	Code	
AE	32			HAS IT AFFECTED YOUR STYLE OF ADMINISTRATION? (Check one)
		7	1 ○	Yes
			2 ○	No
AE	33			DO YOU SEE THE TRAINING OF FUTURE ADMINISTRATORS CHANGING AS A RESULT OF THE INFLUENCE OF EDP? (Check one)
		8	1 ○	Yes
			2 ○	No
AE	34			HOW? (Check appropriate items)
		9	1 ○	Content of Curriculum
		10	1 ○	More In-Service
		11	1 ○	District-Sponsored Training
		12	1 ○	Other_____
AE	35			HOW BEST CAN THE TRANSITION BE MADE IN THE TRAINING OF ADMINISTRATORS UNTIL SUFFICIENT PROGRAMS ARE AVAILABLE? (Check appropriate items)
		13	1 ○	Individual Responsibility
		14	1 ○	University-College Programs
		15	1 ○	Local District Assistance
		16	1 ○	Create New Positions to Interface with EDP Responsibility
A	36			IN CONVERTING TO EDP, WAS CONVERSION MADE WITHOUT SERIOUSLY DISRUPTING ESTABLISHED NORMAL ROUTINES? (Check one)
		17	1 ○	Yes
			2 ○	No

SD_____ INTERVIEW DATA P-3 Card II

		C.C.	Code		
AE	37				HAS EDP PROMOTED A TEAM APPROACH IN THE DECISION MAKING PROCESS? (Check one)
		18	1	○	Yes
			2	○	No
AE	38				DOES IT PROMOTE THE TEAM CONCEPT MORE OR LESS? (Check one)
		19	1	○	More
			2	○	Less
			3	○	No Change
A	39				BASED UPON YOUR EXPERIENCES TO DATE, WOULD YOU BE INCLINED TO EXPAND EDP ACTIVITY? (Check one)
		20	1	○	Yes
			2	○	No
AE	40				INITIALLY, DO YOU FEEL THAT EDP WENT TOO FAR TOO FAST? (Check one)
		21	1	○	Yes
			2	○	No
AE	41				WOULD YOU APPROACH A CONVERSION DIFFERENTLY - TODAY? (Check one)
		22	1	○	Yes
			2	○	No

SD_____ INTERVIEW DATA P-4 Card II

		C.C.	Code		
AE	42				HOW? (Check one)
		23	1	○	Limit Number of Applications
			2	○	More Applications
			3	○	Approach the same way
AE	43				WOULD YOUR PRESENT KNOWLEDGE BE THE FACTOR IN YOUR DECISION OR GENERAL DISCONTENT WITH EDP? (Check one)
		24	1	○	Present knowledge
			2	○	Discontent with EDP
AE	44				IF GENERAL DISCONTENT IS YOUR ANSWER, DOES THE DISCONTENT STILL EXIST? (Check one)
		25	1	○	Yes
			2	○	No
AE	45				CONSIDERING YOUR DISTRICT'S GROWTH FACTOR, HAS EDP REPLACED EITHER EXISTING OR ANTICIPATED PERSONNEL GROWTH? (Check one)
		26	1	○	Existing
			2	○	Anticipated
AE	46				DO YOU OWN OR LEASE YOUR EDP EQUIPMENT (Check one)
		27	1	○	Own
			2	○	Lease

SD_____ INTERVIEW DATA P-5 Card II

		C.C.	Code		
AE	47				IS COST JUSTIFIED IN TERMS OF: (Check appropriate items)
		28	1	○	Savings
			2	○	Service
			3	○	Accruracy of Information
			4	○	Time-saving
			5	○	Other_____
AE	48				HAS DEMAND GROWN FOR EDP SERVICES? (Check one)
		29	1	○	Yes
			2	○	No
AE	49				HOW DID IT GROW? (Check appropriate items)
		30	1	○	Administration Imposed
		31	1	○	Staff Demand
		32	1	○	Needs to Justify Equipment Expenditures
		33	1	○	Other_____
AE	50				WHAT IS YOUR CHIEF CONCERN REGARDING EDP? (Check appropriate items)
		34	1	○	Increasing Costs
		35	1	○	Constant Equipment Changes
		36	1	○	Shortage of Qualified Personnel
		37	1	○	Other_____
		78	1	○	Superintendent
			2	○	Assistant Superintendent
			3	○	EDP Director
		79-80			Card ID

Appendix D

Term Recognition

TERM RECOGNITION

The non-technical education administrator is not in a position to keep abreast of the rapidly changing vocabulary - terminology - development in EDP.

Administration/Management does have a responsibility to be familiar with basic concepts and vocabulary/terminology.

THE FOLLOWING IS A GLOSSARY OF TERMS BASIC TO EDP.

Please indicate (X) in the appropriate column whether you would be 1) Familiar, 2) Able to Define, 3) Unfamiliar with the terms.

Card #1	Superintendent	G-1	(Card ID)
2	Ass't Superintendent	G-2	
3	EDP Director	G-3	SD_____

C.C.	Code	1 Familiar	2 Able to Define	3 Unfamiliar
1	Input			
2	Output			
3	Central Processor			
4	Ramdom Access			
5	Tape Drive			
6	On-Line			
7	Address			
8	Boolean Logic			
9	Digital Computer			
10	Analog Computer			
11	Edit Run			
12	Back-Up System			
13	Batch Process			
14	Unit Record			
15	Bit			
16	Call-In			

TERM RECOGNITION (Continued)

C.C.	Code	1	2	3
17	Storage Capacity			
18	Pert			
19	Channel			
20	Check			
21	Cobol			
22	Alpha-Numeric			
23	Systems Analysis			
24	Mgmt. Info. Systems			
25	Application			
26	Assembler			
27	Binary			
28	Programmer			
29	Buffer			
30	Bug			
31	Byte			
32	Card Code			
33	Character			
34	Real-Time			
35	Collate			
36	Common Language			
37	Compare			
38	Compiler			
39	Compatibility			
40	Configuration			
41	Console			
42	Cybernetics			
43	Data			
44	Decision			
45	Disk			
46	Erase			
47	External Memory			
48	Flow Chart			
49	Fortran			
50	Info. Retrieval			
51	Inquiry			
52	Interface			
53	Language			
54	Library			
55	Location			

TERM RECOGNITION (Continued)

C.C.	Code	1	2	3
56	Loop			
57	LPM			
58	Matrix			
59	Microseconds			
60	Milliseconds			
61	Nanoseconds			
62	Off-Line			
63	Operations Research-O/R			
64	Parameter			
65	Critical Path Method			
66	Program			
67	Run			
68	Operating Systems-O/S			
69	Mark Sensing			
70	Simulation			
71	Software			
72	Sort			
73	Sequential File			
74	Sub routine			
75	System			

TABLE 80

SUPERINTENDENT'S RESPONSES

Key:
F - Familiar
AD - Able to Define
U - Unfamiliar

No. of Responses	F	Total	Percent	AD	Total	Percent	U	Total	Percent
1			0.0	0	0	0.0	16	16	14.2
2	11	22	7.3	8	16	4.8	10	20	17.7
3	13	39	12.9	17	51	15.4	11	33	29.2
4	22	88	29.0	17	68	20.6	8	32	28.3
5	22	110	36.3	11	55	16.6			0.0
6	5	30	9.9	16	96	29.0	2	12	10.6
7	2	14	4.6	3	21	6.3			0.0
8			0.0	3	24	7.3			0.0
Totals	75	303	100.0	75	331	100.0	48	113	100.0

Total Response 747

TABLE 81

ASSISTANT SUPERINTENDENT'S RESPONSES

Key:
F - Familiar
AD - Able to Define
U - Unfamiliar

No. of Responses	F	Total	Percent	AD	Total	Percent	U	Total	Percent
1	3	3	1.0	4	4	1.6	19	19	15.2
2	2	4	1.4	13	26	10.2	16	32	25.6
3	17	51	17.3	21	63	24.6	9	27	21.6
4	21	84	28.7	24	96	37.5	5	20	16.0
5	13	65	22.2	12	60	23.4	1	5	4.0
6	12	72	24.6			0.0			0.0
7	2	14	4.8	1	7	2.7	2	14	11.2
8			0.0			0.0	1	8	6.4
Totals	70	293	100.0	75	256	100.0	53	125	100.0

Total Response 674

TABLE 82

SUPERINTENDENT'S COMBINED RESPONSES

Summary	Key: TCR - Total Category Response TSR - Total Summary Response		
	TCR	TSR	Percent
Familiar	303	747	40.6
Able to Define	331		44.3
Unfamiliar	113		15.1
Total	747	747	100.0

TABLE 83

ASSISTANT SUPERINTENDENT'S COMBINED RESPONSES

Summary	Key: TCR - Total Category Response TSR - Total Summary Response		
	TCR	TSR	Percent
Familiar	293	674	43.5
Able to Define	256		38.0
Unfamiliar	125		18.5
Total	674	674	100.0

SELECTED BIBLIOGRAPHY

Books and Pamphlets

American Association of School Administrators. EDP and the School Administrator, Washington, D.C.: American Association of School Administrators, 1967.

Best, John, W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1959.

Counts, George, S. Education and American Civilization. New York: Bureau of Publications, Columbia University, 1952.

Diebold, John. Beyond Automation. New York: McGraw-Hill Book Company Inc., 1964.

Drucker, Peter, F. The Effective Executive. New York: Harper and Row, Publishers, 1967.

Garrity, John, T. Getting The Most Out of Your Computer. New York: McKinsey and Company, 1963.

General Learnings Corporation. A Feasibility Study of a Central Computer Facility for an Educational System, A Final Report. Washington, D.C.: U. S. Department of Health, Education and Welfare, 1968.

Goodlad, John, I., and others. Computers and Information Systems in Education. New York: Brace and World, Inc., 1966.

Goodlad, J. I., and others. Applications of Electronics Data Processing Methods in Education. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1965.

Knezevich, Stephen, J., ed. Administrative Technology and the School Executive. Washington, D.C.: American Association of School Administrators, 1969.

Martino, R. L. Information Systems and Management. Detroit: American Data Processing Institute, 1968.

Michigan Department of Education. Data Processing Equipment Status Report. Lansing: Michigan Department of Education, 1969.

Miller, James. "Top Level Information Flow." Computers and Education. R. W. Gerard. New York: Harcourt, Brace and World Inc., 1966.

Miller, Van. "The Superintendent of Schools." Preparation Programs for School Administrators. East Lansing, Michigan: Michigan State University, 1963.

Sackman, Harold, S. Computer Systems Science and Evolving Society. New York: John Wiley and Sons, 1967.

Sippl, Charles J. Computer Dictionary. New York: The Bobbs-Merrill Company, Inc., 1966.

Articles and Periodicals

Anderson, G. Ernest, Jr. "100 Uses for School Data Processing." The Nation's Schools, 78, (October 1966).

Dearden, John. "The Myth of Real Time Management." Harvard Business Review, (March-April, 1964), 12.

_____. Educational Policies Commission. "The Central Purpose of American Education." The National Education Journal, L (September 1961), p. 13.

_____. "ESEA Title III Projects Involving Use of Data Processing Systems." AEDS Monitor VI (December, 1967), 12.

Hearle, Edward, F. R. "Computers in Public Administration." Public Administration Review, XXVIII (November/December, 1968), 487.

Issacs, Herbert, H. "Computer Systems Technology: Progress, Projections, Problems." Public Administration Review, XXVIII (November/December, 1968), 468.

Kraemer, Kenneth, L. "Urban D.P." Datamation, XIII (August, 1967), 68.

Kraemer, Kenneth, L. "The Evolution of Information Systems for Urban Administration." Public Administration Review, XXIX (July/August, 1969), 389.

Laver, Murray. "User's Influence on Computer Systems Design." Datamation, October, 1969, 107.

_____. "Machine Accounting and Related Services for School Administrators." The Nation's Schools, May, 1968, 65-84.

Raferty, C. R. "Management Cannot Use A Parochial Viewpoint," 67 (January, 1968), 75.

Ream, Norman, J. "The Computer and Its Impact on Public Organization." Public Administration Review, XXVIII (November/December, 1968), 501.

_____. "The Challenge of Automation" Newsweek, January 25, 1965.

Wilkins, Leslie, T. "Computer Impact on Public Decision Making." Public Administration Review, XXVIII (November/December, 1968), 504.

Unpublished Material

U. S. Office of Health, Education and Welfare. Washington, D.C., 1967.

"Individualized Communications Systems." Project No. OE 67-4301 - Indicom, 1967.

"Integrated Educational Information Systems." Project No. 67-4475 - IEIS, 1967.