THE COLUMBIA SCHOOL SYSTEM FOR ADMINISTRATIVE APPLICATIONS OF MICROCOMPUTERS IN THE HIGH SCHOOL LEVEL:THREE CASE STUDIES

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

in

FACULTY OF GRADUATE STUDIES

UNIVERSITY OF MANITOBA

by

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DECEMBER, 1989

ISBN 0-315-63297-6

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A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF EDUCATION

ACKNOWLEDGEMENTS

I wish to acknowledge many individuals who assisted me throughout the production of my thesis:

Dr. H. Williams who guided me in each step of the way with advice on the topic and content.

Dr. L. Jansson who served as a committee member and filled in as my advisor while Dr. Williams was away on sabbatical.

Dr. H. May who served on my advisory committee and offered helpful suggestions.

Dr. J. Pankiewicz who offered a great deal of help with the questionnaire and was one of the three experts on the school sites who filled it out.

Mr. T. Stoews who graciously consented to fill out the questionnaire for his school

Mr. M. Grott who graciously consented to fill out the questionnaire for his school

Mr. J. Fast who filled in for Mr. Grott and answered my questions in a personal interview

My wife, Laraine, without whose continual support, patience, and prodding, my work could not have reached completion.

ABSTRACT

This case study analyzes and evaluates the computer information system called "The School System" by Columbia Computing Service in three High Schools in a metropolitan city in Canada. The study focuses on five areas; 1)school demographics, 2)effectiveness of the previously used system, 3)demographic data on the present hardware, software version and modules used, as well as the time-on-task, 4)professional development, and 5)general effectiveness and satisfaction with the system.

A questionnaire, completed by a knowledgeable administrator at each of the sites, was followed by a personal interview in order to allow the administrator to comment on his answers.

The findings indicated that equipment requirements varied among the schools, but in general, they included a central computer with at least the speed of a 286 processor attached to a number of substations allowing multiple access to the main computer. "The School System" by Columbia performed many of the more tedious operations such as student records, attendance, and scheduling effectively. The administrators were satisfied with the automation process and expressed their feelings about the importance and necessity of this process in strong terms.

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Chapter I

INTRODUCTION

In the past several years, the computer has made inroads into most aspects of our lives. As educational tools, computers offer seemingly unlimited possibilities to help in the instructional process. Only in the last few years, however, have most public school administrators begun to use computers to help them do their job more effectively.

BACKGROUND TO THE STUDY, RATIONALE

What has contributed to bringing the computer into the school office is the fact that computers have become affordable, and a great variety of specialty software has been developed to deal with the specific administrative needs of the school. This study examines the uses of the computer as a tool in the high school office. Most of the literature relating to the use of computers for school administration deals primarily with mainframe computers or generalized software on micro computers. The focus of this study is the specialized software package "The School System" by Columbia (hereafter referred to as the Columbia System). So as not to exceed the scope of this study, the recommendations will focus only on this system and

the hardware needed to support it. This does not imply that other systems would not be good, or even more desirable than the Columbia System.

STATEMENT OF THE PROBLEM

In recent years more and more schools have been using computers in their offices to perform many of the administrative functions. The transition to a computerized office presents problems because there are few experts who understand both computers and the administrative needs of the typical school. As a consequence, wrong decisions are often made that must be corrected later, resulting in both loss of time and money.

In these days of budgetary restraints in all sectors of the society including Education, it is very important that the decisions made by the administrators be right the first time in order to serve present as well as future needs. Therefore the administrator must have sufficient knowledge about the automation process so that he/she can make decisions. However, as McGraw (1966) noted "Unfortunately, few administrators have been trained to use them; few administrators understand the tools' place in our society."

The automation process is complex, bringing together many different elements. First, equipment must be identified that will meet present as well as future needs. To do this one must be able to ask the right questions to assess those needs and to interpret the answers in terms of equipment (memory capability and/or speed of operation). Secondly, there is the program which must both fit the school's needs as well as its equipment. Finally, there is the need to implement this change effectively. This implies having a clear plan for the process as well as an understanding of the dynamics involved in learning to use a computer and a particular programs.

Administrators have very little outside professional help to assist them in this complex undertaking and those who have ventured into automation are usually on the cutting edge of technology and are, for the most part, pushing it beyond its current limit. They are demanding of the computer more than was considered reasonable in the original plans and, in essence, are shaping the form that the future use of the computer will take. According to Mojkowski (1986): "Rather than merely anticipate the future, principals will need to invent it".

Administrators also do not have the time to delve deeply into this vast field. There is such a proliferation of computer material in the form of magazines and journals that one can easily be overwhelmed, even if one were to limit one's reading to educational journals. Much of that material is virtually useless to the school administrator who is contemplating automating the office and is looking for guidance. The problem is how to separate the wheat from the chaff in this field. This thesis will attempt to bring together the relevant information and focus on practical steps to be taken in the automation process.

DEFINITION OF TERMS

Computer terms used in this study are defined here.

Disk Drive: The mechanical device that holds and rotates the disk containing the programs.

Diskette (Disk): A plastic disk coated with a magnetic substance that is able to store the programs and the files created by the program. Disks come in two forms:

a)floppy (made of a soft flexible material),

b)hard (made of a hard metallic material)

see Fixed Disk.

Fixed Disk: A disk that is a permanent part of the computer. Often used interchangeably with the term hard disk. It may be internal (inside the basic box of the computer) or external (outside).

Hard Copy: Computer generated text or diagrams in printed form on paper.

Hardware: The computer and electronic or mechanical devices used in connection with the computer.

Mainframe: A large computer with many terminals.

Microcomputer: One of a large family of desk top machines that usually stand alone.

Minicomputer: A mid size computer with less memory and fewer terminals than a mainframe.

Modem: A device that physically connects a computer to a telephone line for the purpose of transmitting data.

Monitor: The screen which visually displays the computer output.

Optic Reader: See scanner.

Password: A key to a specific file or program, without which the file or program is effectively locked and inaccessible to the computer user

Scanner: An electronic device that translates written text or diagrams into computer data.

Semestered: A timetabling structure where the courses are covered in time blocks that are a portion of the year. Usually 2 blocks per year.

Soft copy: Text in electronic form found in the memory of the computer and displayed on the monitor.

Software: A computer program.

Terminal: A station consisting of the monitor and keyboard. It may contain no memory (dumb) or it may be equivalent to a computer (smart).

ACRONYMS

The various acronyms are defined here.

CAI: Computer Assisted Instruction. A program on the computer that helps instruct a student in a particular subject matter.

CAL: Computer Assisted Learning. A term sometimes use as synonymous with CAI. Refers to the learning process when using the computer in the delivery of the instruction.

CEMAS: Computer Educational Management Accounting System. A SIMS program manufactured by Computerlab

CIS: Computer-based Information System. A data base system that keeps track of information on a particular group of people or things.

CMI: Computer Managed Instruction. A computer program that could do the same thing as CAI but also keeps track of the students' progress directly on the computer

DOS: Disk Operating System. Programs used to handle the general operations of the disk drive.

OMR: Optical Mark Reader

PC/AT: An IBM terminology for their advance technology computer using the 80286 processor

PC/XT: An IBM terminology for their basic hard drive computer using the 8086 processor

RAM: Random Access Memory. Memory in the computer that temporarily stores the program and its operation.

ROM: Read Only Memory. Memory in the computer that contains all the algorithms and functions needed to operate the computer.

SIMS: School Information Management System. Similar to CIS but is a more generalized term in that it may also refer to non-computerized systems.

SIRS: Student Information and Records System. A SIMS program manufactured by Management Information Group.

TSS: The School System. A SIMS program manufactured by Columbia Computing Services.

RESEARCH QUESTIONS

The study addressed the following questions:

- What is the capability of the Columbia System?
- What are its limitations?
- What are the hardware requirements to handle the program effectively?
- How do the administrators perceive the computerized system's effectiveness as compared with the previous non-computerized methods?
- What are the time demands of the system on the administrators and support staff?

Chapter II

REVIEW OF THE LITERATURE

This literature review examines the general field of high school computerization from the past to future possibilities. Administrative functions are examined to set the stage for the rest of the review which deals directly with the computer-based information system. The review concludes with the computer knowledge that modern administrators need, and the general outline of the key elements in an implementation plan.

Several studies have been performed and much has been written in a general way relating to computers and the school administrator. One study by Wright and Valbonesi (1985) of the Alberta Department of Education in the Edmonton Public Schools that relates directly to this study is the report entitled "Microcomputer Based School Information Management Systems (SIMS) in Alberta Junior and Senior High Schools. Final Report.". It consists of a detailed evaluation of three IBM microcomputer based SIMSs. The three SIMSs are:Student Information and Records System (SIRS) produced by Management Information Group, The School System (TSS) produced by Columbia Computing Services (the Columbia System studied in this thesis), and the

Computer Educational Management Accounting System (CEMAS) produced by Computerlab.

The three systems were evaluated on six major factors: product scope and function, ease of use, technical considerations, support and services, product qualifications, and vendor support. The evaluation, conducted in real school systems using full school data, examined all the characteristics of the three systems.

The School System study was conducted in four schools ranging in population from 463 students to 1846 students. Table 1 below gives the amount of time used by the processor for various operations. The study concluded with the general strengths and weaknesses of each of the systems. The comment and conclusion section states that "The results of this project further show that one system, notably, The School System by Columbia Computing Services, can effectively meet the needs of both the junior and senior high schools." (p. 132)

HISTORY OF HIGH SCHOOL COMPUTERIZATION

Very little was published on the subject of computer application in educational administration

Table 1

System Performance Indicator in Alberta Study

Operation	School A	School B*	School C	School D
scheduler time (Hrs)	3:30	2:30-3:00	1:30	2:10
scheduler performance	94%	100%	89%	98%
timetables		5:00-6:00	11:00	
conflict matrix			3:45	
course tally			0:55	
master schedule		0:30	1:00	0:40
class list/ atten. reg.		5-7min/cl	9:20 hrs	2-3min/cl
marks registers			9:20	
student reg.			1:00	

* School B used a PC/XT while the others used PC/AT's

prior to 1985. What was published dealt almost exclusively with large mainframe machines installed in large educational establishments, such as universities. Only the mainframe articles that were considered relevant to microcomputers were reviewed.

Some notable past efforts at automation have been documented and serve as good examples of how to implement a new computer system. In particular, the work of the Iowa Educational Information Center, with a grant from the Ford foundation, provided a data base that had a lot of positive features. The Iowa data base was used to keep track of the 650,000 students in the elementary and secondary schools throughout the State. (Lindquist, 1966,pp. 41-53) Another relevant study of mainframe application was a survey of Local Education Authorities (LEA) in England and Wales. (Streatfield and Thompson, 1983)

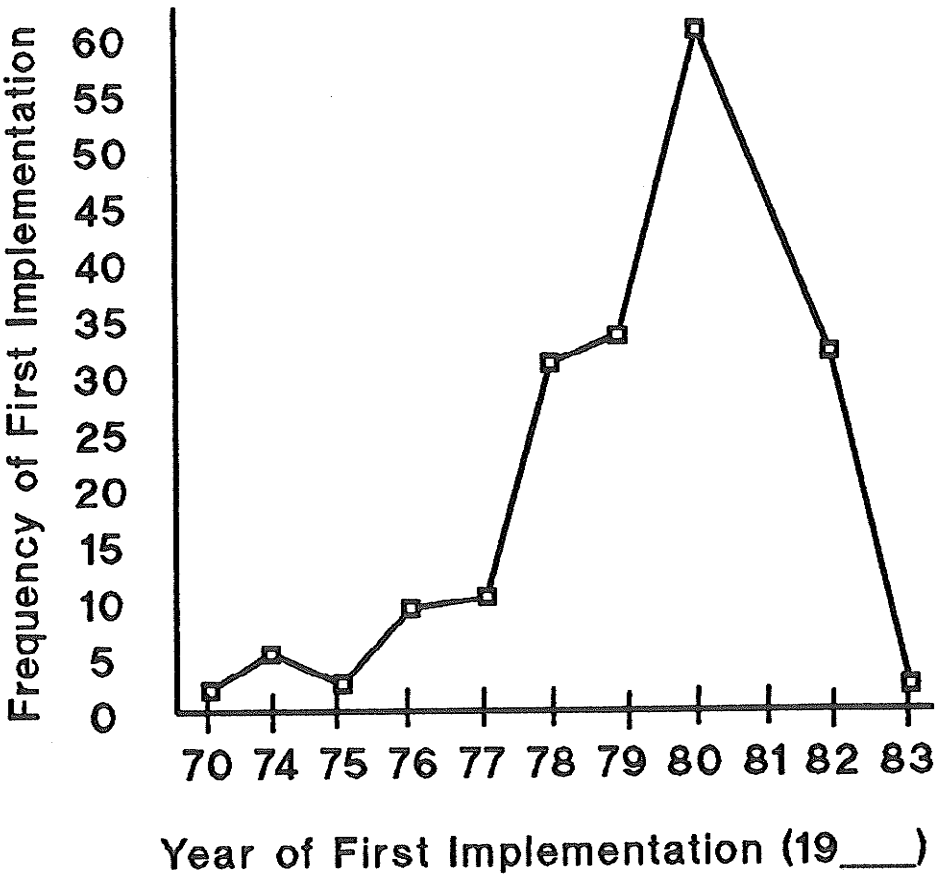
By the 1980's the microcomputer evolved to the point where it became a tool that was powerful enough to have real application in the school office. "System design has improved to the point that it is not unusual any more to find a small school or school district with a new micro-based system that has more features and

flexibility than a school district with an older expensive mainframe system." (Pogrow, 1985)

The educational system in our society is a complex entity. This complexity presents many problems to the administrator who must undertake the functions of "planning, organizing, motivating, and controlling" (Hersey, 1969) the system. Fortunately, we have available to us the tools that are necessary to handle the information in a complex enterprise. "To gain greater control over the collection, analysis, and use of management information, schools are increasingly purchasing stand-alone microcomputers to perform specific types of applications" (Progrow, 1985, 46). By 1985 the microcomputer in the school office had come of age. Present machines are powerful enough to handle the complex operations of even a very large High School. "Considering that microcomputers have only been available for purchase by the schools since 1977, it is surprising how rapidly they have been integrated into many facets of Educational use." (Ogletree & Haskin, 1983, 1). Figure 1, based on data collected from a study undertook by Beach and Vacca (1982), illustrates the rapid growth of computer acquisition.

Figure 1

Year of First Microcomputer Aquisition in High Schools in the Six States: Alabama Florida, Kentucky, Louisiana, Tennessee and Virginia



A similar study was done by Hamilton and Casserly (1983).

Software developed for early administrative application on mainframe computers were usually custom packages developed at great expense to the institution. As the shift towards smaller stand-alone computers developed so did the shift towards more general "off the Shelf" types of software.

Many of the early administrative microcomputer applications in the schools centered around three kinds of general business software: word processors, data bases, and electronic spreadsheets. Authors who wrote on this subject in and around 1983 dealt almost exclusively with these three kinds of software. A few examples are:Frankel (1983), Spuck and Atkinson (1983), Brown (1983), Brown and Droegemueller (1983), Brown and CLark (1984), Gander (1984) and O'Daniel (1984).
By 1983, administrators were looking for specialized software that would fulfill the special needs of the school administrator, as opposed to those of the business executive. Such software was not long in coming!

FUTURE OF HIGH SCHOOL COMPUTERIZATION

If the computer has already made a significant impact in the administrative office of the school, what can we expect to happen in the near future? A report by the Office of Technology Assessment (1982) states "Computers and computer-based information services will be ubiquitous by the next century, and learning how to use them effectively is a basic skill that will be required for many and perhaps most jobs." (p. 3). Other authors have supported this view. Marshall (1984) compares the computer revolution to "a high speed locomotive" (p. 2) that one is not likely to halt.

If the computer in the office is inevitable the principal will have to learn new skills to deal with it. As Slovacek and Dolence (1985) mention "...micros probably will not be replacing any staff of administrators. Rather, they will be used as a productivity tool and will refocus managerial efforts to include new tasks". (p. 2) Bone (1980) says "the principal of the future will have to have mastered the technical skills of his day, and it will be important that he is able to make the best possible use of the power which the new electronic revolution will give him." (p. 101) The problem is actually deeper than just

a lack of training or understanding. Indeed administrators will have to think differently due to computer use. Michael (1966) states:

> The quality of management in government or industry will change and those doing the tasks of management will need more flexibility, imagination, and fundamental intelligence than is now usually the case. This is so because organizations will be far less dependent on men to do routine decision-making tasks which require little originality, imagination, or high levels of intelligence." (p. 59)

The office of the future will process information electronically thereby minimizing the use of paper. (See Ragsdale (1982) for his view of the office of the future). The computer will change the ways things get done. Manzo (1981) envisions a school where students register for classes much the same way that one books passage on an airplane. Sanders, Speedie, Richardson, Van Dusseldorp, Ellis, and Adams (1978) see the computer as a decision making tool that will help the principal deal with problems that are becoming more and more complex. Sidman (1979) provides a list that is three and a half pages long of possible administrative

applications of computers in a school. Some studies (Beach and Vacca 1982) even suggest that principals that use computers are significantly more effective as measured on the Leader Effectiveness & Adaptability Description (LEAD) survey. "The sample mean [for principals that used computers] was 9.8, while that of the general population is 6". (p. 43)

From the above, we can see that the principal of the future will have to be computer literate or loose touch with what is going on in the school. That will mean that he/she will have to keep up to date with the technology as it develops. Because the technology is developing so fast, the principal will be in a constant state of learning and growth. The principal of the future will need the imagination to envision the possibilities of that technology and argue convincingly for its need in the school.

ADMINISTRATIVE FUNCTIONS IN THE SCHOOL

A Survey of Alberta Schools done by Petruk (1986) studied (among other things) the uses of microcomputers for administrative tasks in the senior high schools. The results of that survey are summarized in table 2.

Respondents were also asked to indicate which administrative software packages they expected to be

using next year, and which software packages they "should" be using. The summary of responses to these questions is presented in table 3.

Table 2

Use of Microcomputers for Administrative tasks Senior High Schools

Type of Use	No. of Schools
Word Processing Software	47 (66.2%)
Grade/Attendance recording	34 (47.9%)
School Timetabling	33 (46.5%)
School Scheduling Software	31 (43.7%)
Spreadsheet Software	25 (35.2%)
Data Base Management Software	25 (35.2%)
Integrated Software	21 (29.6%)
Communication Software	17 (23.9%)
School Accounting	15 (21.1%)
School Bus Scheduling	0 (0.0%)

Dennis (1979) offers a detailed list of the administrative functions the computer can do. As an introduction he says;

Table 3

Expected Use of Microcomputers for Administrative tasks Next Year and Perception of Software That Should be Used for Administrative Task- Senior High Schools

Type of Use	No. of Schools will use	should use
Word Processing Software	3(4.2%)	7(9.9%)
Grade/Attendance recording	8(11.3%)	7(9.9%)
School Timetabling	7(9.9%)	7(9.9%)
School Scheduling Software	10(14.1%)	6(8.4%)
Spreadsheet Software	7(9.9%)	11(15.4%)
Data Base Management Software	4(5.6%)	12(16.9%)
Integrated Software	7(9.9%)	11(15.4%)
Communication Software	3(4.2%)	14(19.7%)
School Accounting	10(14.1%)	14(19.7%)
School Bus Scheduling	1(1.4%)	7(9.9%)

"A large portion of a school administrator's duties involve management. The things that are managed are people (of several types), money, facilities and other resources, learning, and time. One of the most important bases or ingredients of management is information. The

school administrator cannot function without information. And the quality of the information available determines, in large measure, the quality of the management achieved." (p.2)

Dennis then breaks down the types of information into three categories with a series of sub categories in each. His information is summarized in table 4.

Table 4

School Information Types and Uses

Information type	Uses
Student information	Registration Class Scheduling Attendance Recording Grading Fee Assessment and Accounting
Financial information	Operating Data Base Management Data Base
Personnel information	Personal Identification data Professional Identification and Qualification data Current Assignment data Alternate Utilization data

Other authors give lists that are variations of these list. Some such as Zahniser (1983) and Peseau

(1986) are quite detailed. Other such as Olgetree and Haskins (1983) are more general.

COMPUTER BASED INFORMATION SYSTEM (C.I.S.)

The heart of any automated office is a Computer-based Information System (C.I.S.). The system contains all kinds of information and is accessible by different people for various purposes. Bluhm (1987) separates the type of information into three categories to be accessed by three groups of people. The three types of information are: 1) information for planning (historical data and trends) to be accessed by top administrators such as superintendents and their assistants, 2) information for direction and control (monitoring and regulating) to be accessed by middle administrators such as principals and department heads, 3) information for operations (day-to-day activities) to be accessed by clerical and production staff.

Other authors such as Ellis (1984) see the administrative use of computers as falling into four broad categories of data management, data analysis, word-processing, and communications. These four categories deal with most aspects of the school's operation. The data management would include student records, personnel records, inventories of equipment,

financial records and special management records such as transportation, food services, energy management, and sports programs. Data analysis allow more informed decision making in areas such as budgeting, enrollment projections and time management. Word processing enables administrators to compose, address, revise, combine, rearrange or delete written copy and to print it in a wide variety of formats that can be preaddressed and/or personalized. Finally, communications allows the administrator to access other machines and gives members of his/her staff access to information that would be useful in their work.

There are many advantages to a C.I.S.. Harris (1985) in an article dealing with management in general, makes a number of points that are equally valid for school administrators in particular.

- more effective analysis
- improved decision-making at all levels of management
- meaningful studies
- better organizational communication
- facilitate scheduling, planning, and calender management, as well as inventory control
- a 25% reduction in unproductive time
- more effective coordination of office and factory activities

- decision making is being pushed downward in the organization.

PHYSICAL AND OTHER ATTRIBUTES OF C.I.S.

Hussain (1973) states that the attributes of an information system are timeliness, accuracy, relevancy, and completeness. Timeliness means that the information desired is up to date and available in the form and at the time needed. Accuracy means that the system is free of error. Types of errors are input errors, incorrect processing rules, improperly followed or poorly designed procedures and equipment or processing breakdown. Relevancy refers to the fact that the information is pertinent and in a form that is convenient and conducive to proper decision making. Completeness means that all the information that is needed for proper decision making is available in the system.

The physical space one has in the administration center also affects the computer configuration. Adequate space must be made available, preferably in a quiet and isolated spot.

In general, some of the possible configurations are:

1. One computer (probably with a hard disk) with one printer

2. One central computer (definitely with a hard disk drive) to which is attached a printer and one or more substations that accesses the information found in the central computer
3. One central computer (definitely with a hard disk drive) to which is attached a printer and one or more computer(s) in a network configuration
4. One mini-computer to which is attached one or more printer(s) and several substations that access the information found in the central mini-computer.

Ellis (1984) and Pogrow (1986) state what they considered the minimum computer configuration for administrative purposes **at that time.** Their list included 64K RAM memory and two floppy disk drives. Slater and Lynch (1986) suggest a number of features to look for when deciding between mini and micro computers.

Each of the above configurations could have optional input devices such as card readers or optic readers, as well as optional output devices such as a modem to connect the computer to a telephone line for accessing other computers or the homes of the students.

Which input and/or output device is to be added will be dictated by cost and the ability of the software to make use of these devices. For example, if the particular software being used in the office has the capability of automatically phoning homes and relaying a message, then a modem may be desirable to inform parents of their son's or daughter's absence that day. Without that capability, the modem may be a useless piece of extra equipment. The optic reader is probably unnecessary unless one has an attendance package in the software being used.

TYPES OF C.I.S.

In terms of software Pogrow (1986) mentions that high school principals tell him "the administrative tasks they most need help with are period-by-period attendance recording, student scheduling, and grade reporting" (p.28). Any software package that a principal is considering should include the three applications in one rather than three separate pieces of software that work independently. There are other special application programs that have validity. Such programs as computerized home dialing, library management, word processing and perhaps financial management at the school level, and also financial

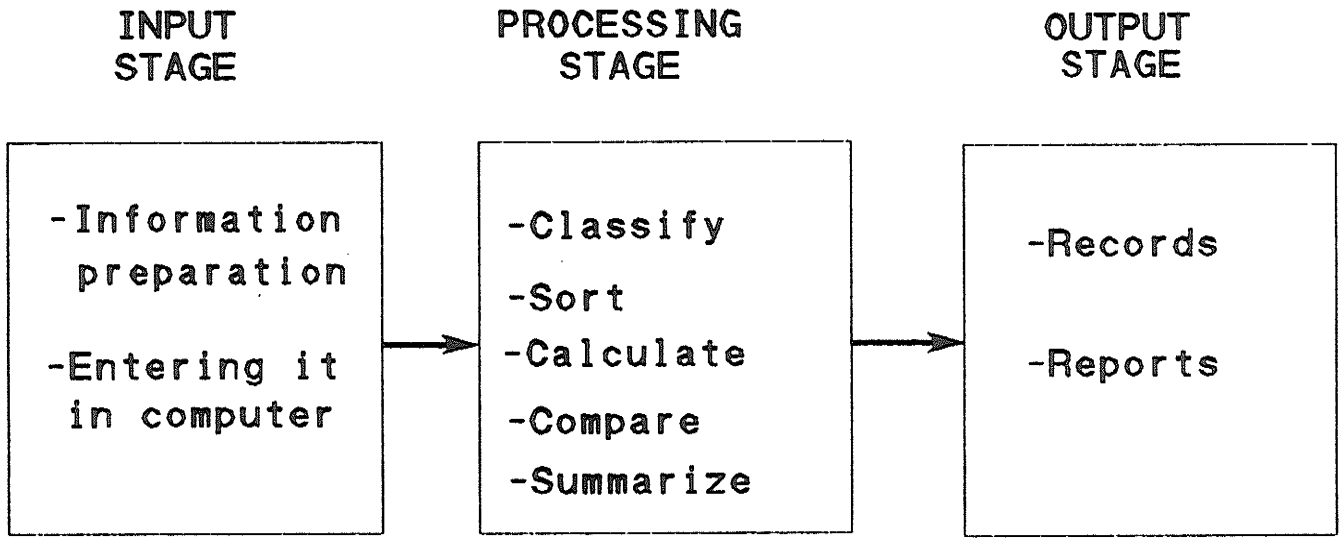
management, energy management, transportation, at the central office level. Another type of special applications which is less common but no less important is a job application system described by Sawyer (1988). This system allows a principal to identify and list qualified applicants, broken down by certification area or grade level. All of these various applications go through three stages of process as shown in figure 2. The input stage will have to contain information on student demographics, attendance, academic performance, and course schedule. The processing stage should be able to produce reports and information on individuals but should also be able to generate summaries and totals in the output stage that give the administrator useful information for decision-making.

CONCERNS OF C.I.S.

There are intangibles that make the decision to automate a difficult one. What, if any, will be the saving in human resources? Given present budget restraints, is the inevitable monetary sacrifice in other departments justified to pay for the initial outlay in computer equipment? Could the money be better spent purchasing other resources such as library

Figure 2

Three Stages of Processing Data



materials and teacher aides? Other questions are difficult to answer without a great deal of computer background and understanding on the part of the administrator who must oversee the automation process. Froese (1984) suggests that such background is sometimes lacking because of a "hesitance of administrators to become involved in a rapidly changing technology" (p. 63) Questions such as:

1. What type of information should be stored?
2. Who should have access to the information?
3. What safeguards will be needed to ensure against abuse?
4. What is the long range plan and how will it be phased in?

The answers to such questions are important if one is to ensure a smooth transition to computerization.

Crawford (1985) identified the following four major problems to deal with when a principal considers computerizing some of his office tasks:

1) Computer phobia, or the fear of problems which a computer might cause;

2) Initial cost, in that the initial hardware and software might outweigh the benefits to be gained;

3) computer illiteracy, or the lack of knowledge of which task can or cannot be performed by a computer;

4) Security, or the method needed to ensure limited access to data. (pp. 70-72)

Security becomes a concern when all the important information is concentrated in one container which is used by any number of people. In a non-computer system, delicate files can be placed in locked file-cabinets, and the keys can be physically controlled, so that only the person who has the authority to see the files, is able to do so. The computer uses a system of passwords to allow access to delicate files..

In his article, Crawford failed to identify a fifth possible problem that must be foreseen by the administrator, that of personnel. Who will be using the computer, and how will those people get their training? Sidman (1979) suggests that the "position of the computer on the organization chart plays an important part in determining whether or not the system will be utilized in an effective and efficient manner."

(p. 12) Dellow (1986) suggests that "the utilization of microcomputers by secretaries, clerical workers, or administrative assistants, in support of administrators is the most efficient use of the new technology."(p. 4)

A careful assessment of the qualities in the present staff is essential. Virtually anyone can be trained to use the computer, but, in some cases, a great deal of resistance will have to be overcome. Certainly some retraining will have to take place and that cost must be taken into consideration. A staff member eager to learn about this new tool will more readily accept the need for retraining and will progress much more rapidly in this retraining process.

BENEFITS OF C.I.S.

In order for a C.I.S. to function, the following conditions must be met:1) sufficient funds to purchase a suitably equipped computer system, 2) complete understanding of both the problems and the techniques to be used in solving them, 3) clearly defined and available data as input information, 4) an economical advantage for performing the job by computer rather than manually, and 5) knowing what the projected workloads will be. (Sidman, 1979 p. 48).

The benefits one gets from a C.I.S. have been argued extensively in a number of papers. The judicious use of a single microcomputer by a principal, it has been postulated, could save up to 200 hours-or the equivalent of 25 eight-hour days-in a school year (Give Computers to Administrators first, Researcher Urges), (1984). Weintraub (1985) argues that a computer can save time, but adds that it can also boost productivity and, in the end, save money in spite of the initial rather large capital expenditure outlay. Sharman and Cothern (1986) argue that the advantages of computers are so great that even reluctant principals must eventually accept them.

> "as our survey indicates, the growing dependence on computers for office work and the easing of price and training obstacles are positioning computers for rapid future growth in school administration. Frankly, we don't think you'll have much choice in the coming years; computers are$Éinyour future. Most of you will accept them because you recognize their potential for increasing productivity and for freeing you to provide the leadership you're hired to provide." (p. 33)

An extensive survey (Hansen, Klassen & Lindsay, 1978) on the impact computer information systems have had upon school and district administration concluded that, computer use facilitated more effective resource management, better decision making, better long-range planning, and more time to work with people.

WHAT SCHOOL ADMINISTRATORS SHOULD KNOW ABOUT COMPUTERS

Being aware of the pitfalls and problems of a computer system is as important as being aware of its benefits. As Davis (1963) says, "We are fast approaching the day when decision makers at all levels of our society will have to, at least, be aware of the capabilities and weakness of the computer, if they are to make intelligent choices." (p. 106) Coffin (1985) makes a similar statement when he says:

> No one expects the principal to be an expert in everything. The job calls for a jack of all trades and, hopefully, a master of at least one--teaching. But principals must be sufficiently knowledgeable about all school activities and functions to support and assist the people who have particular expertise in any one area, including custodians, secretaries, cafeteria

> workers, counselors, and teachers--even those who are computer 'experts.' If the principal refuses to gain this minimal knowledge of computers in education, he/she may become the tail of the dog. (p. 14)

All of the pitfalls of computers and their operations can be avoided with proper care and procedures. Knowledge is the best safeguard against inordinate fears and hesitancies. The principal should keep in mind that the microcomputer does not solve problems, it performs tasks. It is a tool like many other tool in his office and it should be viewed as such. Computer illiteracy is less of a problem as more and more people are increasingly exposed to computer applications. Retail outlets as well as centers, such as the Education Technology Program (ETP) in Manitoba, offer a wide array of computer workshops for principals to attend. Two sources that are well worth studying in order to become computer literate are: 1) a guide written by Zahniser, Long and Nasman (1983) which is designed to help educators sort through the vast amount of information that exists about the educational use of microcomputers. (Order No. RD239B --$9.50), 2) A guide written for the Center for Vocational Leadership

(Microcomputer Resource Guide for Vocational Administrators, 1985) has a section which presents competencies deemed necessary for an administrator to use the computer as a tool in the conduct of his/her job.

One does not need to be an expert in computer operations in order to use computers and to make decisions about computerizing an operation. A working knowledge of the computer at the level of "driving the car" is sufficient for the most part. "The ease of using new software makes it more feasible for individual without technical background to use computers effectively." (Pogrow, 1984, p. 75) While the installation of a system may require an expert's input, the decision-making process requires only a basic background of knowledge. Froese (1984) defines two components necessary for an administrator to call himself literate. These are:

1) being familiar with the administrative tasks the microcomputer can be expected to perform
2) becoming experienced in using the microcomputer with packaged administrative programs (p. 64)

Lantz (1984) tested a more detailed list of dimensions of computer literacy and found the following points

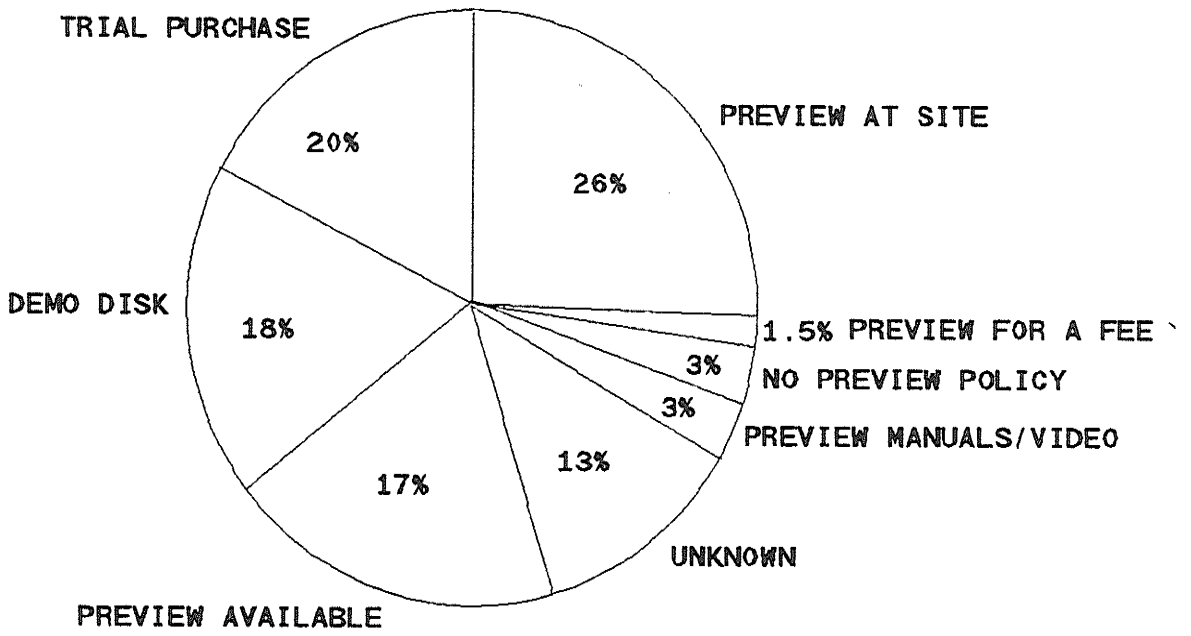
were validated by the vocational educators interviewed. While many would quarrel with the last point on the list, the other points are still valid.

1. Knowledge of ethical and legal computer use
2. Knowledge of innovative application and uses of the computer
3. Keyboarding skills
4. Extension of computational, word processing, graphics, and simulation capabilities
5. Knowledge of widely used software packages
6. Database use skills
7. Skills associated with formal problem analysis by use of the computer
8. Familiarity with a programming language (BASIC or PASCAL) and operating system or an introductory understanding of UNIX Operating system and C language as well as authoring languages (for example, PILOT). (p.11)

What are administrators expected to know with respect to the vendors? A detailed study by Weaver (1985) analyzed the preview policies of 492 producers of educational software. Figure 3 illustrates the results of this study. As one can see from the diagram, 81% of the vendors allowed some form of free

Figure 3

Software Producer Policies on Previewing



previewing such as previewing at site or demo disks. Software of this complexity should never be purchased unless one has previewed it somehow, preferably on one's own equipment. Trial purchase is acceptable if one is dealing with a known and reputable retail outlet, however, one should be sure to get the agreement in writing.

IMPLEMENTATION PLANS

Weighing the initial cost of installing a computer in the school office against the benefits to be gained from such a purchase is probably the most difficult decision the administrator has to make in the automation process. Declining hardware costs are making the decision easier, but there are still many factors to be considered. When making the decision one is advised to keep in mind future needs as well as present needs. However, as Hoachlander (1983) cautions, there is no such thing as the **perfect** system. "Pursuing the "perfect system' is an elusive, never-ending quest that will leave the user with nothing rather than the ideal system that meets all one;s present and future needs." (p. 12)

The principal should have a clear idea of what tasks are to be performed and make sure they have the

characteristics which would justify their being performed on the computer. As Poirot (1981) suggests, they should meet the following four criteria:

1. The amount of data to be processed is massive and the operations to be performed are well defined
2) Processing is highly repetitive
3) Speed of processing is important
4) The task(s) to be performed is (are) not practical to perform by manual means (p 31)

One can automate for the wrong reasons. Sheehan and Newsted (1984) point out some misconceptions that one should not fall victim to in acquiring the new technology:

- Using new technology solves the traditional information analysis problems;
- Using new technology short-circuits the planning process;
- The introduction of micros and personal computers is immune to the normal resistance to innovation type of problems. There are many nervous new users;
- My micro will make the data right.

General implementation plans

Overall there are certain steps in the implementation procedure that one should follow. As Kiser (1984) outlines:

"Major sets of tasks needing written procedure include:

- Planning the computer system
- Procuring hardware, software, and computer system
- Training operators in each CAO [Computer Aided Office Work] and CAA [Computer Aided Administration] application
- Providing security of hardware, software, & diskettes
- Developing computer curricula
- Evaluating the computer system" (p. 9)

Thomas (1984) says the same thing with a simplified list "(1) decide what functions should be automated and in what order of priority, (2) identify software that bests automates these functions, and (3) identify hardware that runs the selected software."(p. 2) The New Jersey School Board Association offers some additional "common-sense guidelines" for purchasing and implementing an administrative system. Neill (1986) gives a good summery of those guidelines:

"-Fully test the hardware system, configured to meet your specific data retrieval, storage, and manipulation requirements.

-Get an evaluation of your system configuration from other users who have experience with the system.

-Do not buy a hardware system to serve multiple functions, that is, a system for both administrative and instructional purposes.

-Allow sufficient time for the selection/ purchasing process. Do not rush into purchasing any hardware/software configuration, no matter what its reputation.

-Do not eliminate old procedures and systems until the new configuration is fully operational. In fact, operate the old and the new in tandem for a substantial period of time before dismantling the old."(p. 77)

Other authors offer similar information on implementation plans. Creighton (1986) discusses the implementation of a school bus scheduling system but has good general guidelines. Neill (1983) has a section "Tips on Planning" while Ellis (1984) has steps to computerize the school office. Newton (1987) treats

the automation process in the broader picture of the change process in general.

O'Daniel (1984) discusses the impact automation has on five areas;People where the attitude often goes from fear of the unknown to acceptance and even addiction, roles that changes from boss and clerical to one of boss and more independent executive secretary, time which is made available by enhanced productivity made possible by the machine, organization which is changed because of retrieval systems and reporting capability of the computer, and dollars which has to be viewed and amortized over several years rather than the usual view of a yearly budget that most administrators have. Neill (1984) cautions not to underestimate "people problems" when implementing new technology. She offers some suggestions for lessening these problems.

- Implement gradually with sufficient training and time for practice
- Start with an application that is relatively simple and has a high probability of success
- don't try to convert the entire staff at once

- if the staff is large enough it is desirable to have a few people train at the same time so that they can support and interact with each other.

Possible configurations and use of the computer

What criteria should be kept in mind when planning for the hardware equipment that one will use? Crawford (1985) provides a list of such criteria:

1. Is the keyboard easy to use?
2. Is the display/monitor appropriate for the application planned?
3. Is the printer appropriate for the planned uses of output information?
4. How much and what kind of memory should be available?
5. How much and what kind of storage should be available?
6. What kind of processing speed is desirable?
7. How available is software for the microcomputer?
8. What operating system(s) is(are) necessary for the software being considered?
9. What type of interfacing with other computers is desirable?

10. What kind of reliability and durability does the hardware have?
11. How expandable should the hardware configuration be for future use?
12. What kind of reputation does the manufacturer as well as the retailer have for support?
13. Does the computer come with quality documentation?
14. What will it all cost? (pp.115-118)

Vendors

Where one should buy the equipment is almost as important a consideration as what should be bought. Scholes (1983) offers the following nine (9) criteria as a guideline when selecting a possible vendor for the equipment:

1. Market strength and growth potential of the company,
2. equipment configuration recommendations,
3. equipment software capability,
4. communication capability,
5. maintenance/service support,
6. references-evidence of educational familiarity,
7. special features,
8. educational training opportunities,

9. functionality.

Inhibiters to Automation

In there survey of high school principals, Beach and Vacca (1985) found that there were three main types of problems experienced by administrators in their computer implementation efforts. The problems and their relative importance (as indicated by the frequency of responses) is given in table 5 .

Table 5

Frequency Distribution of Implementation Problem Areas

Problem area	Frequency of problem responses	percentage of responses
Monetary Support	38	31.1
Lack of Training	34	27.9
Lack of Software	21	17.2
Other	11	9.0
No Response	18	14.8
TOTAL	122	

In the Florida State Department of Education guide to administrative uses of microcomputers (Educational administrator's guide to administrative uses of

microcomputers, 1983), one finds the following four (4) inhibitors to computerizing some of the office functions: initial cost, computer illiteracy, computer phobia, and security.

SUMMARY OF THE LITERATURE REVIEW

One can easily see from the above review that prior to 1975 virtually all of the school applications of computers dealt with large mainframe computers in University settings. The microcomputer came out on the market in 1977 and quickly made inroads into the general educational market. When the computer became sophisticated enough, it's advantages to business applications gave it a tremendous upswing in volume of sales. This volume, with a corresponding reduction in price, gave software developers the impetus to expand into the educational administration field. Companies like Columbia began developing microcomputer versions of the programs they had for the mainframe computers.

It was at this time that researchers began writing about how the computer could be used by school administrators and what were the computer's strengths and drawbacks. Initially authors tended to promote the use of general business software such as word-processors, spreadsheets and data bases. Gradually

more and more articles dealt with specific software, designed with the administration of a school in mind. Many administrators began implementing computer automation in their offices. The general tendency seems to be a filtering down from the high school level to the elementary. Because of the lack of options, the timetable at the elementary level tends to be very much simpler than that at the high school level. hence it is not likely that one will find the same degree of automation at the elementary level. Nevertheless, elementary schools have similar needs in terms of communication and record keeping and, to that extent, they have similar computer needs.

Chapter III

METHODOLOGY

Three secondary schools were selected for this study. All three were from a suburban setting in a large midwestern Canadian City; one was a large regional comprehensive school serving both academic and vocational students, and the other two were conventional high schools serving mostly academic students from the area.

A questionnaire (see appendix B) was given to one administrator at each school who had been involved in the computerization of the administrative office. The questionnaire examined four areas:

1) The school setting - those characteristics of the school that had an effect on timetabling and student records. Information was requested regarding grade levels housed in the school, size and nature of the student population, number of teachers and teaching loads, timetabling matters such as the number of days in the school cycle, the number of periods per day, the number of sections being offered and school calendar.

2) Previous administrative procedures - asking the administrator to make a value judgement on various procedures that were in place prior to the automation process. This section examined academic record gathering and reporting procedures, attendance keeping procedures, type of information kept in the cumulative files, the degree of use and the reliability of these files, type of teacher records, and timetabling procedures.

3) Equipment demographics - examining three areas: the equipment, the software, and the staff's use of the equipment. The first section asked for information regarding computer devices such as make and model of the computers, enhancing devices like math coprocessors or turbo boards, number of work stations, capacity of the hard disk, makes and models of printers, and the existence and purpose of other devices. The second section asked about the Columbia System that was being used, what system modules were implemented and the chronological order of their implementation. The third section asked about users: numbers of clerks and

administrators that used the system, amount of training received, and the amount of time spent using the system.

4) General comments and conclusions - regarding training sessions planned or in progress, stages of implementation of various modules of the program, and feelings about the degree of success they had in computerization.

The data from the three schools were summarized and analyzed. A follow-up personal interview was conducted to clarify some of the answers given on the questionnaire and to gain further insight on the strengths and weaknesses of the program.

Chapter IV

RESEARCH FINDINGS

SCHOOL DEMOGRAPHICS

Demographic data relating to the three schools in the study is summarized in Table 6.

Table 6

School Demographics

	school A	school B	school C
grade levels in the school	10-12	9-12	10-12
student population	1250	808	850
semestered	yes	yes/no	yes/no
normal class load for academic students(per@min)	3.5@80	3.5@80	8@40
normal class load for vocational students(per@min)	4@80	3.5@80	NA
number of teachers excluding library, guidance and administrative personnel	74	51	48

School A

Enrollment in the comprehensive school was divided equally between academic and vocational students. Vocational students took a vocational course for half a day and an academic program for the other half.

Enrollment in the school was drawn from a largely middle-class population and included a rather large number of vocational students with a wide range of abilities and background coming from other school divisions. The school year consisted of two semesters per year. The school day consisted of five 80-minute periods with students attending either periods 1 through 4 or 2 through 5. The average load for teachers of academic subjects was three periods per day and for vocational teachers 3.2 periods per day. Students were required to earn 20 credits in order to graduate, and normally earned 8 credits the first year, and 6 in each of the last two years. Each year the school schedules 270 academic sections and 224 vocational sections for it's students. Most courses were offered daily for one credit. A few courses, such as physical education and guidance programs were offered on alternate days of the two-day schedule for one-half credit each.

School B

The student population for this school was drawn entirely from a local, largely middle-class, population and included students with a wide range of abilities and background. Approximately 90% of the students were

academic and 10% vocational. Vocational students take a vocational courses for half a day and academic courses for the other half. The school was partially semestered but most of the courses ran for the full year. A few courses are offered during one semester only. Students were required to earn 20 credits in order to graduate, and normally earned 8 credits the first year, and 6 in each of the last two years. Each year the school offered 280 academic sections and 9 vocational sections. A few half credits courses such as physical education and guidance were offered on alternate days of a two-day schedule. Academic teachers taught an average of three out of the four periods in a normal school day, while vocational teachers generally taught four periods per day.

School C

The third school was largely academic, with a student population drawn entirely from a local, largely middle-class, population. Students in this school had a wide range of abilities and background. Half of the courses ran the full school year and the rest were semestered. Students were required to complete 20 credits in order to graduate, but often graduated with 22 credits by taking 8 credits the first year, and 7

credits in each of the last two years. Two hundred and sixty three academic sections and no vocational sections were scheduled each year over a five day cycle with teachers teaching an average of six of the eight periods in a normal school day.

COMPUTER SYSTEMS

Table 7 outlines some of the characteristics of the main computer used by each school.

Table 7

Computer Configurations

	school A	school B	school C
make of computer	IBM	IBM	MIND
model of computer	80	60	386
Processor	386	286	386
processor speed	16 MHz	10 MHz	12 MHz
internal memory (bytes)	2 Meg	2 Meg	1 Meg
hard disk memory (mega bytes)	70	70	30
number of years of using computers for administrative work	7 yrs	6 yrs	14 yrs
number of stations used for administrative work	5	6	2

School A

The computer system in school A is based on an Arcnet network system with the following devices attached;the PS2 model 80 as the file server, a PS2 model 50 as a main substation, 9 PS2 model 25's, 3 PS2 model 30's and one AT as network substations in various parts of the school.

Not all the workstations were used for administrative functions, some were attached to a network and used in various vocational and academic areas for demonstrations, CAD applications, robotic control, as well as for teacher use in record keeping and lesson preparation. Figure 4 is a schematic representation of the school's configuration. Three printers and a scanner were also attached to the network. The printers and their purpose are described in table 8. The system had a scanner attached for recording and controlling attendance.

School B

School B had an IBM model 60 acting as a main station with 6 PS2 model 25 attached as substations in various parts of the school. Figure 5 gives a schematic representation of this configuration.

Figure 4
Computer Configuration at School A

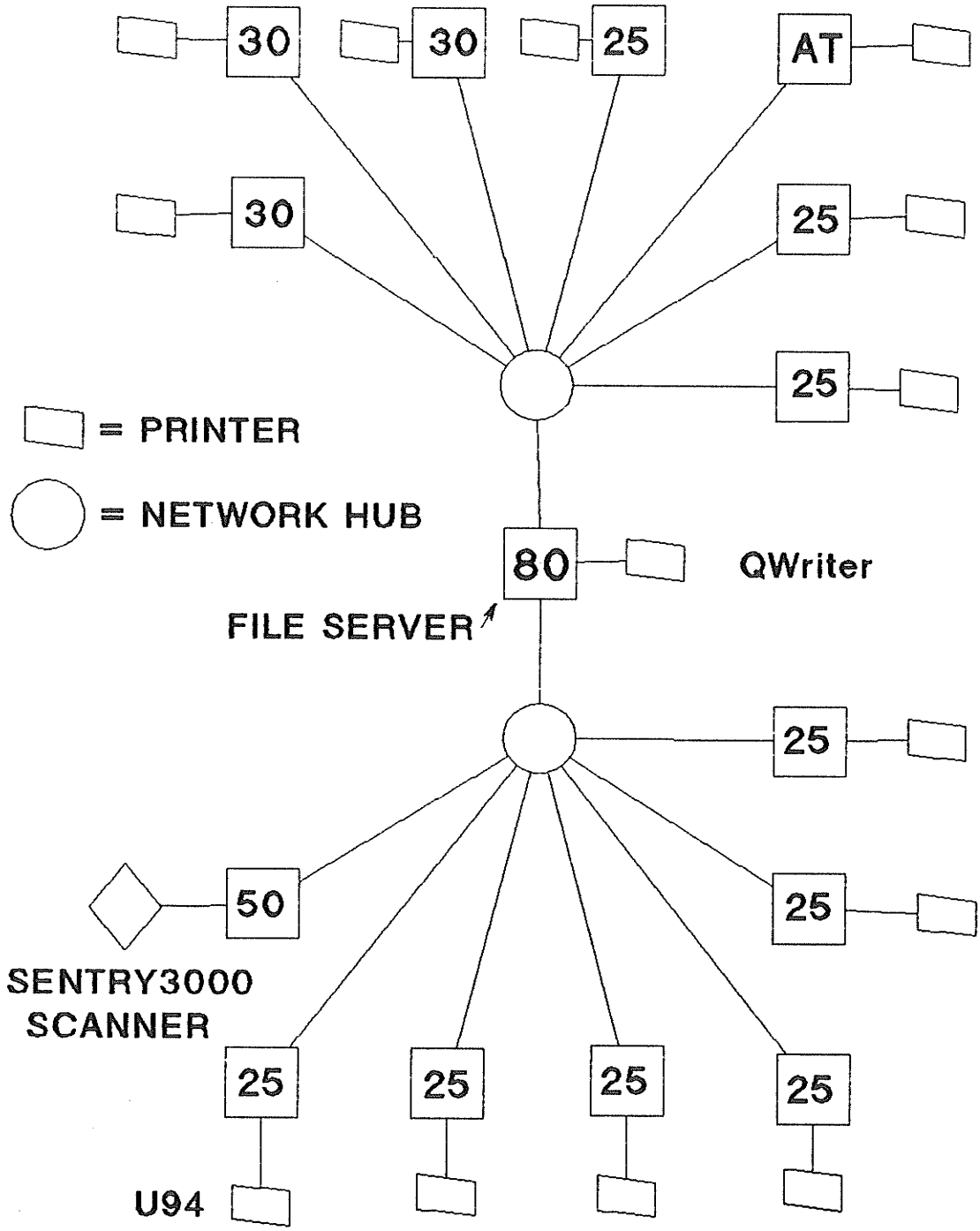


Table 8

School A Printers and Their Purpose

IBM Quickwriter	reports and long runs
Okidata U94	shorter reports and runs
Epson LQ 1050	correspondence

A C.Itoh 3500 printer and a scanner were also attached to various parts of the system. The computers and printers as well as their uses are outlined in table 9.

The system had an NSC Sentry 3000 scanner attached for recording and controlling attendance, for entering marks, as well as for entering the course selections at registration time.

School C

School C had a mind 386 computer acting as a main station with one OT700N printer attached and three mind 286 computers acting as substations in another parts of the school. Figure 6 gives a schematic representation of this configuration. Two other printers and a scanner were also attached to the system. The computers and printers as well as their use are outlined in table 10 below.

Figure 5
Computer Configuration at School B

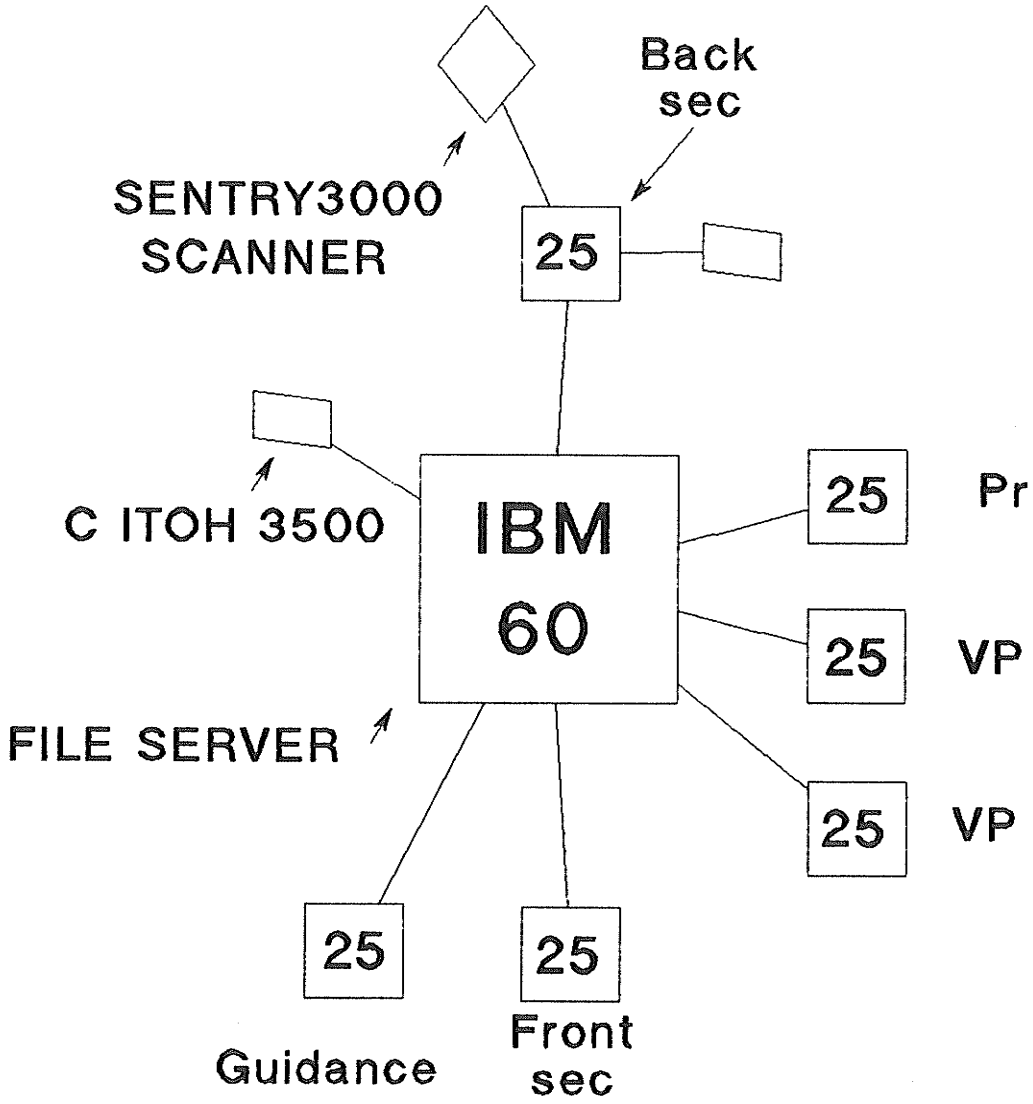


Table 9

School B Computers/Printers and Their Purpose

Equipment	Purpose
Computers	
3 model 25 in Admin. offices	call up student information
Model 25 for front secretary	enter data and call up student information
Model 25 for back secretary	enter data and run the system
Model 25	guidance
Printer	
C.Itoh 3500	reports and long runs

The system had an NSC Sentry 3000 scanner attached for recording and controlling attendance, for entering marks, as well as for scoring teacher tests during the course of the school year. The scanner was not used for scheduling the students at registration time.

Figure 6
Computer Configuration at School C

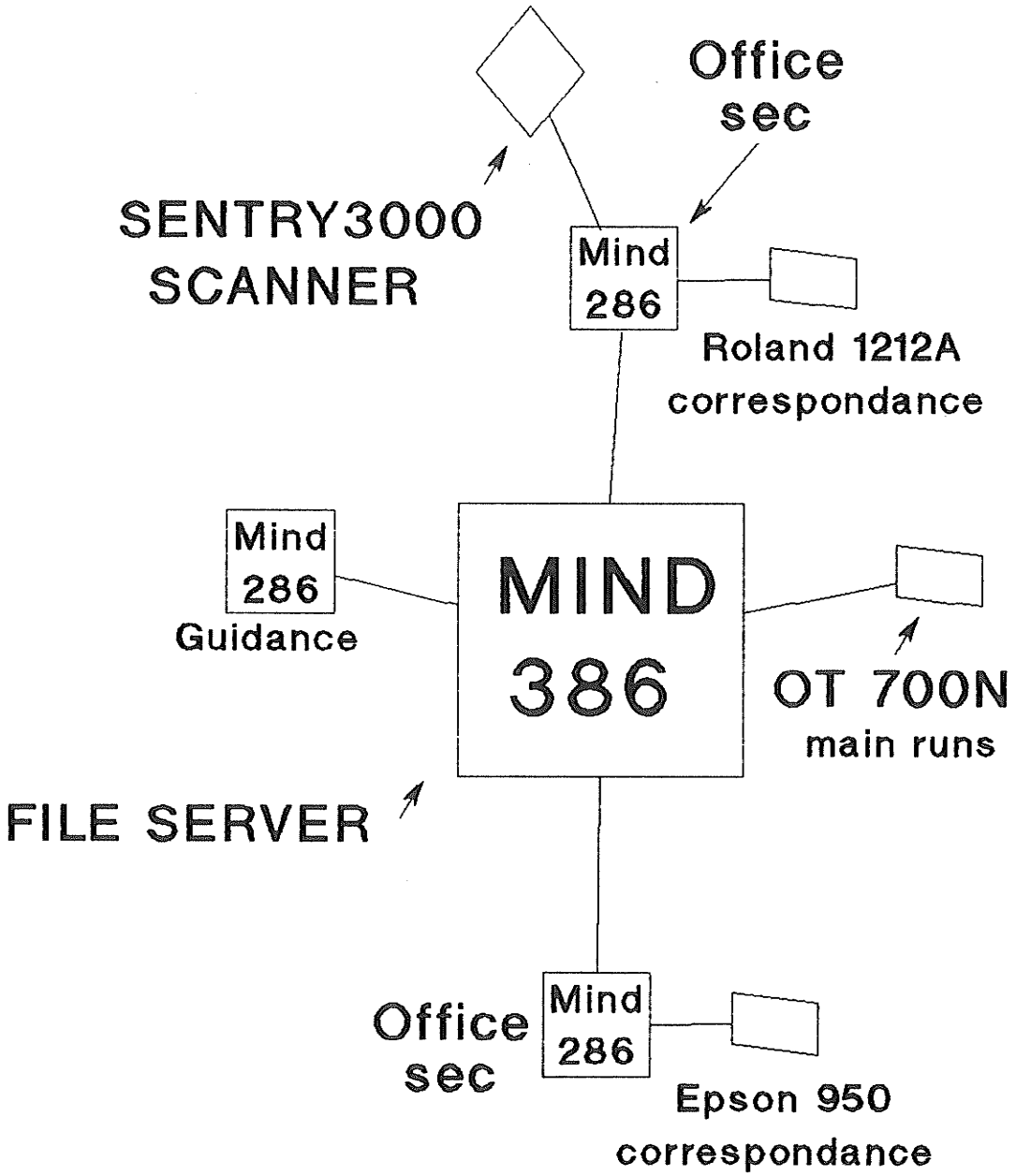


Table 10

School C Computers/Printers and Their Purpose

Equipment	Purpose
	Computers
Mind 386	main file server
2 Mind 286 in central office	entering data and general secretarial use
Mind 286	guidance
	Printers
OT 700N	report cards,scan sheets large reports
Roland 1212A	correspondence
Epson 950	correspondence

SOFTWARE CHARACTERISTICS

The Columbia System is an integrated computer information system for school management containing three major systems or parts that cover various aspects of the administration functions in a regular school. The three systems are:

a) **The Student Scheduling System** which allows one to schedule the students into any type of timetable up to 10 days, 32 periods, and 4 semesters

b) **The Attendance System** which allows one to keep attendance data on the students by day or by period

c) **The Academic Progress System** which allows one to keep marks data for the students

Four other programs are part of the Columbia System. These are:

a) **Utilities** which allow one to maintain the SCHOOL SYSTEM data base

b) **Optical Mark Input System** which allows one to use optical mark forms with a scanner

c) **File Builder** which allows one to create new files from files that have already been entered

d) **Master Builder** which allows one to build a master time-table

Each of the above systems has smaller sections within them called categories. Each category has subsections called functions. See Appendix A for a list of the categories, subsections and functions.

School A used version 6.1 of the Columbia System and has implemented all of the modules that come with the program. School B used version 6.06 but had implemented four of the modules that come with the program:student scheduling, attendance, master builder, and academic progress. School C used version 6.06 and had implemented three of the modules that come with the

program: student scheduling, attendance, and academic progress

PRIOR TO AUTOMATION

A knowledgeable administrator in each of the three schools was asked to describe and make value judgements regarding the following areas prior to automation:

a) The procedure for collecting the evaluations made by teachers and for writing out the report cards

b) The procedure for keeping attendance records

c) Cumulative file system of the school

d) Type of data kept in the cumulative file

e) File on teachers

f) Setting up the timetable

Each question had a series of options to be checked off if it applied and also ended with a space for comments.

QUESTION 1: Which of the following statements best describe your level of satisfaction with the procedure for collecting the evaluations made by the teachers, and for writing out the report cards? Check off all descriptions that apply.

ANSWERS:

Item	School A	School B	School C
a) Very Satisfactory			
b) Fairly good but time consuming	X	X	
c) Fair but costly			
d) Cumbersome for teachers	X		X
e) Cumbersome for office staff	X		
f) Prone to clerical error	X	X	
g) A disaster			
h) Other			

School A: caused friction among staff with late entries

QUESTION 2: Which statements below apply to the way attendance records were kept? Check off all that apply.

ANSWERS:

Item	School A	School B	School C
a) Very good			
b) Time consuming for teachers	X		
c) Inaccurate	X	X	
d) Not effective			
e) Difficult to manage	X	X	X
f) A lot of work for office staff	X	X	
g) Others School A: impossible to analyze			

QUESTION 3: Which statements describe the cumulative files your school kept? Check off all that apply.

ANSWERS:

Item	School A	B	C
a) We did not have cumulative files			
b) Files were poorly kept			
c) Records were frequently lost			
d) Files were stored but not checked or used		X	
e) Files often had errors	X		
f) Files were unreliable			X
g) Files were updated and well kept			
h) Files contained useless information	X		
i) Files were useful and frequently used			
j) Files were difficult to retrieve	X	X	X

k) Others

School A: Bulky and difficult to store and retrieve

School B: Attendance files, academic records, and demographics, were kept separately from cumulative files

QUESTION 4: What kind of data were kept in the cumulative files. Check off all that apply.

Item	School A	B	C
a) No records were kept			
b) Student demographic data	X	X	
c) Timetable of student		X	
d) Past report cards	X	X	X
e) Correspondence re student	X	X	
f) Medical records	X	X	
g) Others			

QUESTION 5: Which of the following teacher records were kept in your school? Check off all that apply.

ANSWERS:

Item	School A	B	C
a) None			
b) Certification papers		X	
c) Academic background		X	
d) Medical records			
e) Correspondence re the teacher			X
f) Personal or delicate information			X

g) Others
School A: evaluation reports, certification #'s and demographic data

QUESTION 6: In terms of setting up the timetable for teachers and students, check off the statements that describe your procedure.

ANSWERS:

Item	School A	B	C
a) A tedious and time consuming task	X	X	X
b) A challenging task		X	
c) A frustrating experience		X	
d) A job that is eagerly tackled			
e) A minor task in the overall job description			
f) Others School A: arena type of scheduling using a lot of manpower and time			

AUTOMATION IMPLEMENTATION PROCEDURE

The questions centering around this section deal with the questions number 11 to 19 of the Computer Demographics section of the questionnaire. The first question dealt with the modules that were implemented and the chronological order of implementation. The results of this question are summarized in table 11

with the numbers indicating the chronological order of implementation.

Table 11

Modules in Chronological Order of Implementation

Item	School		
	A	B	C
a) Attendance	1	1	1
b) Academic progress	2	2	2
c) Student scheduling	4	3	3
d) Master builder	3	4	
e) Fee accounting	5		

Two questions dealt with the training of the clerical and administrative staff. Table 12 summarizes the results of these questions.

In terms of the amount of time that was spent by the clerical staff on the office system there were also big variations. Table 13 shows these variation.

Table 12

Staff Training

School	Staff	no.	Total person-days	Average person-days
A	Clerical	6	30	>5
	Admin.	4	>30	>7.5
B	Clerical	2	<5	<2.5
	Admin.	2	5 - 10	2.5 - 5
C	Clerical	3.5	<5	<1.5
	Admin.	1	<5	<5

Table 13

Clerical Time on the Computer

School	Total Hours/Week	Average Hours/Week
A	>40	>6.7
B	10 - 20	5 - 10
C	10 - 20	2.9 - 5.7

The last three questions centered around the amount of computer and non-computer time spent using the system at three different times of the year. The three times were the months of September, March and June. The responses to these questions are summarized in table 14.

Table 14

Times Spent Using The Columbia System at Three Months of the Year

	Computer Time			Non-Computer Time		
Month	A	B	C	A	B	C
September	3-5	5-10	3-5	<3	>20	5-10
March	3-5	5-10	<3	<3	10-20	3-5
June	5-10	10-20	3-5	5-10	>20	10-20

SUCCESS OF THE IMPLEMENTATION PROCEDURE

Two questions attempted to ascertain the degree of success of the implementation process in the school. The first was a simple question to find out if there were any ongoing professional development sessions attended by the administrator(s) or clerical help during the current school year. All schools indicated

that there was no professional development program taking place for either the clerical staff or the administrators. The second question was rather complex in that the administrator had to indicate which administrative applications were computerized and to what degree on a three step scale of not at all, partially, or completely. The administrator also had to indicate, on the same scale, the degree to which they felt the computerization was successful. Table 15 summarizes the results of this question.

SATISFACTION WITH THE COLUMBIA SYSTEM

The following answers were given to the question "In general, how do you feel about the use of computers in your school?":

- Quicker and more efficient tracking of student progress
- Absolutely necessary! How did we function without them?
- Positive. It is viewed as a necessity.

It is obvious from the answers given, that the administrators were indeed very satisfied with the Columbia System and that the software not only did what it was supposed to do but did it very well. All the

Table 15

Amount of Computerization and the Degree of Success in Computerizing Particular Administrative Applications

	Degree of Computerization			Degree of Success in the Computerization		
Application	A	B	C	A	B	C
Attendance	C	C	C	C	C	C
Report Card	C	C	C	C	C	C
Student Scheduling	C	C	C	C	C	C
Correspondence	P	C	C	P	C	C
Student Gen. Records	P	C	C	C	C	C
Accounting Procedures	P	P	N	P	P	
Discipline Tracking	P			P		
Purchasing/ Budget Control		C			C	
Teacher Mark Management			P			C
Teacher Test Scoring			P			C
Teacher Test Preparation			P			C

N=not at all P=partially C=completely

administrators mentioned that when they found something they disliked about the system, it was usually corrected in the next updated version.

Chapter V

CONCLUSIONS

The three schools selected for the project were significantly different in terms of size (from 808 to 1250 students), type of programs (academic and vocational) and types of schedules (semestered and non-semestered). They also had a great deal in common in that they all have a similar types of student population and had essentially computerized the same administrative functions using the same program.

The Software

All three schools had implemented some components of the Columbia System. Student Scheduling, attendance and academic progress (report cards) were parts that were functioning in each school to date. It is apparent from this study, however, that the Columbia System could handle a variety of other administrative tasks such+

as: correspondence, general student records, teacher mark management, teacher test preparation and scoring, as well as budget control and purchasing tracking.

Prior to Automation

The procedure for collecting the evaluations made by teachers, and for writing out the report cards prior

to automation was variously described as time consuming, cumbersome and prone to clerical error. None of the schools were very satisfied with what they were doing and, no doubt, this was one of the main reasons the schools had decided to automate in the first place.

All the schools indicated that the procedures for keeping attendance records were difficult to manage. Two of the schools also felt that their method had been inaccurate and a lot of work for office staff. None of the schools felt that their system had been very good. One school commented that their system was time consuming for teachers and impossible to analyze.

All the schools indicated that their cumulative files were difficult to retrieve. Various schools mentioned other points regarding their cumulative files, but all the points mentioned were negative. No one felt that their files were updated and well kept or that the information they contained was useful and frequently used. Among the negative comments made were:

- files often had errors
- files were unreliable
- files contained useless information

- files were bulky and difficult to retrieve

In general student demographic data, past report cards, correspondence regarding the student, and medical records were kept in the file.

There was much less consistency among the three schools regarding the teachers' records that were kept. One school kept only demographic data that related to the teacher's job such as certification papers and academic background. Other schools kept material that was of a more personal or delicate nature such as evaluation reports and correspondence regarding the teacher. The schools have not automated this information except for the most basic of demographic data such as; names, addresses and phone numbers of the staff.

All the schools agreed that the method they previously used for scheduling was tedious and time consuming. One school even went so far as to classify the scheduling process as a frustrating experience. The Columbia System made this task much simpler and provided a better service to the students by examining many more non-conflicting options for a particular student's timetable than was humanly possible by the previous method.

There is little doubt that all of the above factors contributed to the decision to computerize. The feelings seemed to be that the procedures followed prior to automation were OK but that it was a lot of work and prone to errors. In general the administrators felt very strongly that the computer could do it better.

Implementation procedure

All three schools first put in the "attendance" module followed by the "academic progress" module. The order of implementation of the other modules varied but the "student scheduling" and "master builder" were next in order of priority. The "fee accounting" module seemed to be the least needed by schools in general since only one school actually implemented that module.

There was wide variation among the schools in the training process and also the time-on-computer for the clerical staff. There was, however, a relation between the amount of training received and the amount of time spent on the computer. The more training that the clerical staff got, the more time in front of the terminal(s) they spent. There was also a direct relation between the time-on-computer and the number of modules that were implemented. This number of modules

implemented may account for the amount of time spent learning and using the system.

The respective schools also had a pattern of administrator training similar to that of the clerical help. It was difficult to find a pattern in the use of the Columbia System by the administrators . An attempt at getting three "snap shots" in September March and June revealed that more computer and non-computer time was spent with the Columbia System in June than in the other months, but there did not seem to be any pattern among the schools. School B, that had been consistently in the middle in terms of clerical and administrative training and clerical use, was consistently highest in administrative use.

Degree of implementation

Three modules were completely and successfully implemented by the three schools. These were attendance, report card generation, and the student scheduling. Two other modules (correspondence and the general records of the student) were computerized successfully in two schools. One school did not feel that these two operations were completely computerized but they were more than three quarter done. Other operations were either only partially implemented or

not implemented at all. The administrators felt that the implementations that had been carried out were successful.

Satisfaction with the system

Because administrators indicated such a high degree of successful computerization (table 15), we can assume that the administrators must have felt a certain degree of satisfaction with the Columbia System. If they hadn't felt this satisfaction they probably would not have made the effort necessary to complete so many of the tasks successfully. However, there is always the possibility that they were successful in implementing the system but were not very happy with it for various reasons. Because of this, the more direct open-ended question was asked. The topic was also pursued in the personal interview conducted after the questionnaire was analyzed. When the administrators were asked the open ended question regarding how they felt about the administrative use of computers in their school, the answers were more than just positive. In fact the answers indicated a sense that the computer was almost a lifesaving device. There is no doubt that none of the schools would go back to their former non-

computerized system. The program definitely satisfied the present and anticipated future needs of the school.

RESEARCH IMPLICATIONS

The relatively small number of studies of Administrative Application of Computers in Schools suggests that the topic is rich in possible research areas. In terms of the office applications, a few areas needing investigation are:

- the quantity and quality of actual output
- psychological pressures and /or medical problems on the clerical staff as a result of using computers.
- stress level on teachers, clerical staff, or administrators during implementation process.
- changes in parent perception about the school as a result of automation
- increase in administrative effectiveness as a result of more comprehensive reports.
- teacher perception of the office automation system

- Student perception of the office automation system

- effect of office automation on student discipline

- cost effectiveness of automation

- has the computer changed the role of the administrator and,if so, in what way?

GENERAL RECOMMENDATIONS

While there were differences in the types of computers the three schools were using, the differences were more a question of speed rather than a fundamental difference in the type of equipment. Differences in internal memory or hard disk capacity as well as differences in the number of work stations really reflect the differences in school size.

The Columbia System is able to handle a school of 1250 students with ease, and hence, could probably handle a variety of school sizes up to at least 1900 students. While there are other programs available to the school administrator to automate his/her office, the Columbia System seems to satisfy most of the needs. The company seems to have a good working relation with

its customers. Administrators mentioned that virtually all of the things that they did not like about the program in the past have been corrected by the company in subsequent versions. Among a "wish list" mentioned for future improvements were:

- easier custom report generator
- cumulative labels after year end process
- assignment of advisors similar to homeroom assignments.

The administrators had found ways to get around these perceived shortcomings and considered them to be very mild compared to the great many strengths the program had.

Based on this study and the history and experiences at the three sites, there are a number of recommendations that one could make to an administrator who is contemplating automating his or her high school office with the Columbia System. Below is a list of recommendations broken down into two categories based on school size.

GENERAL RECOMMENDATIONS FOR SCHOOLS OF 500-900 STUDENTS

Recommendation 1

In general it would seem that a fundamental MS DOS machine with a 286 processor, 1 megabyte of memory on

board, and a hard disk with a capacity of 30-40 megabytes is quit sufficient for administrative purposes. It is recommended that two more basic computers such as PS2 model 25 IBM computers or their equivalent be installed as additional work stations.

Recommendation 2

A processing speed of 10-12 megahertz seems to be adequate for schools of this size.

Recommendation 3

The printer should have a speed in the range of 120 CPS. It should also be of a good quality to be able to withstand the tremendous amount of use it is likely to have.

Recommendation 4

Because of the vast amount of data that has to be entered, a scanner should be attached to the system if the attendance package is to be used.

GENERAL RECOMMENDATIONS FOR SCHOOLS OF 900-1900 STUDENTS

Recommendation 1

Schools with larger enrollment should purchase a 386 processor with perhaps 2 meg of memory on board and a hard drive with a larger capacity of 60-70 megabytes. With these computers as the heart of the system, one

can easily have much more basic computers such as PS2 model 25 IBM computers or their equivalent as work stations.

Recommendation 2

For a larger school a faster processor speed in the range of 16 megahertz or more is definitely recommended. Attempting to get by with less will only result in a great deal of frustration because on the length of time certain operations can take.

Recommendation 3

For larger schools a printer with a speed of 180 CPS or more is preferred.

Recommendation 4

Because of the vast amount of data that has to be entered, a scanner should be attached to the system if the attendance package is to be used. Anything less will doom it to failure

Beyond the recommendations based on this study, some further recommendations, due to the state of the present technology, are in order.

Recommendation 1

Tape backup systems should be an integral part of any computer system of this magnitude. A tape backup has always been the best method of making archival

copies, but developments in that technology have now also made it affordable.

Recommendation 2

The systems recommended above are meant to be minimum systems. One should get the fastest and latest technology available within one's budget. This would insure that a major investment of this type would satisfy computational needs for several years to come.

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Appendix A

SYSTEM 1: The Student Scheduling System

1.1: Student Records

- 1.1.01: Change Demographic Information
- 1.1.02: Course Selection
- 1.1.03: Delete Student
- 1.1.04: Enroll New Student
- 1.1.05: Enter/Withdraw Student
- 1.1.06: Name-to-Number Look-up
- 1.1.07: Timetable

1.2: Directories

- 1.2.01: Automatic Course selection Directory
- 1.2.02: City Directory
- 1.2.03: Course Directory
- 1.2.04: Course Relationship Directory
- 1.2.05: Course Type Directory
- 1.2.06: Department Directory
- 1.2.07: Division Directory
- 1.2.08: Entry Code Directory
- 1.2.09: Extended Demographic Data Dictionary
- 1.2.10: Global Alternate Directory
- 1.2.11: Grade Level Directory
- 1.2.12: Master Timetable
- 1.2.13: Meeting Code Directory

1.2.14: Room Directory

1.2.15: Relationship Directory

1.2.16: School Days Directory

1.2.17: School Parameters Directory

1.2.18: Semester Directory

1.2.19: Study Hall Directory

1.2.20: Teacher Directory

1.2.21: Timetable day Directory

1.2.22: Timetable format Directory

1.2.23: Timetable Period Directory

1.2.24: Title Directory

1.2.25: User Defined Directories

1.2.26: Withdrawal Code Directory

1.2.27: Year Directory

1.3: Reports

1.3.01: Directory Listings

1.3.02: Course Relationship Directory

1.3.03: Master Timetable

1.3.04: Automatic Course Conflicts

1.3.05: Course Tally

1.3.06: Potential Course Conflicts

1.3.07: Course Selections by Student

1.3.08: Course Lists

1.3.09: Course Load by Student

1.3.10: List of Free Rooms

1.3.11: List of Free Teachers

1.3.12: Room Timetables

1.3.13: Teachers Timetables

1.3.14: Student Timetables

1.3.15: Matrix Student Timetables

1.3.16: Course Selection Verification Slips

1.3.17: Students With Free Time

1.3.18: Class Lists

1.3.19: Division Lists

1.3.20: Alternates Used

1.3.21: Open Period Summary

1.3.22: Summary of Scheduling Results

1.3.23: Course Relationship Exceptions

1.3.24: Advisory Lists

1.3.25: Study Hall Lists

1.3.26: Cross Reference List

1.3.27: Enrollment Summary

1.3.28: Mailing Labels

1.3.29: Student Composite

1.3.30: Entry/withdrawal Summary

1.4: Student Scheduling process

a) A "difficulty code" is assigned to each student

b) The scheduler schedules higher grades level students first

c) The scheduler is capable of totally rescheduling a previously scheduled student if necessary in order to create a schedule for the current student

d) The scheduler schedules students as necessary to ensure optimum section balance within each course

e) The scheduler attempts to schedules primary course selections for all students before it uses any alternates

f) As the scheduler attempts to find a schedule for a particular student, it will try up to 100,000 different patterns.

1.5: Automatic Course selection Process

a) Create an Automatic Course Selection Directory

b) Enter Course Selection for all Students

1.5.01: Add

1.5.02: Change

1.5.03: Drop

1.5.04: Drop All

1.5.05: Next

1.5.06: Previous

1.6: Division Assignment Process

1.6.01: Add

1.6.02: Change

1.6.03: Delete

1.6.04: Division Assignment Information

1.7: Prepare to Schedule New Semester(s)

1.8: Prepare to Schedule New Year

SYSTEM 2: The Attendance System

2.1: Student Records

- 2.1.01: Change Demographic Information
- 2.1.02: Course Selection
- 2.1.03: Delete Student
- 2.1.04: Enroll New Student
- 2.1.05: Enter/Withdraw Student
- 2.1.06: Name-to-Number Look-up

2.2: Daily Attendance

- 2.2.01: Action Taken
- 2.2.02: Daily Attendance Input
- 2.2.03: Daily Attendance Profile
- 2.2.04: Daily Attendance Update
- 2.2.05: Daily Attendance Batch Input

2.3: Period Attendance

- 2.3.01: Action Taken
- 2.3.02: Period Attendance Input
- 2.3.03: Period Attendance Profile
- 2.3.04: Period Attendance Update
- 2.3.05: Period Attendance Batch Input

2.4: Directories

- 2.4.01: Action Taken Directory
- 2.4.02: Attendance Category Directory
- 2.4.03: Attendance Letter Directory

2.4.04: City Directory

2.4.05: Course Directory

2.4.06: Course Type Directory

2.4.07: Daily Attendance Parameters Directory

2.4.08: Department Directory

2.4.09: Division Directory

2.4.10: Entry Code Directory

2.4.11: Extended Demographic Data Dictionary

2.4.12: Grade Level Directory

2.4.13: Master Timetable

2.4.14: Meeting Code Directory

2.4.15: Period Attendance Parameter Directory

2.4.16: Reason Directory

2.4.17: Relationship Directory

2.4.18: Report Period Directory

2.4.19: Room Directory

2.4.20: School Days Directory

2.4.21: School Parameters Directory

2.4.22: Semester Directory

2.4.23: Teacher Directory

2.4.24: Timetable day Directory

2.4.25: Timetable format Directory

2.4.26: Timetable Period Directory

2.4.27: Title Directory

2.4.28: User Defined Directories

2.4.29: Withdrawal Code Directory

2.4.30: Year Directory

2.5: Reports

2.5.01: Daily Attendance Exceptions

2.5.02: Daily Absentee List

2.5.03: Daily Attendance Profiles

2.5.04: Print Daily Attendance Scan Forms

2.5.05: Attendance Letter

2.5.06: Attendance Summary

2.5.07: Period Attendance Exceptions

2.5.08: Period Absentee List

2.5.09: Period Attendance Profiles

2.5.10: Print Period Attendance Scan Forms

2.5.11: Period Attendance Analysis

2.5.12: Directory Listings

2.5.13: Master Timetable

2.5.14: Course Load by Student

2.5.15: Student Timetables

2.5.16: Matrix Student Timetables

2.5.17: Students With Free Time

2.5.18: Class Lists

2.5.19: Division Lists

2.5.20: Advisory Lists

2.5.21: Student Roster

2.5.22: Cross Reference List

2.5.23: Enrollment Summary

2.5.24: Mailing Labels

2.5.25: Student Composite

2.5.26: Entry/withdrawal Summary

2.6: Year end Process

a) Select the sorting orders for the report

b) Select attendance data (daily/period)

c) Decide if the dates are to be included

d) Decide if attendance data of all types is to be included

SYSTEM 3: The Academic Progress System

3.1: Student Records

- 3.1.01: Action Taken
- 3.1.02: Attendance Category
- 3.1.03: Change Demographic Information
- 3.1.04: Delete Student
- 3.1.05: Enroll New Student
- 3.1.06: Enter/Withdraw Student
- 3.1.07: Name-to-Number Look-up
- 3.1.08: Previous Credit/GPA Data
- 3.1.09: Previous Mark/Attendance Data
- 3.1.10: Timetable
- 3.1.11: Academic Progress Profile

3.2: Directories

- 3.2.01: Academic Progress Parameter Directory
- 3.2.02: Action Taken Directory
- 3.2.03: Attendance Category Directory
- 3.2.04: Average mark Directory
- 3.2.05: City Directory
- 3.2.06: Comment Directory
- 3.2.07: Course Directory
- 3.2.08: Course Type Directory
- 3.2.09: Department Directory
- 3.2.10: Division Directory

3.2.11: Entry Code Directory

3.2.12: Extended Demographic Data Dictionary

3.2.13: Final Mark Calculation Directory

3.2.14: Grade Level Directory

3.2.15: Mark Directory

3.2.16: Master Timetable

3.2.17: Meeting Code Directory

3.2.18: Relationship Directory

3.2.19: Room Directory

3.2.20: School Days Directory

3.2.21: School Parameters Directory

3.2.22: Semester Directory

3.2.23: Study Hall Directory

3.2.24: Teacher Directory

3.2.25: Timetable day Directory

3.2.26: Timetable format Directory

3.2.27: Timetable Period Directory

3.2.28: Title Directory

3.2.29: User Defined Directories

3.2.30: Withdrawal Code Directory

3.2.31: Year Directory

3.3: Reports

3.3.01: Attendance Summary

3.3.02: Directory Listings

3.3.03: Master Timetable

3.3.04: Course Load by Student

3.3.05: Student Timetables

3.3.06: Matrix Student Timetables

3.3.07: Students With Free Time

3.3.08: Class Lists

3.3.09: Division Lists

3.3.10: Advisory Lists

3.3.11: Study Hall Lists

3.3.12: Student Roster

3.3.13: GPA/Rank List

3.3.14: Cross Reference List

3.3.15: Enrollment Summary

3.3.16: Mailing Labels

3.3.17: Report Cards

3.3.18: Student transcript

3.3.19: Marks Gathering Forms

3.3.20: Attendance Gathering Forms

3.3.21: Honor roll

3.3.22: List of Students With Specified Marks

3.3.23: Comment Analysis

3.3.24: Marks Analysis

3.3.25: Transcript Labels

3.3.26: Student Composite

3.3.27: Entry/withdrawal Summary

3.3.28: Print Academic Progress I Scan Forms

3.3.29: Print Academic Progress II Scan Forms

3.3.30: Marks Edit List

3.4: Marks

3.4.01: Add

3.4.02: Change

3.4.03: Delete

3.4.04: Modify Course Type Information

3.5: Summary Daily Attendance

a) Enter Report Period

b) Enter Input Method (By Division/By Class)

c) Enter Course Number

3.5.01: Input

3.5.02: Change

3.5.03: Next

3.5.04: Previous

3.6: Student Ranking Process

3.7: Final Mark Calculation Process

3.7.01: Add

3.7.02: Change

SYSTEM 4: Utilities

4.1: Backup

4.2: Restore

4.3: Reorganize

4.4: System Component Authorization

4.5: User Security

The SUPER-USER is the primary user of the Security system and he/she assigns user ID and Passwords to other users. This SUPER USER also decides access restrictions for other users. The access can be a) Update b) Inquiry c) None d) Selective for any system and/or any category within the system.

SYSTEM 5: Optical Mark Input System

5.1: Read OMR forms and Update Data Base

5.2: Read OMR forms and Copy to Diskette

5.3: Read Diskette and Update Data Base

SYSTEM 6: File Builder

6.1: Build Student Data Files

- 6.1.01: Build Basic Demographic Data (add) File
- 6.1.02: Build Basic Demographic Data (change) File
- 6.1.03: Build Course Selections File
- 6.1.04: Build Daily Attendance (detailed) File
- 6.1.05: Build Daily Attendance (Summary) File
- 6.1.06: Build Emergency Data File
- 6.1.07: Build Entry/Withdrawal Data File
- 6.1.08: Build Extended Demographic Data File
- 6.1.09: Build Marks Data File
- 6.1.10: Build Parent Data File
- 6.1.11: Build Period Attendance (detailed) File
- 6.1.12: Build Residence Data File
- 6.1.13: Build Student Timetable (academic progress) File
- 6.1.14: Build Student Timetable (scheduling) File

6.2: Build Directory Files

- 6.2.01: Build Course Directory File
- 6.2.02: Build Master Timetable File
- 6.2.03: Build Room Directory File
- 6.2.04: Build Teacher Directory File

SYSTEM 7: Master Builder

7.1: Directories

- 7.1.01: Course Directory
- 7.1.02: Course Combination Directory
- 7.1.03: Course Meeting Directory
- 7.1.04: Meeting Code Directory
- 7.1.05: Potential Meeting Code Directory
- 7.1.06: Resource Directory
- 7.1.07: Room Directory
- 7.1.08: Teacher Directory

7.2: Master Timetable Build Process

a) Enter the semester for which the master Timetable is to be built

b) Enter the maximum number of course sections which may be selected for re-scheduling at any one time

c) Order course-sections
   1) Ascending by course priority
   2) Ascending by number of sections
   3) descending by number of semesters
   4) descending by number of days
   5) descending by number of periods
   6) descending by course tally

7.3: Reports

- 7.3.01: Directory Listings
- 7.3.02: Master Timetable
- 7.3.03: Course Placement by Resource

7.4: Teacher/Room Input

a) Enter Semester

b) Enter Resource code

c) All Courses with this resource code are printed

d) Enter Teacher

e) Enter Room

f) All Information is placed in the Master Timetable

APPENDIX B

PLEASE FILL IN THE BLANK OR CIRCLE THE APPROPRIATE ANSWER

A. SCHOOL DEMOGRAPHICS

1) NAME OF SCHOOL .....

2) ADDRESS .....

3) POSTAL CODE .....

4) WHAT GRADE LEVELS ARE TAUGHT IN THE SCHOOL?
(PLEASE CIRCLE) K 1 2 3 4 5 6 7 8 9 10 11 12

5) WHAT IS THE STUDENT POPULATION? .....

AS OF? ..... , 1989

7) IS THE SCHOOL ON A SEMESTERED SYSTEM? YES NO

8) HOW MANY DAYS ARE THERE IN YOUR SCHOOL CYCLE? .....

9) HOW MANY CLASS PERIODS ARE THERE IN A NORMAL SCHOOL DAY? .....

10) PLEASE FILL IN THE BOXES ON THE RIGHT HAND SIDE

	ACADEMIC	VOCATIONAL
a) NUMBER OF SECTIONS BEING OFFERED IN ANY ONE YEAR		
b) AVERAGE NUMBER OF CLASSES /TEACHERS/DAY		
c) NUMBER OF TEACHERS ON STAFF (EXCLUDING LIBRARIAN GUIDANCE, ADMIN.)		
d) AVE NUMBER OF CLASSES/DAY NORMALLY TAKEN BY AN ACADEMIC STUDENT		
d) AVE NUMBER OF CLASSES/DAY NORMALLY TAKEN BY A VOCATIONAL STUDENT		

B. PREVIOUS PROCEDURE

IN THIS SECTION ALL THE QUESTIONS REFER TO THE TIME IN YOUR SCHOOL PRIOR TO INSTALLING A COMPUTERIZED SYSTEM.

1) WHICH OF THE FOLLOWING STATEMENTS BEST DESCRIBE YOUR LEVEL OF SATISFACTION WITH THE PROCEDURE FOR COLLECTING THE EVALUATIONS MADE BY THE TEACHERS, AND FOR WRITING OUT THE REPORT CARDS. CHECK OFF ALL DESCRIPTIONS THAT APPLY.

_____ A) VERY SATISFACTORY
_____ B) FAIRLY GOOD BUT TIME CONSUMING
_____ C) FAIR BUT COSTLY
_____ D) CUMBERSOME FOR TEACHERS
_____ E) CUMBERSOME FOR OFFICE STAFF
_____ F) PRONE TO CLERICAL ERROR
_____ G) A DISASTER
_____ H) OTHERS
PLEASE SPECIFY_____

_____

2) WHICH STATEMENTS BELOW APPLY TO THE WAY ATTENDANCE RECORDS WERE KEPT. CHECK OFF ALL THAT APPLY.

_____ A) VERY GOOD
_____ B) TIME CONSUMING FOR TEACHERS
_____ C) INACCURATE
_____ D) NOT EFFECTIVE
_____ E) DIFFICULT TO MANAGE
_____ F) A LOT OF WORK FOR OFFICE STAFF
_____ G) OTHERS
PLEASE SPECIFY_____

_____

3) WHAT KIND OF DATA WERE KEPT IN THIS CUMULATIVE FILE? CHECK OFF ALL THAT APPLY.

_____ A) NO RECORDS WERE KEPT
_____ B) STUDENT DEMOGRAPHIC DATA
_____ C) TIMETABLE OF STUDENT
_____ D) PAST REPORT CARDS
_____ E) CORRESPONDENCE RE THE STUDENT
_____ F) MEDICAL RECORDS
_____ G) OTHERS
PLEASE SPECIFY_____

_____

B. PREVIOUS PROCEDURE (CONTINUED)

4) TYPICALLY STUDENT RECORDS WERE KEPT IN CUMULATIVE FILES. WHICH STATEMENTS DESCRIBE THE FILES YOUR SCHOOL KEPT? CHECK OFF ALL THAT APPLY.

_____ A) WE DID NOT HAVE CUMULATIVE FILES
_____ B) FILES WERE POORLY KEPT
_____ C) RECORDS ARE FREQUENTLY LOST
_____ D) FILES WERE STORED BUT NOT CHECKED OR USED
_____ E) FILES OFTEN HAD ERRORS
_____ F) FILES WERE UNRELIABLE
_____ G) FILES WERE UPDATED AND WELL KEPT
_____ H) FILES CONTAINED USELESS INFORMATION
_____ I) FILES WERE USEFUL AND FREQUENTLY USED
_____ J) FILES WERE DIFFICULT TO RETRIEVE
_____ K) OTHERS
PLEASE SPECIFY _____
_____

5) WHICH OF THE FOLLOWING TEACHER RECORDS WERE KEPT IN YOUR SCHOOL? CHECK OFF ANY THAT APPLY.

_____ A) NONE
_____ B) CERTIFICATION PAPERS
_____ C) ACADEMIC BACKGROUND
_____ D) MEDICAL RECORDS
_____ E) CORRESPONDENCE RE THE TEACHER
_____ F) PERSONAL OR DELICATE INFORMATION
_____ G) OTHERS
PLEASE SPECIFY_____

_____

6) IN TERMS OF SETTING UP THE TIMETABLE FOR TEACHERS AND STUDENTS, CHECK OFF THE STATEMENTS THAT DESCRIBE YOUR PROCEDURE

_____ A) A TEDIOUS AND TIME CONSUMING TASK
_____ B) A CHALLENGING TASK
_____ C) A FRUSTRATING EXPERIENCE
_____ D) A JOB THAT IS EAGERLY TACKLED
_____ E) A MINOR TASK IN THE OVERALL JOB DESCRIPTION
_____ F) OTHERS
PLEASE SPECIFY_____

_____

C. COMPUTER DEMOGRAPHICS

THE COMPUTER:

1) DESCRIBE THE COMPUTER USED FOR STORING INFORMATION.

MAKE _____ MODEL_____ PROC. SPEED_____ MHz.

2) WHAT SPECIAL FEATURES DOES THIS COMPUTER HAVE SUCH AS CO-PROCESSOR, TURBO BOARDS, ETC.?

_____

3) HOW MUCH RAM DOES THE COMPUTER HAVE? _____

4) DOES THE COMPUTER HAVE A HARD DISK? YES NO

5) IF YES, WHAT IS IT'S MAX. MEMORY CAPACITY?_____MB.

6) HOW MANY WORK STATIONS (INCLUDING HOST) ARE USED FOR ADMINISTRATIVE WORK? _____

7) HOW LONG HAVE YOU BEEN USING COMPUTERS IN YOUR OFFICE? _____ YRS

OTHER DEVICES

8) WHAT IS THE MAKE AND MODEL OF THE MAIN PRINTER YOU ARE CURRENTLY USING? _____

9) WHAT OTHER DEVICE(S) DO YOU HAVE ATTACHED TO THE COMPUTER? FOR WHAT PURPOSE?

a) DEVICE: _____

PURPOSE: _____

b) DEVICE: _____

PURPOSE: _____

c) DEVICE: _____

PURPOSE: _____

C. COMPUTER DEMOGRAPHICS (CONTINUED)

THE SOFTWARE:

10) WHICH VERSION OR RELEASE OF "THE SCHOOL SYSTEM" BY COLUMBIA SOFTWARE IS CURRENTLY BEING USED?

RELEASE #1 #2 #3 OTHER?_____

11) THE COLUMBIA SYSTEM CONTAINS SEVERAL MODULES. IN THE FIRST COLUMN PLEASE CHECK OFF THE MODULES YOU ARE PRESENTLY USING. IN THE SECOND COLUMN PLEASE RANK THE ONES YOU ARE USING BY CHRONOLOGICAL ORDER OF IMPLEMENTATION.

	USING	RANK
a) FEE ACCOUNTING	_____	_____
b) STUDENT SCHEDULING	_____	_____
c) MASTER BUILDER	_____	_____
d) ATTENDANCE	_____	_____
e) ACADEMIC PROGRESS	_____	_____

THE STAFF USE:

12) HOW MANY CLERKS DO YOU HAVE WORKING ON THE OFFICE SYSTEM?_____

13) HOW MUCH TRAINING IN USING THE COLUMBIA SYSTEM DO YOU ESTIMATE YOUR CLERICAL STAFF HAS HAD? (NOTE THIS WOULD BE TOTAL PERSON-DAYS OF TRAINING FOR ALL YOUR CLERICAL STAFF USING THE OFFICE SYSTEM)

_____ A) LESS THAN 5 DAY

_____ B) BETWEEN 5-10 DAYS

_____ C) BETWEEN 10-20 DAYS

_____ D) BETWEEN 20-30 DAYS

_____ E) MORE THAN 30 DAYS

C. COMPUTER DEMOGRAPHICS (CONTINUED)

14) HOW MUCH TOTAL TIME DO YOU ESTIMATE YOUR CLERICAL STAFF SPEND USING THE SYSTEM?

_____ A) LESS THAN 10 HOURS PER WEEK

_____ B) BETWEEN 10-20 HOURS PER WEEK

_____ C) BETWEEN 20-30 HOURS PER WEEK

_____ D) BETWEEN 30-40 HOURS PER WEEK

_____ E) MORE THAN 40 HOURS PER WEEK

15) HOW MANY ADMINISTRATORS ACCESS TCS?_____

16) HOW MUCH FORMAL TRAINING (IN TOTAL PERSON/DAYS) DO YOU ESTIMATE YOU AND OTHER ADMINISTRATIVE STAFF HAVE HAD? (NOTE THIS WOULD BE TOTAL TRAINING OF ALL THE ADMINISTRATIVE STAFF USING THE OFFICE SYSTEM)

_____ A) LESS THAN 5 PERSON/DAYS

_____ B) BETWEEN 5-10 PERSON/DAYS

_____ C) BETWEEN 10-20 PERSON/DAYS

_____ D) BETWEEN 20-30 PERSON/DAYS

_____ E) MORE THAN 30 PERSON/DAYS

17) HOW MUCH TOTAL COMPUTER TIME AND NON-COMPUTER TIME DO YOU ESTIMATE THE ADMINISTRATORS SPEND USING THE SYSTEM DURING THE MONTH OF SEPTEMBER? (INDICATE AN AVERAGE # OF HOURS/WEEK)

COMPUTER TIME		NON-COMPUTER TIME
_____	LESS THAN 3 HOURS PER WEEK	_____
_____	BETWEEN 3-5 HOURS PER WEEK	_____
_____	BETWEEN 5-10 HOURS PER WEEK	_____
_____	BETWEEN 10-20 HOURS PER WK	_____
_____	MORE THAN 20 HOURS PER WEEK	_____

C. COMPUTE DEMOGRAPHICS (CONTINUED)

18) HOW MUCH TOTAL COMPUTER TIME AND NON-COMPUTER TIME DO YOU ESTIMATE THE ADMINISTRATORS SPEND USING THE SYSTEM DURING THE MONTH OF MARCH? (INDICATE AN AVERAGE # OF HOURS/WEEK)

COMPUTER TIME		NON-COMPUTER TIME
_____	LESS THAN 3 HOURS PER WEEK	_____
_____	BETWEEN 3-5 HOURS PER WEEK	_____
_____	BETWEEN 5-10 HOURS PER WEEK	_____
_____	BETWEEN 10-20 HOURS PER WK	_____
_____	MORE THAN 20 HOURS PER WEEK	_____

19) HOW MUCH TOTAL COMPUTER TIME AND NON-COMPUTER TIME DO YOU ESTIMATE THE ADMINISTRATORS SPEND USING THE SYSTEM DURING THE MONTH OF JUNE? (INDICATE AN AVERAGE # OF HOURS/WEEK)

COMPUTER TIME		NON-COMPUTER TIME
_____	LESS THAN 3 HOURS PER WEEK	_____
_____	BETWEEN 3-5 HOURS PER WEEK	_____
_____	BETWEEN 5-10 HOURS PER WEEK	_____
_____	BETWEEN 10-20 HOURS PER WK	_____
_____	MORE THAN 20 HOURS PER WEEK	_____

D) COMMENTS AND CONCLUSIONS

1) ARE THERE CURRENTLY (WITHIN THIS SCHOOL YEAR) ANY ONGOING PROFESSIONAL DEVELOPMENT TRAINING SESSIONS ATTENDED BY;

   a) ADMINISTRATOR(S) Y N

      IF YES, WHAT KIND? .....

   b) CLERICAL STAFF(S) Y N

      IF YES, WHAT KIND? .....

2) FOR THE FOLLOWING QUESTIONS PLEASE INDICATE YOUR ANSWER BY CIRCLING THE APPROPRIATE LETTER IN EACH OF THE COLUMNS BELOW.

	COLUMN A IF YOU HAVE COMPUTERIZED ANY OF THE FOLLOWING ADMIN. APPLICATIONS, CIRCLE THE DEGREE OF COMPUTERIZATION. N= NOT AT ALL P= PARTIALLY C= COMPLETELY A COMPUTERIZED			COLUMN B CIRCLE TO WHAT DEGREE YOU FEEL THE COMPUTERIZATION WAS SUCCESSFUL. N= NOT AT ALL P= PARTIALLY C= COMPLETELY B DEGREE OF SUCCESS		
A) ACCOUNTING PROC.	N	P	C	N	P	C
B) STUDENT SCHEDULING	N	P	C	N	P	C
C) STUDENT GEN. RECORDS	N	P	C	N	P	C
D) ATTENDANCE	N	P	C	N	P	C
E) REPORT CARDS	N	P	C	N	P	C
F) CORRESPONDENCE	N	P	C	N	P	C
G) OTHERS(SPECIFY)						
_____	N	P	C	N	P	C
_____	N	P	C	N	P	C

D. COMMENTS AND CONCLUSIONS (CONTINUED)

3) IN GENERAL, HOW DO YOU FEEL ABOUT THE USE OF COMPUTERS IN YOUR SCHOOL?