Matchmaker plus: Information management tool at a classroom level

Barry J. Hadley

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MATCHMAKER PLUS: INFORMATION MANAGEMENT

TOOL AT A CLASSROOM LEVEL

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education: (Instructional Technology Option)

by
Barry J. Hadley
June 1995
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June 1995

Approved by:

Dr. Rowena Santiago, First Reader

Mr. Sylvester Robertson, Second Reader

Date 4/18/95
Society has entered an age where information systems are playing a major role in processing an assortment of data. In elementary schools, office staff and teachers routinely obtain, store, retrieve, and manipulate data concerning students. The office staff and teachers have the responsibility to manage informational needs in a timely and useful manner. Advancements in technology are playing an important role in helping them meet this responsibility.

Traditionally, information systems technology in elementary schools are developed at the school office level using computers. Unlike the office staff, which uses computers, most of the data collected by teachers is done manually and stored in filing cabinets, stenographer booklets, baskets, desk drawers, and brief cases. When information is needed, the teacher must search through an array of paper sources to find the appropriate data. Generally, this method of collecting, storing, and retrieving data is not efficient or effective for managing information at the classroom level.

This project will show how a computer-based information management system can be used by elementary school teachers. Using a desktop database manager software, FileMaker Pro, this project will describe how technology can help a classroom teacher manage information through an application model.

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called MatchMaker Plus. MatchMaker Plus matches student absences with missed lesson activities; summarizes the matched data by individuals or by class; and, generates summary reports by day, week, or month.

Included in this project is a design process that describes some of the steps necessary in developing MatchMaker Plus. Finally, this project provides a working classroom information system model that demonstrates quick access to information related to improving the correlation between student absenteeism and lesson or unit activities.
ACKNOWLEDGMENTS

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CHAPTER ONE

INTRODUCTION

Society has entered an information age and information is proliferating at a rapid rate. Information systems are playing a major role in the process of gathering, accessing, and manipulating data. Data is converted into productive and meaningful information at all levels of society.

In elementary schools, a variety of people in the school office and teachers in the classroom routinely obtain, store, retrieve, and manipulate data. The school office primarily concentrates on the demographics and academic records of the students, while teachers in the classroom customarily focus on their instructional and non-instructional tasks. It is the responsibility of the office staff and the classroom teacher to manage their informational needs in a timely and useful manner. Advancements in technology are playing an important role in helping them meet this responsibility. "Various technologies have been used to organize and, most importantly, to provide access to information. And, it is common now for individuals to utilize new access means and modes to obtain information" (Kazlauskas & Iehl, 1993).

Traditionally, information systems technology in elementary schools are developed at the school office level using computers. Information management at the school office
is designed to be comprehensive and capable of handling large volumes of data. The basic components of this computer-based information system are people, procedures, databases, hardware, and software. The methodology for entering, maintaining, and retrieving data is usually performed by office personnel via computer terminal screens. Data is stored in computer databases that are composed of fields, records, and files.

A notable capability of a computer database is the flexibility provided by the fields. By manipulating the fields, office personnel can effortlessly search a database in many different ways to examine student information. Also, stored data can be easily managed to generate an assortment of pertinent reports and summaries. These reports and summaries contain information such as student demographics, disciplinary actions, student attendance, mark reporting, and student schedules.

At the classroom level, teachers also manipulate large amounts of data for informational purposes. Data concerning numerous class events is retained and used in various formats throughout the school year. Teachers manage data on such items as lesson plans, student and parent contacts, homework and test scores, grades, cumulative and achievement folders, portfolios, and intervention documents. Unlike the office staff, which uses computers, most of the data collected by teachers is done manually and stored in filing cabinets,
stenographer booklets, baskets, desk drawers, and brief cases. When information is needed, the teacher must search through an array of paper sources to find the appropriate data. Generally, this method of collecting, storing, and retrieving data is not efficient or effective for managing information at the classroom level. Furthermore, this process of manipulating data in a manual system is very time consuming.

Typically, at the classroom level, data is not linked together for easy references. Searching out and gaining access to specific data elements sometime proves to be tedious and inept. According to Burbach (1989), information is the lifeblood of any successful organization and the traditional means of gathering and processing information is not sufficient in keeping the user abreast in an increasingly resourceful organization. Information required to meet the needs of the user are often gathered by hand and maintained in cumbersome, non-integrated systems.

This author observed that information systems technology at the school office level is well-established, while information systems technology at the classroom level seems almost non-existent. There seems to be a need to develop comprehensive computer-based information systems at the classroom level that are just as comprehensive as information systems at the office level. With appropriate training, hardware, and software requirements, teachers can meet the
needs of the information age with computer-based information systems at the classroom level. It is not inappropriate to assume that the use of information systems in the classroom can be on the same technological level as the information systems in the school office.

What teachers need at the classroom level is a way to manage their data more effectively. They need an integrated information management system that can link all vital data together in a comprehensive, reliable, and timely manner. One effective way is to implement technology that will enhance the data manipulation functions of the classroom teacher.

Like office level information systems, classroom level information systems can utilize the technological advances in computer hardware and software. At the classroom level, data from the instructional and non-instructional tasks can be maintained on computer databases by the classroom teacher. Used appropriately, computer-based information systems can help teachers be better data managers. A computer database is a powerful management tool that can give the classroom teacher a well-defined methodology for effectively collecting, organizing, and manipulating data.

Computer use at the classroom level was never intended to replace good teaching but rather to supplement and facilitate what good teachers can do (Sudzina, 1993). At the classroom level, the purpose of a computer-based information
system is to empower the teacher with an integrated, time
saving, and cost effective approach to managing data. A
classroom level computer-based information system is useful
in supporting strategic classroom planning, meeting school
administrators' performance expectations, and integrating key
facts into the curriculum.

Project Overview

The purpose of this project is to design and develop a
computer-based information management system that can be used
by elementary school teachers at the classroom level. Of the
various instructional and non-instructional tasks done in and
out of the classroom, it was data concerning student absence
and missed lesson activities that were identified for
conversion to a computer-based information management system.
Using a desktop database manager software, FileMaker\textsuperscript{(R)} Pro,
this project will demonstrate how technology can help a
classroom teacher manage information through MatchMaker Plus.
MatchMaker Plus is a computer-based tool for information
management at the classroom level. MatchMaker Plus matches
student absences with missed lesson activities; summarizes
the matched data by individuals or by class; and, generates
summary reports by day, week, or month. This project will
also describe the design process that was used to develop
MatchMaker Plus.
Operational Definitions

For this paper, data is defined as the language, mathematical or other symbolic surrogates, which is generally agreed upon to represent people, objects, events, and concepts. Data is stored in a computer database and is processed in some way to form information. A computer database is composed of fields, records, and files. A field is the smallest unit of data. A record is a group of fields. A file is a collection of records of one or more record types. Information is the result of modeling, formatting, organizing, or converting data in a way that increases the level of knowledge for its recipient.

Information systems are an assemblage or collection of people, machines, ideas, and activities that gather and process data in a manner that will meet the formal information requirements of an organization. Burch, Strater, & Grudnitski (1979) identified several attributes of information systems. Some of the attributes and their meaning are:

1. Accessibility is the ease and speed with which information can be obtained.
2. Accuracy is the degree of freedom from error.
3. Appropriateness is how well the information relates to a user’s request.
4. **Timeliness** is the elapsed time of the cycle: input, processing, output.

5. **Clarity** is the degree of freedom from ambiguity.

6. **Flexibility** is the adaptability of use by more than one user.

7. **Verifiability** is the degree of consensus arrived at among various users examining the same information.

8. **Freedom from bias** means the absence of intent to alter or modify information in order to influence recipients toward reaching one particular conclusion.

**Instructional tasks**, carried out in the classroom, are activities such as developing specific lesson plans, organizing presentations of the lessons, evaluating what the students have learned, and classroom management. Instructional tasks are usually performed between normal school hours, 180 days a year. **Non-instructional tasks** are mostly paperwork activities that support the instructional tasks. Non-instructional tasks are performed anytime and include grading papers, contacting parents, and maintaining a variety of records with student related information.

**FileMaker**

**(R)** **Pro 2.0** is a database manager system from Claris Corporation. It is designed to help manage information easily and effectively. A **FileMaker**

**(R)** **Pro database** is a file made up of related records.
**MatchMaker Plus** is a computer-based information system that addresses the relationship between the activities of a lesson and the absenteeism of students. It is intended for the exclusive use of elementary school teachers at the classroom level.

**Layout** is a way of entering and viewing data in a FileMaker(R) Pro database. MatchMaker Plus uses an assortment of layouts that enable teachers to view, add, change, and delete data in a FileMaker(R) Pro database.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter will examine the role and impact of technology on elementary school teachers. It will look at classroom technology applications and the preparation of teachers in using technology in the classroom. This chapter will also examine the elementary school teachers as information managers. One problem encountered during the literature review was that there was a limited amount of primary sources on information systems at the classroom level. However, there were plenty of secondary literature that examined technologies used in classroom.

Computers: The New Classroom Technology

Establishing a computer-based information system in the classroom is not an easy task for elementary school teachers. Traditionally, the academic establishment has opposed technology in the classroom. Since the turn of the 20th century, technologies such as magic lantern, stereoscope, film, radio, television, and a range of other media have tried to make an enduring impact on education, but failed. In 1966, Harold Howell II, President Lyndon Johnson's commissioner of education, felt that technology had a limited role in schools. He stated, "The essence of education is
Beyond the capacity of a machine, and always will be" (Snider, 1992). As late as 1986, former U.S. Secretary of Education William Bennett also agreed on the limitations of technology in school. He stated, "The good schools know what works; they scorn fads and insist on fundamentals" (Snider, 1992). For most of the 20th century, lectures, recitation, and seatwork have been and remained the dominant forms of student activities in the classroom.

More recently, the computer and an array of multimedia peripherals have demonstrated great potential as technical tools for the classroom teacher. With the advancements made in personal computer technologies, elementary school teachers are encouraged to incorporate computer applications. Some useful applications are: word processors, databases, graphic programs, and many computer-assisted instruction (CAI) packages.

Unlike earlier machines that have entered the classroom, the computer is believed to be more than just another machine. Snider (1992) cited Alfred Bork and others who described the role of the computer in the classroom as an instrument of a major revolution in education. They added that the one move computers have made in the direction of this major revolution is that the computer is no longer a novelty. Hannafin and Savenye (1993) point out that teachers have a new role when using technology. "Teaching with a computer requires not only a degree of technical proficiently
but also the acceptance of a decidedly different role" (Hannafin & Savenye, 1993).

The Preparation Of Teachers Using Technology In The Classroom

Hannafin and Savenye (1993) asked if the computer was just another failed innovation. In their answer, they pointed out that the computer had a better chance of survival than its predecessors because of the general acceptance in society. "Computers have permeated almost every facet of our business and personal lives" (Hannafin & Savenye, 1993). The authors felt that this general acceptance should ensure that schools prepare their graduates for a world that demands computer literacy. They pointed out that computer literacy of teachers, though improving, is not widespread. Many teachers do not use the computer regularly and creatively. Hannafin and Savenye gave some reasons that might offer an explanation for some teachers possible resistance to using computers. Some reasons given were:

1. Frustration in learning how to use the computer.
2. Some teachers do not believe that the computer improves learning outcomes.
3. Some teachers believe the computer can become a mental crutch for some students.
4. Some teachers resent the computer because they see it as a competitor for students' attention.
5. Some teachers cite the risk of bucking an non-supportive administrator.

Teachers need to be taught how to use technology in education by using technology themselves either when taking courses to become teachers, by taking computer literacy courses, or by in-services. In order to be proficient with technology, a comfort level must first be established within the teachers. Teachers need to be prepared not only for using a computer for instructional tasks but also to help them do information management. Computer literacy can give teachers a comfort level in their use of databases, electronic mail systems, CD-ROM encyclopedias, multimedia, and information systems. There is a professional goal for teachers who use technology as moving deliberately beyond adoption, toward adaptation, and then appropriation (Dyrli and Kinnaman, 1994).

Munday, Windham, & Stamper (1991) cited the American Association of Colleges of Teacher Education in identifying 10 critical considerations that must be recognized if educators are to receive needed information in electronic and communications technologies:

1. Information technology in schools is not a passing fancy.

2. Information technologies encompass a variety of equipment and applications in addition to computers.
3. Information technology is a critical resource in the effective delivery of instruction.

4. Information technologies are a means rather than an end in the educational process.

5. The use of information technologies is an important component in the training of all professional educators.

6. Specialists in educational technologies are needed for both school and non-school settings.

7. The leadership of deans is critical to the successful implementation of information technologies.

8. SCDEs (State Colleges and Departments of Education) must exert leadership in research and development activities related to educational technologies.

9. Colleges of education should play a major role in efforts to achieve equity in the access to new technologies.

10. Colleges of education administrations and faculty have the responsibility to inform themselves about the new products which have educational implications.

Most computer-literacy teacher programs include examining the use of word processing, databases, spreadsheet applications, and computer-aided instructional software evaluation. Elementary school classrooms are being equipped with computers, printers, scanners, laser disks and videotape players, modems, CD-ROM drives, and hundreds of software titles to meet the needs of the classroom. However, applications for information management are seldom used by
the teacher at the classroom level. Teachers need opportunities to see how various software applications can assist them in developing instructional materials, maintaining critical information, reporting grades and achievements, and communicating with parents, community, or school administrators.

Classroom Technology Applications

By being creative with the computer technology that is available for the classroom use, teachers can implement computer-based information systems at the classroom level. Dyrli and Kinnaman (1994) put classroom technology applications into four categories:

1. As objects of instruction,
2. Manager of instruction,
3. Delivery medium for instruction
4. Instructional tools.

As objects of instruction, the technological focus is on the software and hardware with emphasize put on computer programming. As a manager of instruction, technology is used to test students, diagnose learning deficiencies, and remedial evaluations. As a delivery medium for curriculum instruction, technology has many applications. Some delivery medium applications sighted by Dyrli and Kinnaman are drill and practice, tutorials, demonstrations, simulations, problem-solving, and educational games. As an instructional
tool, technology is used to accomplish specific tasks, such as making statistical calculations, graphing survey results, writing songs, drawing pictures, or using computer-linked probes to gather scientific data in microcomputer-based laboratories (MBLs). The most common instructional tool applications are word processors, databases, spreadsheets, and graphics programs.

With the application of a microcomputer database application software, a computer-based information system can be developed and used at the classroom level. In this project, MatchMaker Plus falls in the category of a manager of instruction application. MatchMaker Plus aids the teacher in diagnosing and evaluating students' learning deficiencies. With MatchMaker Plus, the teacher can get an explicit understanding of the relationship between instructions taught and the absenteeism of the students. "To date, managing instruction continues to be the least developed of the four major application areas" (Dyrli and Kinnaman, 1994).

The Role of Elementary School Teachers as Information Managers

Elementary school teachers are expected to be more than just instructors of a curriculum. They are expected to be the manager, the decision maker, and the organizer of their classroom. They must plan their daily activities so that their classroom time will be used for teaching rather than
doing clerical work. At the same time, they must plan their clerical work so that it does not interfere with their personal time. According to Huston, Clift, Freiberg, & Warner (1988) a teacher's responsibilities include the management of time, the planning and implementation of classroom learning environments, and the facilitation of positive social interactions between students. Teachers are constantly monitoring, through gathered information, the effects of their teaching to assess the relationships between what they intended and what the students actually experience. For most elementary school teachers it is essential for them to keep a multitude of information at the classroom level while working tremendously long hours in and out of school.

Typically, the school environment determines the amount and type of instructional and non-instructional information retained by an elementary school teacher. However, curriculum content and assigned duties also impact the informational needs of the teacher. For many teachers, teaching does not end when the final bell rings or on the last day of the school year. They have ongoing activities, some of which are: materials to create, papers to grade, lessons to plan, and progress reports to write. Creating and maintaining necessary school information on a daily, weekly, and monthly basis is very time consuming. Also, much time is spent in the summer or off-track months preparing ahead for the next school year or track.
The elementary school curriculum generally includes science, mathematics, spelling, reading, language, handwriting, social studies, art, music, and physical education. Within the instructional framework, teachers must keep information on the progress of each student in these subjects.

Elementary school teachers are frequently assigned to extracurricular activities such as sponsoring clubs, committees, coaching sports, or working in the performing arts. These non-instructional activities usually require the teacher to maintain information on the group's activities and the participants involved.

Trimble (1986) described teachers as supervisors who make many evaluative decisions concerning students, curriculum, classroom organization, and interpersonal relationships. The average elementary teacher has in their charge perhaps thirty people. In the business sector, this means a top-salary, prestigious job. For teachers, it means thirty different student cases, problems, and ability levels. In most cases, information plays an important role in a teacher's decision making process. There is a direct relationship between the quality of their decisions and the information that is available to them. According to Trimble, teachers must organize themselves against precarious situations. He noted that disorganized teachers are
susceptible to embarrassing occasions. Examples of embarrassing occasions pointed out by Trimble are:

1. A student saying an assignment was turned in and the teacher has no record of it.

2. A parent complains that the teacher would send home a test review sheet and the teacher forgot.

3. The vice-principal calls, asking about a three-copy student roster and the teacher claim to have given it to a secretary two days ago.

Trimble suggests that teachers organize their data to avoid such dilemmas. As supervisors of their classroom, teachers must have a practical system that allow them to store, retrieve, and translate a variety of data into useful information.

Most teachers have some sort of record keeping system that they feel would be responsive to the needs of the classroom environment. Generally, the record keeping systems are manual and do not use computers. Teachers use file folders, stenographer booklets, file card boxes and so on to manipulate the data to provide useful information at the classroom level. A manual system does not lend itself easily to flexibility, either in terms of solving a given problem, or in its application of related situations. Manual systems require a lot of time to update, sort, and present the information. Paper or card stored files are rarely, if ever, duplicated, and can easily be lost or destroyed. Some vital
classroom data kept by teachers are student, grade book, parent contact, lesson planner, and classroom organization data. Figure 1 lists some of the properties of classroom data.

1. Student data consists of a variety of items: student identification numbers, homeroom, telephone numbers, grades, etc. Teachers have many uses for the data, such as providing student information to the school office, counselors, or the health nurse. The data can also be used in completing required pre-printed school forms. In a manual system, this data is usually stored in folders, booklets, card boxes, or other seemingly convenient locations. In most cases, manipulation of data such as updates, look ups, retrievals, and accumulations of related data can be time consuming.

2. Grade book data consist of student names, school days in a marking period, grades, homework and test scores, absences, and remarks. Most grade book systems require calculations and evaluation of data to derive at a valid grade. In a manual system, this data is usually entered in booklets that can become cumbersome as the school year progresses. Also, calculations are usually done using a pocket calculator and can be time consuming.

3. Parent-contact data consists of student's name, address, telephone number, parents names, dates, and comments. The data is used in creating parent-contact logs
**1) Student Data:**

<table>
<thead>
<tr>
<th>Student name</th>
<th>Birthdate</th>
<th>Parent/emergency:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>Enrollment date</td>
<td>Father/Mother</td>
</tr>
<tr>
<td>Sex</td>
<td>Ethnic</td>
<td>Work Phone</td>
</tr>
<tr>
<td>Student number</td>
<td>Dominant language</td>
<td>Emergency contact</td>
</tr>
<tr>
<td>Track</td>
<td>Home language</td>
<td>Health Data</td>
</tr>
<tr>
<td>Home room</td>
<td>Residence relations:</td>
<td></td>
</tr>
<tr>
<td>Seat number</td>
<td>Parents</td>
<td>Citizenship award</td>
</tr>
<tr>
<td>Home phone</td>
<td>Mother</td>
<td>Lunch</td>
</tr>
<tr>
<td>Home address</td>
<td>Father</td>
<td>Previous School(s)</td>
</tr>
<tr>
<td>City and Zip</td>
<td>Grandparents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aunt</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foster parents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**2) Grade Book Data:**

<table>
<thead>
<tr>
<th>Student name</th>
<th>Marking period</th>
<th>Homeaddress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marking grade</td>
<td>Home phone</td>
<td>Parents/Guardian name</td>
</tr>
<tr>
<td>Home work grade</td>
<td>Home phone</td>
<td>Date of contact</td>
</tr>
<tr>
<td>Test scores</td>
<td>Comments</td>
<td>Date of contact</td>
</tr>
<tr>
<td>Absences</td>
<td>Tardies</td>
<td>Comments</td>
</tr>
<tr>
<td>Remarks</td>
<td>Remarks</td>
<td></td>
</tr>
</tbody>
</table>

**3) Parent-Contact Data:**

<table>
<thead>
<tr>
<th>Student name</th>
<th>Home address</th>
<th>Home phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home phone</td>
<td>Parents/Guardian name</td>
<td>Date of contact</td>
</tr>
<tr>
<td>City and Zip</td>
<td>Foster parents</td>
<td>Comments</td>
</tr>
<tr>
<td>Residence relations:</td>
<td>Emergency contact</td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>Foster parents</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>Foster parents</td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>Foster parents</td>
<td></td>
</tr>
<tr>
<td>Grandparents</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Aunt</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Foster parents</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**4) Planner Data:**

<table>
<thead>
<tr>
<th>Lesson Plans:</th>
<th>Subject matter</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Teacher Editions</td>
<td>Kits</td>
<td></td>
</tr>
<tr>
<td>Magazine articles</td>
<td>Ideas</td>
<td></td>
</tr>
<tr>
<td>Book reviews</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**5) Classroom Organization Data:**

<table>
<thead>
<tr>
<th>Announcements</th>
<th>Special event dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulletins</td>
<td>Guidance news</td>
</tr>
<tr>
<td>Anecdotes</td>
<td>Humorous cartoons</td>
</tr>
</tbody>
</table>

Figure 1. Typical classroom data retained by an elementary school teacher.

and is stored as a record of communication between the teacher and parents. This information is also useful in preparing grade books, being responsive to challenging
parents, and administrative needs. Data is usually recorded in booklets, index cards, or spontaneous slips of paper. In a manual system, this data requires time consuming manipulation in order to maintain accuracy of total recall.

4. Planner data is usually for a teacher's instructional use. Lesson plans objectives, homework assignments, boardwork, and dates of when a unit will be taught are recorded in the planner. The planner is a working document that is not formal, but can be used as vital input into a formal lesson plan format and other administrative uses. In a manual system, this data is usually kept in a planner, or notebook that requires a lot of paper. Retrieval of what lesson activities were performed can be cumbersome. For example, daily lesson activities are derived from the planner and describe the activities the students will do during the teaching of a lesson or unit. If a teacher has to recall what activities were missed when a student fails to attend a day of school, linking the data from the planner to the day of absence can be time consuming.

5. Classroom organization data consists of homework assignments and announcement boards. Homework assignment data consists of due dates and validation of work submitted and completed. Announcement board data is subject to frequent changes and is made up of school and community event notices, bulletins, guidance news, humorous cartoons, anecdotes, photos, etc. In a manual system, this data is
recorded and posted for students, parents, substitute teachers, and school personnel.

How can elementary school teachers become better information managers at the classroom level? As information managers with instructional and non-instructional informational demands, teachers need to expand the scope of the classroom computer. When used to its full potential, a computer is more than a machine for drills, word processors, and remedial work. With appropriate preparations, teachers can use computers as an innovative tool for defining, storing, retrieving, manipulating, and displaying information.

Developing a Computer-Based Classroom Level Information System

The premise of computer-based classroom level information systems is to process the data that is kept by teachers in a concise and meaningful manner. If a computer-based system is to be proposed or implemented it is necessary to consider the extent of such a system, or, perhaps more importantly, decide the restrictions to be placed on the development (Butcher, 1985). At the classroom level, the teacher should make the decision as to the direction classroom information systems development will take. Lucus (1976) strongly recommend that users of information systems be active participants in the design of their own systems and
actually do some of the tasks normally carried out by a system analyst. A system analyst is a person that determines the requirements, specify alternatives, design the components of the system, and manage the systems implementation. Through careful considerations and with the aid of reliable database management software, elementary school teachers can participate in developing and managing viable computer-based information systems at the classroom level.

If a teacher is to be successful in developing their own classroom level information systems they must have guidelines to follow. No matter what an information systems' size and complexity, it will require many coordinated activities. Burch, Strater, & Grudnitski (1979) described systems development methodology as being in five phases: system analysis, general systems design, systems evaluation and justification, detail systems design, and systems implementation.

1. The system analysis phase consists of the definition of users problems/needs, systems scope, gathering and analyzing of study facts. Some possible reasons for the initiation of systems analysis are solving a problem, taking care of a new requirement imposed upon the organization, implementing a new method, technique, or idea, or making a general system improvement.

2. The general systems design phase entails the bringing together of separate elements into a viable whole
and illustrating how something purposeful can be accomplished. Basic steps in the design process include: definition of systems objectives, development of conceptual design models, and application of organization constraints. The general systems design requirements will dictate what kind of system is finally implemented. Design alternatives include: do nothing (no change), systems modification, and a new systems design.

3. The systems evaluation and justification phase play a major role in determining what equipment will be purchased to implement a system. Vendors are evaluated on the basis of imperatives. Four methods of acquiring a computer configuration are rent, purchase, lease, and a combination of the preceding. Management selects a particular method based on advantages applicable to the organization. The major consideration as to whether or not an organization acquires a computer configuration, or undertakes any project, should be stated in cost/effectiveness terms. If the effectiveness of a proposed system sufficiently outweighs costs of that system, then it is likely that the proposed system will be implemented.

4. The detail systems design phase transforms a general or conceptual design into a unified system of people and machines that collects and processes data and produces information. An important part of the overall design of an information system is the establishment of effective
controls. Processing controls can be categorized as input controls, programming controls, database controls, output controls, and hardware controls. Security, another form of control, must also be considered. Some security considerations are access to data files, access to physical component, transmission intervention, and software disruption. Another part of detail systems design is the design of all forms and reports required in the information system. Forms can be categorized as input, output (reports), and turnaround documents. To design effective and economical forms, the analyst must perform an analysis of the form, identifying its purpose, distribution, and physical attributes.

5. The systems implementation phase consists of the training and educating of personnel, and the testing of the system. People are the key ingredient in any system. Providing adequate education and training, both initially and on a continuing basis, are absolutely essential if a system is to achieve its objective. Testing the system is the final activity before implementation. The implementation of a new system can involve a conversion process from an existing system. The conversion process can include an equipment conversion, a data processing method conversion, and procedural conversion (Burch, Strater, & Grudnitski, 1979).
MatchMaker Plus: An Information System at Work in the Classroom

Technology in the classroom, the role of teachers as information managers, and the process involved in developing a computer-based information system have increased the potential of computer-based information systems at the classroom level. Elementary school teachers work in an environment where information management can be done using a computer. In doing so, they take an active role in developing systems that readily meet their needs.

Teachers can develop and/or implement an information system similar to the one presented in this project. MatchMaker Plus was designed and developed to address the relationship between the activities of a lesson or unit and the absenteeism of students throughout the school year.
CHAPTER THREE

GOAL AND OBJECTIVES OF PROJECT

The goal of this project is to design and develop a computer-based information system that can be used by elementary school teachers at the classroom level. This system will:

I. Identify various classroom data that can be used for classroom level.

II. Provide a classroom information system model that demonstrates quick access to information related to improving the correlation between student absenteeism and lesson or unit activities.

III. Provide a classroom information system model that teacher can access information on the following:

- Track planned lessons or unit activities.
- Track student's absences.
- Track student's attendance.
- Track student's missed lessons or unit activities.

IV. Describe some of the steps necessary for information system development.

V. Describe various classroom level that can be used by computer-based information system that can be used by elementary school teachers at the classroom level. Thus, the goal of this project is to design and develop a computer-based information system that can be used by elementary school teachers at the classroom level.
CHAPTER FOUR

DESIGN AND DEVELOPMENT

This chapter describes the processes that were undertaken for the development of a computer-based classroom information system called MatchMaker Plus. MatchMaker Plus is intended for the exclusive use of elementary school teachers at the classroom level. The processes described in this chapter includes the system analysis, the design, the MatchMaker Plus model, and the evaluation of MatchMaker Plus.

System Analysis Phase

The first phase in the development of MatchMaker Plus is a system analysis. System analysis is a methodology used by the developer in organizing and coordinating the activities performed in developing an information system. The steps used in the system analysis phase of MatchMaker Plus consisted of a needs analysis, scope of the system, sources of study facts, and feasibility. These initial steps were necessary to insure the development of a comprehensive information system.

Step 1: Need Analysis

As noted earlier (see Figure 1), a majority of elementary school teachers plan and record daily lessons or subject units using planners that are usually paper
documents, e.g., loose-leaf binders, notebooks, or folders. In most cases, the daily unit plan contains the lesson content and activities that will be taught. Throughout the school year, teachers frequently need to know what lesson activities were missed by students who were not present when certain lessons were taught.

In a manual classroom information system, the process to obtain accurate information concerning what was taught when a student was absent can be time consuming. The process usually requires numerous steps, some of which are:

1. The teacher has to look up the days students were absent on the school's monthly attendance registers.

2. The teacher has to cross-check attendance information with the data in the planner to determine which lesson activities were missed by the absent students.

3. The teacher has to record the findings for remedial instructions or other purposes.

Consequently, teachers are in need of a more direct approach to linking daily classroom activity information with the attendance information. An analysis of this process resulted in the identification of the following requirements or needs:

1. Improve correlation between lesson activities and student absenteeism.

2. Improve timeliness and accuracy of required data.
3. Teachers need easy access to required data.
4. Teachers need documentation of students absences and/or missed lesson activities for various student assessments.
5. Improve storage and retrieval of required data.

Step 2: Scope of the System

MatchMaker Plus was designed to incorporate information on attendance and planned activities at the classroom level. The user of MatchMaker Plus is basically the elementary school teacher. The teacher utilizes microcomputers to input, store, manipulate, and retrieve curriculum subjects, planned lesson activities, dates of planned lesson activities, and student attendance data.

Step 3: Sources of Study Facts

In designing MatchMaker Plus, interviews relating to classroom management and information system needs were conducted with two 3rd grade teachers and one 1st grade teacher. The two 3rd grade teachers teach in the same school district in California and the 1st grade teacher teaches in Wisconsin. Frameworks considered during this aspect of the analysis were:

1. Decision level.
Following the school's curriculum, the elementary school teachers determine which days are used in teaching the lessons.

As a requirement of the school, attendance is taken daily by the classroom teacher.

2. Information flow:

- Teachers record lesson plans or unit topics with presentation dates.
- Teachers take student's daily attendance and report information to the school office.

3. Input/output:

- Lesson plan activities are entered into MatchMaker Plus database files.
- Daily absence information is entered into MatchMaker Plus database files.
- Teachers can output data on student absences and missed lessons activity using MatchMaker Plus.

Step 4: Feasibility

The dimensions and constraints that influenced the design of MatchMaker Plus addressed the feasibility of this project. The technical feasibility presents the technology that must be available for MatchMaker Plus. The economic feasibility looks at the cost effectiveness of MatchMaker Plus. The legal feasibility points out what information
MatchMaker Plus can be produced and when. The operational feasibility sets the environment in which MatchMaker Plus will operate. Finally, the schedule feasibility looks at the time needed to develop MatchMaker Plus.

**Technical Feasibility**

1. Software — FileMaker\(^{(R)}\) Pro.

2. Hardware

- Macintosh
  - Minimum system: Macintosh Plus.
  - System 6.0.2 or higher, AU/X 2.0.
  - Minimum 2M with System 7.0; 4M recommended.
  - One 800K disk drive and hard disk.
  - Macintosh-compatible printer: ImageWriter, StyleWriter Series, LaserWriter Series, Apple Personal LaserWriter or Personal LaserWriter NT, or General Computer Personal Laser Printer. Also supported is any other Chooser-compatible printer, such as Hewlett-Packard's DeskWriter, LaserJet, or PaintJet, Qume's CrystalPrint, and many others.

- IBM PC-compatible computer
  - Windows
  - 386X or greater recommended.
  - Windows 3.0 or higher.
- 2M minimum, 4M recommended.
- One 800K disk drive and hard disk.
- VGA Video, Windows compatible mouse.

3. Network

- FileMaker\textsuperscript{(R)} Pro Network file in the Claris search path in the Claris folder (this file, installed with FileMaker\textsuperscript{(R)} Pro, supports AppleTalk).
- AppleTalk-compatible network.
- Novell NetWare (for networking Macintosh and IBM PC-compatible computers).

**Economical Feasibility**

As of this writing, the cost involved in the development of MatchMaker Plus is:

- Hardware - Microcomputer, disk, and printer: $2,600.00
- Software - FileMaker\textsuperscript{(R)} Pro and MatchMaker Plus: 250.00

\[ \text{\textdollar}2,850.00 \]

**Legal Feasibility**

Recording daily attendance in the public schools is mandatory. Lesson activities are left to the discretion of the teacher; however, teachers must follow the curriculum of the school district. None of the attendance and planned
activity data used in MatchMaker Plus are restricted or
confidential.

Operational Feasibility

To use MatchMaker Plus, in-service training of
elementary school teachers is required. After training, the
teachers will be able to use MatchMaker Plus, in the
classroom, to record lesson activities and daily student
attendance, retrieve missed activity information, and
generate summary reports.

Schedule Feasibility

The development of MatchMaker Plus included the
following events:

1. System Analysis 3 weeks
2. Data gathering 2 weeks
3. Design 4 weeks
4. Development 5 weeks
5. Beta testing 3 weeks
6. Revisions 2 weeks
7. Documentation 2 weeks

Design Phase

The second phase in the development of MatchMaker Plus
is the design. In the design phase, separate elements are
brought together to illustrate how something purposeful can

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be accomplished. Burch, Strater, & Grudnitski (1979) specified that the design process should use (1) organizational resources, (2) user information requirements, (3) humanizing requirements, (4) system requirements, (5) data processing methods, (6) data operations, (7) design tools, and (8) reason and creativity. For MatchMaker Plus, the design phase is divided into two parts, general systems design and procedural design.

**General Systems Design**

The general systems design concentrates on the reason for initiating systems work and systems performance requirements. The basic reason for MatchMaker Plus is to give teachers the means to control and operate an extensive information system at the classroom level. MatchMaker Plus is intended to:

1. Improve correlation between lesson activities and student absenteeism.
2. Improve timeliness and accuracy of required data.
3. Provide teachers easy access to required data.
4. Provide teachers with reports of student absences and missed activities.
5. Improve storage and retrieval of required data.

Figure 2 depicts the general systems flowchart of MatchMaker Plus. The flowchart illustrates the functionality of MatchMaker Plus. The flowchart shows the input, database
files, the match making process, outputs, and controls of the system. Input data is entered into the system from the teacher's planner and school's student enrollment roster, then stored on computer database files. MatchMaker Plus was designed to match the stored data so that it links missed activities with absences. The matched data is printed in various report formats to meet teacher's informational needs.

Figure 2. General flowchart of MatchMaker Plus
The reports designed to show: absenteeism by an individual absentee, missed activities by an individual, daily absenteeism by the class, monthly absenteeism by the class, and missed activities by the class.

MatchMaker Plus' approach to handling data enables teachers to control the information in the system. The databases of MatchMaker Plus are organized for direct access and can be stored on the hard drive of a personal computer or on double-sided, high-density diskettes. Any changes to the database are entered and immediately updated. The processing of MatchMaker Plus is carried out within the file manager application program, FileMaker™ Pro. FileMaker™ Pro gives MatchMaker Plus the power to select, update, monitor, and print information using a personal computer system.

Procedural Design

Once the data entering the system and information flowing out of the system have been established, the logic linking the input to the output is prepared. The procedural design denotes the processing steps and data flow of the system. In MatchMaker Plus, this process includes the creation and update of files, the matching and linking of data, and the creation of reports.
Step 1: Create/Update Lesson Activities Files

The first procedure required to use MatchMaker Plus is the creation or update of the Lesson Activities Files. Figure 3 illustrates the flow of creating and updating the Lesson Activities Files. The input data originates from the teacher's planner, e.g., Teacher Editions, instructional kits, magazines, or books. The plans are usually stored as paper documents and written for a variety of lessons, such as one lesson, or a set of unit lessons, or a week of lessons, or a month of lessons.

From the data kept on these paper documents, the teacher will, via a computer terminal, input the subject matters,

![Figure 3. Creating and updating the Lesson Activities Files flowchart.](image-url)
lesson activities, and planned dates into the Lesson Activities Files. Subject matter is the content area being addressed (i.e., Math, Spelling, Reading, Science, etc.). Lesson activities are brief statements describing the tasks that students will be undertaking during the lesson. Planned dates are the day(s) when the lesson units are to be taught. Each lesson activity has a planned date. Updates to the files can be viewed by the teacher through the computer screen or on a printed report.

**Step 2: Update Class List File**

The teacher also creates and updates a Class List File using MatchMaker Plus (see Figure 4). The Class List File

![Diagram](image-url)

**Figure 4.** Creating and updating the Class List File flowchart
data is obtained from the classroom enrollment roster that is usually distributed from the school office. From the roster, teachers will, via a computer terminal, input the class list into the Class List File. Like the Activities Files, the Class List File data can be viewed by the teacher through the computer screen or on a printed report.

**Step 3: Match and Create Absentee File Records**

MatchMaker Plus enables the teacher to automatically match data on the Lesson Activities Files with data on the Class List File and update the Absentee File. Figure 5 is a procedural design flowchart of the data match update that

![Data Match Absentee Input Process Flowchart](image)

**Figure 5.** Updating the Absentee File Flowchart
updates the records that are stored in the Absentee File. An Absentee File record is used as input for the Report Generator process and consists of the following fields:

- Name of the student who was absent.
- The date the student was absent.
- The subject matter.
- The lesson activities completed on the day the student was absent.

Step 4: Generate Reports

Figure 6 is a procedural design flowchart for generating reports using MatchMaker Plus. These reports can be viewed on screen or as printed output. The reports generated are:

1. Individual Absentee Report -- This report shows all the different dates a particular student was absent. The report will also show the total number of days a student was absent. If a student has a pattern of being absent on certain days of the week, it will be reflected on this report (See Appendix A).

2. Individual Missed Activities Report -- This report is the main output of MatchMaker Plus. This report not only shows the dates a particular student was absent; it also shows which subject matter and lesson objectives were missed (See Appendix B).
3. Class Absentee Report -- This report shows, by date, all students who were absent on that particular date. The report also shows a running tally of total absents throughout the school year (See Appendix C).

4. Class Monthly Absentee Report -- This report shows, by month, which students were absent during a particular month. The report also shows a running tally of total absents throughout the school year (See Appendix D).
5. Class Missed Activities Report -- Like the Individual Missed Activities report, this report also plays a significant role in the system. It shows all students who were absent and the activities they missed throughout the school year (See Appendix E).

MatchMaker Plus Model

The classroom information system model for this project was named MatchMaker Plus because it was designed to match data from the teacher's planner with data from daily attendance to provide a variety of information. To operate MatchMaker Plus, file manager application program FileMaker Pro v 2.0 or higher by Claris must be installed on a personal computer. This model uses FileMaker Pro v 2.0. FileMaker Pro's features such as file management, screen layouts, buttons, scripts, and generated reports helped make MatchMaker Plus a viable data management tool.

The model illustrates how a teacher can easily and efficiently manipulate data using computer database files. In MatchMaker Plus, layouts are used to add, change, delete, and retrieve data in FileMaker Pro database files. Buttons are utilized for navigating from one layout to another. Based on the procedural designs, this model presents the following:

1. A main menu layout. This layout is the starting point to accessing MatchMaker Plus processes.
2. FileMaker Pro database files for data storage.
3. Data entry layouts that updates the database files.
4. On-line review layouts that allows the teacher to query the database files, display information, and preview reports.
5. Generated reports that are printed for distribution.

Figure 7 is the main menu layout for MatchMaker Plus and illustrates the use of FileMaker Pro's button feature. The teacher can easily move to various processes within the system simply by using the PC mouse to "point and click" the appropriate button. The buttons on MatchMaker Plus main menu will allow the teacher to go to the layouts for entering data, reviewing and generating reports, and quitting the systems. The three buttons labeled Planning Activities, Class List, and Absent Student are used to go to the data entry layouts. The five buttons labeled Days Absent, Missed Activities, Class Absence Summary, Class Monthly Absence Summary, and Class Missed Activities Summary are used to go to the layouts that generate the reports. The Quit button will do just that, quit the system.
Figure 7. Main Menu Layout

Updating Planned Activity Files

To update the lesson activity files, the teacher will click on the Planning Activities button on the main menu layout. This action will bring up the Planning Activities layout as illustrated in Figure 8. On this layout, seven buttons are utilized. One button is used to return the
teacher to the main menu and six buttons are used to go to six activity database files. Each activity file is for one subject matter such as reading, spelling, and math. All six files do not have to be used. The teacher decides what subjects are stored in the files. The labels on the buttons can be modified by the teacher to identify the content of the
Figure 9. Planning activities update layout

planned activity files. Clicking on the button number will bring up the activity file update layout (see Figure 9) and allow the teacher to update an activity file. Figure 9 illustrates the update layout that was activated by clicking on the Math button. On the update layout, the teacher only has to make three entries to update a planned activity record, the subject matter, date of the activity, and the
activity. The activity is made up of short phases that explain the subject's planned activities for a particular day. The date's day name is automatically displayed through a feature of FileMaker Pro. Other features of FileMaker Pro that can be used on this layout are the sort, find, spell checker, delete records, duplicate records, and printing. Activating the Go Back button in the upper left hand corner will return the teacher to the Planning Activities layout. Figure 10 is a sample of an on-line report of the activity file records.

Figure 10. On-line planning activities report
Back at the Planning Activities layout (See Figure 8), the teacher can select another activity file to update or return to the main menu layout. The teacher can update the Planned Activity files as often as necessary. Whatever activities are stored in the files on the day a student is absent will be used in the updating of the absentee file process.

Updating Class List File

To update the class list file, the teacher will click on the Class List button on the main menu layout. This action will bring up the Class List Entry layout as illustrated in Figure 11. On this layout, the teacher can update the class list by entering or deleting student names. In this model, the formatting of the student name is left to the discretion of the teacher. Last name can be typed first for sorting purposes. Like the activity update layout, this layout also allows the teacher to use FileMaker Pro features such as sorting and printing the file.

For this class list file, the report looks the same as the layout. Activating the return button in the upper left hand corner will return the teacher to the main menu layout.
Figure 11. Class list entry layout

Updating Absentee File

Updating the absentee file is done automatically by FileMaker Pro features. The only entry the teacher has to make is marking the students who are absent. This process is started when the teacher clicks on the Absent Student button on the main menu layout.

Figure 12 shows the Absent Student Entry layout. When the layout is activated the current date is automatically
Figure 12. Absent student entry layout displayed in the heading and is used as an entry in the absentee record. To record students who are absent for the date in the heading, the teacher will simply put an “X” in the small box next to the absent students and click the Record Entries button. MatchMaker Plus will do the rest. An absentee file record automatically will be created and stored with the student name, the date of the absence, and the planned activities for that day. The teacher is automatically returned to the main menu layout after the
process is completed. However, if the teacher decides not to process any students, the Cancel Session button in the upper left hand corner of the layout can be used to return the teacher to the main menu layout. If a mistake was realized after the update process, then corrections should be made on the Day Absent and the Missed Activity layouts that will be explained later in this chapter.

**On-line Review and Reports**

After the Absentee File is updated, a variety of information can be retrieved from the system. Information pertaining to absenteeism on an individual student or the whole class can be obtained by just a few keystrokes or clicks of the mouse.

Figure 13 is a sample of the Days Absent layout for a student. A teacher can bring up this layout by clicking the Day Absent button on the main menu and selecting the student from the class list. The student records are automatically searched and retrieved from the Absentee File, sorted by absent date, total absences summarized, and the information is displayed on the layout. The layout shows the student name, the date, the date's day name, and the total days the student was absent for the school year. If a student had a pattern of being absent on certain days then it will be
Figure 13. Days Absent layout sample

realized on this layout. This layout can also be used to correct a student's record on the Absentee File. Records can be deleted, by clicking on the Delete Record button when a student is marked absent in error. The teacher can also change the date and update the missed activities for that date.

The Print Report button allows the teacher to print the displayed information (See Appendix A). The Select Another Student and Return buttons give the teacher the option of
selecting another student from the class list for display or returning directly to the main menu layout.

Figure 14 is a sample of the Individual Missed Activities layout. A teacher can bring up this layout by clicking the Missed Activities button on the main menu and the selecting of the student from the class list. The student records are automatically searched and retrieved from the Absentee File, sorted by absent date, and the information is displayed on the layout. The layout shows the date, the date's day name, the student name, and most importantly the missed activities. Like the Absent Day layout, the teacher can change the date and update the missed activities for that date on this layout. The Print Report button allows the teacher to print the displayed information (See Appendix B). The Select Another Student and Return buttons give the teacher the option of selecting another student from the class list for display or returning directly to the main menu layout.

From the main menu layout, the teacher can obtain the three class summary reports simply by clicking on the appropriate Match Maker buttons. The reports are generated automatically. MatchMaker Plus allows the teacher to review the reports before printing. The teacher can then choose to print all or part of the report. Samples of the summary reports are in Appendix C through E.
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/11/93</td>
<td>Math</td>
<td>Match number (word) with number (numeric).</td>
</tr>
<tr>
<td></td>
<td>Reading</td>
<td>Read &amp; verbally talk thru Peter Rabbit - pause for questions.</td>
</tr>
<tr>
<td></td>
<td>Spelling</td>
<td>Introduce students to words. Student completing sentences. (Short &quot;a&quot; words with final &quot;p&quot; (ex. tap, sap))</td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>Discuss and begin daily record of weather.</td>
</tr>
<tr>
<td>10/10/93</td>
<td>Math</td>
<td>Math worksheet with blocks - part 2. (Adding number 1-5)</td>
</tr>
</tbody>
</table>

**Figure 14.** Missed Activities layout sample

**Evaluation**

As a computer-based classroom level information system, does MatchMaker Plus meet the needs of elementary teachers? Does MatchMaker Plus give teachers the means to control and operate an extensive information system at the classroom level? To answer these questions, the MatchMaker Plus model was reviewed by two elementary school teachers. The teachers tested the MatchMaker Plus on a Macintosh Performa 550 with a
HP 550c printer. As a result of their review of MatchMaker Plus, some design revisions were suggested.

Teachers' Feedback

The teachers who evaluated MatchMaker Plus identified its potential classroom uses as follows:

MatchMaker Plus' Classroom Uses

1. To monitor student's missed assignments for S.S.T (Student Study Team) for placement purposes.
2. To do record-keeping.
3. To do multi-purpose reporting.
   - Parent conferences. Documents that track student's progress and tracks lack of progress.
   - Sharing information with student study teams.
   - IEP -- Individual Education Programs. If a student is frequently absent they might not qualify for special services. The reports could also help assess a student's knowledge on a lesson or unit or if the student missed it.
   - Foster home to foster home, school to school use for transient child.
   - The teacher would be able to identify the need for review on specific topics.
4. To compile a list of assignments that covered a particular concept.

5. For teachers to identify the students that were out on a certain day.

6. For teachers to make student study groups based on what specific students have missed (this could help in peer tutoring groups).

Recommendations by the Teachers:

1. Some fonts are too small for comfort. Need larger print for more comfortable reading.

2. Activity field too limited. Only shows three lines at a time - need to expand number of lines.

3. Report of missed activities is limited in the activity field. If information was 5 lines long, only 3 lines would print.

4. Have a calendar available in the planning activity phase. A calendar would be very helpful and a time-saver.

5. One-page report of one whole week of planned activities so the teacher can review a week of activities at a glance.

7. Color-code subject headings on Planning Activity layout. Color makes it more pleasing to the eye and easier to identify the subjects.
Modifications Resulting From Feedback

As a result of the teachers' recommendations, the following changes were made to MatchMaker Plus:

1. More color was added in the layouts.
2. A larger font was used on the layouts.
3. More lines are displayed within the "activity" field.

MatchMaker Plus' Overall Strengths and Limitations

As an information system tool at the classroom level, MatchMaker Plus offers several important advantages. First, it enables teachers to process more information with a given amount of data. With MatchMaker Plus, an assortment of information is derived from different combinations of dates, planned activities, student, and attendance data. Another important advantage of MatchMaker Plus is the elimination or reduction of data duplication. Data integrity is maintained within the system and conflicting output is kept to a minimum. For example, the data that is displayed or used on one report is also used in different ways in other displays and reports. Better data management is another advantage of MatchMaker Plus. Data is centrally organized, stored on a computer hard drive or diskette for easy portability, and easily accessed for manipulation by the teacher. Through computer program processing, appropriate information is
quickly and accurately obtained to meet the needs of the teacher. The teachers who evaluated MatchMaker Plus found MatchMaker Plus to be:

1. Supportive to student's portfolio assessment.
2. Good time-saver for teacher record-keeping.
3. Easy access to data.
4. Spell checker function very useful. Save the teacher from embarrassing moments when documents with inadvertent spelling errors are handed out to parents, administrators, and fellow teachers.
5. Monthly displayed report of missed assignments for absent students.
6. Useful tool that allows teachers to have a multitude of necessary student information in an organized way at a touch of a button.

The power of MatchMaker Plus is further enhanced by the features of FileMaker(R) Pro. Finding, sorting, editing, spell checking, point and click buttons, and printing are major time-saving features that MatchMaker Plus advantageously utilizes to give the teacher a comprehensive classroom information system.
Overall Limitations of MatchMaker Plus as a Classroom Level Information System

A major limitation of MatchMaker Plus is that it requires the installation of FileMaker(R) Pro on the computer system before it can operate. Being a classroom information system prototype is another limitation of MatchMaker Plus. As a prototype, MatchMaker Plus is self-contained and is not designed to be integrated with other computer-based information systems. The planned activities used in MatchMaker Plus are limited to six subjects.

Recommendations for Future Design and Development

As an information system, MatchMaker Plus is designed to grow. More subjects can be added. MatchMaker Plus would be greatly enhanced with a built-in calendar that will be available as teachers plan their activities. Another plus for MatchMaker Plus would be to add a full-blown planner that is directly linked into MatchMaker Plus.
APPENDIX A INDIVIDUAL ABSENTEE REPORT
<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/11/93</td>
<td>Monday</td>
</tr>
<tr>
<td>10/18/93</td>
<td>Monday</td>
</tr>
<tr>
<td>11/01/93</td>
<td>Monday</td>
</tr>
</tbody>
</table>

Total Days Absent: 3
### Missed Activities by a student

#### 10/11/93 Monday Leo Lyon

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Match number (word) with number (numeric).</td>
</tr>
<tr>
<td>Reading</td>
<td>Read &amp; verbally talk thru Peter Rabbit - pause for questions. (Making Predictions)</td>
</tr>
<tr>
<td>Spelling</td>
<td>Introduce students to words. Student completing sentences. (Short &quot;a&quot; words with final &quot;p&quot; (ex. tap, sap))</td>
</tr>
<tr>
<td>Science</td>
<td>Discuss and begin daily record of weather. (Weather)</td>
</tr>
</tbody>
</table>

#### 10/18/93 Monday Leo Lyon

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Math worksheet with blocks - part 2. (Adding number 1-5)</td>
</tr>
<tr>
<td>Reading</td>
<td>Matching Worksheet - Cause and effect. (Cause and effect relationships)</td>
</tr>
<tr>
<td>Spelling</td>
<td>Introduce students to words. Student completing sentences. (Short &quot;a&quot; words with final &quot;n&quot; (ex. man, tan))</td>
</tr>
<tr>
<td>Science</td>
<td>Discuss and identify seasons with pictures. (Weather)</td>
</tr>
</tbody>
</table>
**Missed Activities by a student**

11/01/93  Monday  Leo Lyon

<table>
<thead>
<tr>
<th>Subject</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Use calculator to add vertical math sentences. (Adding number 6-10)</td>
</tr>
<tr>
<td>Reading</td>
<td>Explain and discuss inferences. Read short story out loud. Discuss clues and inference. (Making inferences)</td>
</tr>
<tr>
<td>Spelling</td>
<td>Introduce students to words. Puzzle worksheets. (Short &quot;a&quot; words with final &quot;t&quot; (ex. sat, cat, pat))</td>
</tr>
<tr>
<td>Science</td>
<td>Find object under the feeling word list. (Senses - touch)</td>
</tr>
<tr>
<td>Date</td>
<td>Monday</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>10/11/93</td>
<td>David Lemontre</td>
</tr>
<tr>
<td></td>
<td>John Good</td>
</tr>
<tr>
<td></td>
<td>Leo Lyon</td>
</tr>
<tr>
<td>Total absences: 3</td>
<td>YTD total: 3</td>
</tr>
<tr>
<td>Date</td>
<td>Thursday</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>10/28/93</td>
<td>Slim Pickens, Roy Rogers, David Lemontre, Sally Worth</td>
</tr>
<tr>
<td></td>
<td>Total absences: 4</td>
</tr>
<tr>
<td></td>
<td>YTD total: 15</td>
</tr>
<tr>
<td>Date</td>
<td>Day</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>11/08/93</td>
<td>Monday</td>
</tr>
<tr>
<td>11/10/93</td>
<td>Wednesday</td>
</tr>
<tr>
<td>11/11/93</td>
<td>Thursday</td>
</tr>
</tbody>
</table>
APPENDIX D CLASS MONTHLY ABSENTEE
SUMMARY REPORT
<table>
<thead>
<tr>
<th>Date</th>
<th>Class List</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/11/93</td>
<td>David Lemontre</td>
</tr>
<tr>
<td>10/11/93</td>
<td>John Good</td>
</tr>
<tr>
<td>10/11/93</td>
<td>Leo Lyon</td>
</tr>
<tr>
<td>10/12/93</td>
<td>Harry Lyon</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Robin Batman</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Sandy Rhoades</td>
</tr>
<tr>
<td>10/15/93</td>
<td>Fuzzy Peach</td>
</tr>
<tr>
<td>10/15/93</td>
<td>Rich Mann</td>
</tr>
<tr>
<td>10/18/93</td>
<td>Harry Lyon</td>
</tr>
<tr>
<td>10/18/93</td>
<td>Leo Lyon</td>
</tr>
<tr>
<td>10/27/93</td>
<td>Sally Worth</td>
</tr>
<tr>
<td>10/28/93</td>
<td>Slim Pickens</td>
</tr>
<tr>
<td>10/28/93</td>
<td>Roy Rogers</td>
</tr>
<tr>
<td>10/28/93</td>
<td>David Lemontre</td>
</tr>
<tr>
<td>10/28/93</td>
<td>Sally Worth</td>
</tr>
<tr>
<td>10/29/93</td>
<td>Roy Rogers</td>
</tr>
</tbody>
</table>

Total Absences: 16  YTD Total: 16
<table>
<thead>
<tr>
<th>Date</th>
<th>Class List</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/01/93</td>
<td>Harry Lyon</td>
</tr>
<tr>
<td>11/01/93</td>
<td>Leo Lyon</td>
</tr>
<tr>
<td>11/01/93</td>
<td>Sally Worth</td>
</tr>
<tr>
<td>11/03/93</td>
<td>Minny Holmes</td>
</tr>
<tr>
<td>11/04/93</td>
<td>Johnny Appleseed</td>
</tr>
<tr>
<td>11/05/93</td>
<td>Johnny Appleseed</td>
</tr>
<tr>
<td>11/08/93</td>
<td>Mae Flowers</td>
</tr>
<tr>
<td>11/10/93</td>
<td>Mae Flowers</td>
</tr>
<tr>
<td>11/11/93</td>
<td>Dusty Rhoades</td>
</tr>
<tr>
<td>11/11/93</td>
<td>Shirley Sweethart</td>
</tr>
</tbody>
</table>

**Total Absences: 10**  
**YTD Total: 26**
APPENDIX E CLASS MISSED ACTIVITIES SUMMARY REPORT
### Math
- Match number (word) with number (numeric).

### Reading
- Read & verbally talk thru Peter Rabbit - pause for questions. (Making Predictions)

### Spelling
- Introduce students to words. Student completing sentences. (Short “a” words with final “p” (ex. tap, sap))

### Science
- Discuss and begin daily record of weather. (Weather)

---

#### Monday

<table>
<thead>
<tr>
<th>Date</th>
<th>Math Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/11/93</td>
<td>Match number (word) with number (numeric).</td>
</tr>
<tr>
<td>10/12/93</td>
<td>Read &amp; verbally talk thru Peter Rabbit - pause for questions. (Making Predictions)</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Introduce students to words. Student completing sentences. (Short “a” words with final “p” (ex. tap, sap))</td>
</tr>
</tbody>
</table>

---

#### Tuesday

<table>
<thead>
<tr>
<th>Date</th>
<th>Math Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/12/93</td>
<td>Read story “Enormous Turnip”. Do spinner worksheet. (Adding number 1-5)</td>
</tr>
<tr>
<td></td>
<td>Desktop sheets. (Making Predictions)</td>
</tr>
<tr>
<td></td>
<td>Practice writing words. (Short “a” words with final “p” (ex. tap, sap))</td>
</tr>
<tr>
<td></td>
<td>Discuss and look for signs of weather. (Weather)</td>
</tr>
</tbody>
</table>

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#### Thursday

<table>
<thead>
<tr>
<th>Date</th>
<th>Math Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/14/93</td>
<td>Math manipulative blocks. Work in pairs. (Adding number 1-5)</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Vocabulary Words - Read, discuss, and practice.</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Review words. (Short “a” words with final “p” (ex. tap, sap))</td>
</tr>
<tr>
<td>10/14/93</td>
<td>Take outdoor walk and look for signs of seasons. (Weather)</td>
</tr>
</tbody>
</table>

---

- David Lemontre
- John Good
- Leo Lyon
- Harry Lyon
- Robin Batman
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 10/15/93   | **Math**
             | Math worksheet with blocks - part 1. (Adding number 1-5)                  |
|            | **Special Reading**                                                      |
|            | Read "Itsy Bitsy Spider" - student ask what and why. (Cause and effect relationships) |
|            | **Spelling**                                                             |
|            | Test. (Short "a" words with final "p" (ex. tap, sap))                    |
|            | **Science**                                                              |
|            | Make a season wheel. (Weather)                                           |

| 10/16/93   | **Math**
             | Math worksheet with blocks - part 2. (Adding number 1-5)                  |
|            | **Reading**                                                            |
|            | Matching Worksheet - Cause and effect. (Cause and effect relationships) |
|            | **Spelling**                                                           |
|            | Introduce students to words. Student completing sentences.              |
|            | (Short "a" words with final "n" (ex. man, tan))                        |
|            | **Science**                                                            |
|            | Discuss and identify seasons with pictures. (Weather)                   |

- Sandy Rhoades
- Fuzzy Peach
- Rich Mann
- Harry Lyon
- Leo Lyon
### Class Missed Activities Report

Date: 11/15/93

#### Wednesday

<table>
<thead>
<tr>
<th>Subject</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Use math number line - do addition sentences. (Adding number 6-10)</td>
</tr>
<tr>
<td>Reading</td>
<td>Match pictures. (Short &quot;i&quot;)</td>
</tr>
<tr>
<td>Spelling</td>
<td>Worksheets. (Short &quot;a&quot; words with final &quot;d&quot; (ex. had, dad))</td>
</tr>
<tr>
<td>Science</td>
<td>Discuss smells. (Senses - smell)</td>
</tr>
</tbody>
</table>

- Sally Worth

#### Thursday

<table>
<thead>
<tr>
<th>Subject</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Math worksheets with number line. (Adding number 6-10)</td>
</tr>
<tr>
<td>Reading</td>
<td>Distribute 3x5 index cards with short &quot;i&quot; words on them. Student listen and hold up card when they hear sound. Use</td>
</tr>
<tr>
<td>Spelling</td>
<td>Review and write words. (Short &quot;a&quot; words with final &quot;d&quot; (ex. had, dad))</td>
</tr>
<tr>
<td>Science</td>
<td>Use smell for identification. (Senses - smell)</td>
</tr>
</tbody>
</table>

- Slim Pickens
- Roy Rogers
- David Lemontre
- Sally Worth
<table>
<thead>
<tr>
<th>Date</th>
<th>Math</th>
<th>Reading</th>
<th>Spelling</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Friday</strong></td>
<td><strong>10/29/93</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>Draw pictures to match math sentences. (Adding number 6-10)</td>
<td>Vocabulary Words - Read, discuss, and practice</td>
<td>Test. (Short &quot;a&quot; words with final &quot;d&quot; (ex. had, dad))</td>
<td>Discuss and list feeling words. (Senses - touch)</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
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<tr>
<td>Spelling</td>
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<tr>
<td>Science</td>
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</tr>
<tr>
<td><strong>Monday</strong></td>
<td><strong>11/01/93</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>Use calculator to add vertical math sentences. (Adding number 6-10)</td>
<td>Explain and discuss inferences. Read short story out loud. Discuss clues and inference. (Making inferences)</td>
<td>Introduce students to words. Puzzle worksheets. (Short &quot;a&quot; words with final &quot;t&quot; (ex. sat, cat, pat))</td>
<td>Find object under the feeling word list. (Senses - touch)</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Spelling</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wednesday</strong></td>
<td><strong>11/03/93</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>Do 2 vertical math worksheets. (Adding number 6-10)</td>
<td>Sentences on board - read aloud with student. Underline, discuss, fill in sentences. (Short &quot;u&quot; words)</td>
<td>Answer riddles using &quot;a&quot; / &quot;t&quot;. (Short &quot;a&quot; words with final &quot;t&quot; (ex. sat, cat, pat))</td>
<td>Students describe how an object look. (Senses - sight)</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Roy Rogers
- Harry Lyon
- Leo Lyon
- Sally Worth
- Minny Holmes
<table>
<thead>
<tr>
<th>Date</th>
<th>Class Missed Activities Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>11/04/93</td>
<td><strong>Math</strong> Use cubes to add 3 numbers. (Adding number 6-10)</td>
</tr>
<tr>
<td></td>
<td><strong>Reading</strong> Vocabulary Words - Read, discuss, and practice</td>
</tr>
<tr>
<td></td>
<td><strong>Spelling</strong> Review and write words. (Short &quot;a&quot; words with final &quot;t&quot; (ex. sat, cat, pat))</td>
</tr>
<tr>
<td></td>
<td><strong>Science</strong> Take sight walk. (Senses - sight)</td>
</tr>
<tr>
<td></td>
<td>● Johnny Appleseed</td>
</tr>
<tr>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>11/05/93</td>
<td><strong>Math</strong> Use chips to match pattern - worksheet - part 1. (Adding number 6-10)</td>
</tr>
<tr>
<td></td>
<td><strong>Reading</strong> Match pictures. (Short &quot;u&quot; words)</td>
</tr>
<tr>
<td></td>
<td><strong>Spelling</strong> Test. (Short &quot;a&quot; words with final &quot;t&quot; (ex. sat, cat, pat))</td>
</tr>
<tr>
<td></td>
<td><strong>Science</strong> Student illustrate what was observed on sight walk. (Senses - sight)</td>
</tr>
<tr>
<td></td>
<td>● Johnny Appleseed</td>
</tr>
<tr>
<td>Monday</td>
<td></td>
</tr>
<tr>
<td>11/08/93</td>
<td><strong>Math</strong> Use chips to match pattern - worksheet - part 2. (Adding number 6-10)</td>
</tr>
<tr>
<td></td>
<td><strong>Reading</strong> Student draw pictures. (Short &quot;u&quot; words)</td>
</tr>
<tr>
<td></td>
<td><strong>Spelling</strong> Introduce students to words. Student completing sentences. (Short &quot;o&quot; words with final &quot;n&quot; (ex. ten, pen, hen))</td>
</tr>
<tr>
<td></td>
<td><strong>Science</strong> Eat onion and apple while holding nose. (Senses - taste)</td>
</tr>
<tr>
<td></td>
<td>● Mae Flowers</td>
</tr>
<tr>
<td>Date</td>
<td>Activity Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11/10/93</td>
<td><strong>Wednesday</strong></td>
</tr>
<tr>
<td></td>
<td>Math: Review and test. (Adding number 6-10)</td>
</tr>
<tr>
<td></td>
<td>Reading: Vocabulary Words - Read, discuss, and practice</td>
</tr>
<tr>
<td></td>
<td>Spelling: Write story. (Short &quot;e&quot; words with final &quot;n&quot; (ex. ten, pen, hen))</td>
</tr>
<tr>
<td></td>
<td>Science: Draw sweet vs. salty foods. (Senses - taste)</td>
</tr>
<tr>
<td></td>
<td><strong>Mae Flowers</strong></td>
</tr>
<tr>
<td>11/11/93</td>
<td><strong>Thursday</strong></td>
</tr>
<tr>
<td></td>
<td>Math: Use cubes for board work. (Subtracting number 1-5)</td>
</tr>
<tr>
<td></td>
<td>Reading: Match pictures. (Long &quot;a&quot; words)</td>
</tr>
<tr>
<td></td>
<td>Spelling: Review. (Short &quot;e&quot; words with final &quot;n&quot; (ex. ten, pen, hen))</td>
</tr>
<tr>
<td></td>
<td>Science: Discuss and brainstorm not using senses. (Senses - taste)</td>
</tr>
<tr>
<td></td>
<td><strong>Dusty Rhoades</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Shirley Sweethart</strong></td>
</tr>
</tbody>
</table>

79
REFERENCE


