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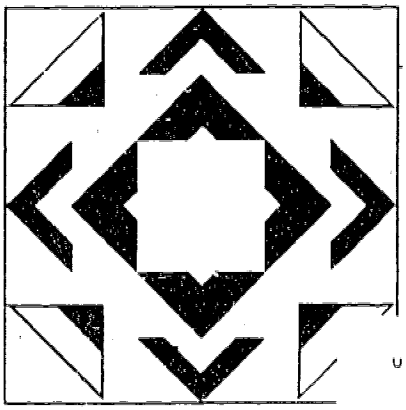
ABSTRACT

This paper is one in a publication series containing general knowledge which can help colleges and universities in the various phases of developing comprehensive cooperative education programs (see note). It focuses on design of a suitable cooperative management information system. The paper begins by establishing a perspective about management information systems (MISs) and pointing out the need for information management in cooperative education by review of cooperative information needs. Common weaknesses in cooperative education information management are then detailed, and suggestions are made for overcoming them through an MIS. The final section presents a process for MIS development that involves four steps: (1) specifying objectives; (2) identifying information and data needs; (3) determining data collection, storage, manipulation, and reporting methods; and (4) deciding how the MIS will assist in daily program objectives and overall planning. (YLB)

Developing a Comprehensive Cooperative Education Program:
MANAGEMENT INFORMATION SYSTEMS



by

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Preface

In moving from modest to large scale cooperative education programs, colleges and universities must anticipate the new needs that will be brought about by increased size. Many procedures that are appropriate for a small program cannot be carried over into a larger one. The management of information is one such case, in which systems designed for 50 students may not suffice for 500. Not only may present management information methods be unable to accommodate greater numbers, but the systems may collect data incompletely, inconsistently, or fail to produce relevant information.

The design of a suitable cooperative management information system is the focus of the following publication. It seeks to help all cooperative education institutions to understand the significance of effective information management. It also serves as a guideline for the development of an appropriate system, helping institutions to identify objectives, determine needs, devise methods of handling information, and apply the gathered information.

Cooperative education programs both large and small will benefit from keeping pace with the advances in information management. But for those institutions moving toward comprehensive cooperative programs, the development of more effective information systems takes on added significance. It can play a major role in determining the ease with which a program is implemented, the achievement of expected outcomes, and the successful ongoing operation of the program.

Management Information Systems and Cooperative Education

Cooperative education is an educational strategy which has unique information collection, storage, manipulation, and utilization needs. For example, co-op directors and their staffs are responsible for collecting information on students and employers; matching students with work experiences; monitoring the progress of students during their work experiences; evaluating the results of each student-employer match; and making detailed progress reports to top level administrators and, in many cases, state and federal governments. All these tasks require information collection, storage, manipulation, and utilization.

One method of dealing with these needs is to develop Management Information Systems (MIS) for cooperative education. This chapter establishes a perspective about Management Information Systems; points out the need for information management in cooperative education; details common weaknesses in cooperative education information collection, reporting, and utilization; and suggests a four-step process that individual institutions might use to (1) specify program objectives; (2) determine corresponding information needs; (3) devise data collection, storage, manipulation and reporting procedures; and (4) utilize the derived information in program management. The end result of this process is a Cooperative (Education) Management Information System (CMIS) unique to individual institutions.

A Management Information System Perspective

The MIS concept is relatively recent, originating in the field of business management after World War II. As Robert Murdick and Joel Ross point out, the 20th century has seen a significant change in the way management is viewed by those in the field and those who teach business administration. Before World War II, management was generally considered an art to be learned by the case study method. Students of management and practicing managers were "expected to gain an intuitive insight into the principles underlying the problems they . . . [would be] expected to face." In the last thirty years management has increasingly come to be viewed as a science based on "a more structured approach to decision making."[1]

The change is related to the shift in business, science, and other fields from analysis to synthesis, from looking closely at individual parts of an organization to an "emphasis on combining the results of analysis into a whole . . . ."[2] This broader focus, often referred to as the "total systems" approach, is an important feature of an MIS because all elements of the system are "functionally and operationally united."[3]

All management information systems, then, are basically organized approaches to collecting, processing, and utilizing information in order to (1) determine if the objectives of an organization have been achieved, and (2) assist in decision making. As one management text states, their purpose is to "provide the **necessary** information at the proper **time** and **place** so as to enable the effective **management** of all facets of an organization."[4]

The Need for Information Management in Cooperative Education

How can an MIS support a cooperative education effort? The advantages can best be seen by reviewing cooperative information needs, examining common weaknesses in how

information is currently provided, and explaining how an MIS might overcome the stated weaknesses.

Cooperative Education Information Needs

The cooperative experience develops from and depends upon clear, accurate, and frequent communication among the parties to the experience: employers, educators, and students. To be in a position to respond to employer requests, directors of cooperative education constantly take the pulse of the business community. At the same time, because co-op is a relatively new option in many colleges and universities and because it frequently depends upon state and federal funding, it often receives more than its share of scrutiny. Coordinators respond to information requests from central administration and governmental agencies and are required to develop thorough rationales at budget building time. Finally, because cooperative education is optional at most institutions, it is essential that co-op education be marketed and communicated effectively to students.

The complex task of placing qualified students with various employers in positions appropriate to individual abilities and aspirations demands comprehensive information about students as well as a clear description of individual employer positions. The management of information required for the matching process is far easier for the coordinator with a few students and a limited number of placements. It becomes much more difficult as the coordinator load increases in a maturing program. Once students are placed, the determination of individual learning objectives and the consequent evaluation of whether learning has occurred add a further dimension to information collection, maintenance, and manipulation.

Information is also needed for program evaluation. Tyler notes that cooperative education requires both internal and external evaluation at various points in overall program activity.[5] Initial program directions (objectives and activity plans) need to be assessed. Actual program activity needs to be reviewed to monitor whether and to what extent the planned program is being implemented. Planned outcomes must be established, and both planned and unplanned outcomes need to be evaluated. The complex nature of this particular learning strategy multiplies and further complicates the amount of information necessary to provide effective evaluation.

In summary, several factors point out the value of applying the MIS concept to cooperative education: (1) the need to communicate with employers, students, college administrators, and governmental agencies; (2) the complicated nature of the co-op placement activity; (3) the determination and evaluation of unique student learning objectives; and (4) the overall evaluation of program activity.

How an MIS Can Overcome Weaknesses In Co-op Information Collection and Reporting

Nearly all cooperative education programs do collect some information about co-op students and evaluate semester student performance. Many even undertake occasional evaluation of the long-range effect of the cooperative education interaction on student development as well as the general effectiveness of the institution's approach to the cooperative effort. Few coordinators or directors of cooperative education, however, have ever spent time reviewing their information needs and developing a systematic approach to such information collection, manipulation, and utilization. As a result, certain weaknesses in information collection, reporting, and utilization are common.

Before discussing these weaknesses it is necessary to differentiate between "information" and "data" as they are used in the field of information management and the rest of this chapter. "Data" refers to discrete facts, such as an individual student's name, address, or curriculum. "Information" refers to **processed** data, i.e., data that have been added, averaged, classified, or manipulated in some way to make them more meaningful. Examples of information derived from the above data would be the total number of co-op students living in a particular city and the total number of co-op students in each curriculum. Note that some of the following weaknesses involve data, while others involve information.

1. **Irrelevant data are collected.**
   Rather than collect too little data, some directors attempt to collect too much. Application forms require coordinators to fill out data that is not utilized or collect the same piece of data on various forms when it could better be collected less frequently. In contrast, MIS would only collect data essential to meeting a program objective, and it would collect data as few times as necessary.

2. **Data are collected in an unorganized manner.**
   Often data collection occurs in such a format that its ability to generate information in combination with other data is severely limited. For example, coordinators might collect wage and salary data from students on a form separately from an employer data form and consequently find it extremely difficult to correlate the two pieces of data to come up with an information report that reflects salaries paid to students by specific employers. In the case of larger, decentralized programs with several coordinators, different units or individuals may be collecting different types of data in still different formats. This even more severely limits the ability to draw useful conclusions about co-op from an institutional framework. With an MIS all coordinators would collect similar kinds of data in similar formats.

3. **Data are collected and manipulated in an untimely manner.**
   Frequently programs with adequate collection instruments fail to develop clearly defined procedures that answer such questions as who is to provide what data, when it is to be provided, and how and when it will be manipulated. When timelines and responsibilities have not been established, data are either not completely provided or are not provided by all coordinators at the same time. Under these conditions, manipulation of data to provide information is either delayed or does not even occur. In both instances information that could be very useful in program activity or planning is unavailable at the appropriate time. An MIS would establish individual responsibilities and written timelines for all aspects of data collection and manipulation.

Available information is not reported clearly to appropriate decision makers.
State and federal laws require co-op directors prepare certain kinds of reports. However, very often it seems that not enough time remains to prepare accurate, timely, and clear reports on program accomplishments to use within an institution, to communicate with employers, or to attract additional students. Because of difficulties with timely and appropriate data collection and manipulation, federal requirements, and other program responsibilities, directors may fail to take the time to present and interpret information about their program on a regular basis to those who would be in the best position to use it. An MIS establishes who needs to be routinely informed of co-op activity and when and in what format such reports will be generated.

5. **Available information is not used in decision making.**
   Co-op directors often make decisions based on hunches influenced by a few isolated facts rather than make decisions based on a broad, total program perspective. Instead of using information systematically, they tend to set a program direction and then hunt for information to justify that direction. In contrast, an MIS would establish clear guidelines for the presentation and utilization of information in program planning.

6. **Information collection is too person-dependent.**
   Small co-op programs are often managed by a single coordinator. That same person often keeps records of employers, students, and active placements in his or her head or on a few pieces of paper in a system known only to that individual. Like the co-op program itself, such an information process poses few problems as long as this person is in charge and the program remains small. Should the program grow or the person leave, chaos can result. Because an MIS has established instruments and procedures, it tends to be less person dependent and provides more easily for transition or growth.

Despite these information problems in programs of cooperative education, communication continues to be essential, reports continue to be necessary, and the process of matching students with placements continues to occur. Unfortunately, each activity requires the coordinator to go back to one or more files and cull data in a very inefficient manner. The end result is that the quality of reports is often dubious, the collection of information is time consuming, and ultimately programming decisions and student placements tend to depend heavily on individual perception (hunches) rather than upon a combination of the presentation of fact and its interpretation by staff.

Building a Cooperative (Education) Management Information System (CMIS)

The first sections of this chapter defined MIS, demonstrated the need for MIS in cooperative education, and focused more precisely on how MIS might overcome common weaknesses manifest in current cooperative information collection and reporting. What follows is a review of the steps involved in the **process** of **building** and **maintaining** a Management Information System for a cooperative education program. It is important to note the boldface words in the prior sentence. What follows is a **process** and not a description of a product or a computer program that may have universal application at various institutions. The end **product** or CMIS resulting from such a process will be unique because institutional [illegible] and information [illegible]que. This is a process for **building** and maintaining an MIS in the sense that an MIS should not be viewed as a static but as a dynamic system in tune with the dynamism of cooperative education and the technological advances of information management science. The next section overviews the four main steps in this process.

Step One: Determine Program Objectives

Many program directors, in their pragmatic efforts to build and maintain cooperative education programs, have not taken the time to establish a clear, written philosophy and to define objectives. Even if such a philosophy is written and if initial objectives have been established, both are infrequently reviewed or revised in relation to current experience.

Both situations are unfortunate because they ignore the importance of carefully specifying objectives.

Why begin developing a CMIS by stating objectives? The reason becomes clear when one understands the relationship between objectives and information. Objectives state what the director and staff hope to accomplish or what they hope the students will accomplish as a result of their cooperative experiences. Information, in turn, helps to implement the objectives and, more importantly, tells whether the objectives have been accomplished. For example, if an objective is "to increase the number of employers to 300," the staff may need mailing labels (a type of information) for all employers in the area where most potential co-op students live. To see if the objective has been accomplished, information on the total number of active employers will have to be obtained. Conversely, if no such objective exists, it makes no sense to spend time and effort obtaining this information.

Another reason why CMIS development should begin with objectives concerns the survival and growth of the co-op program within an institution. Sheila C. Gordon and Harry N. Heinemann stress the importance of detailing how the cooperative education effort makes its own objectives or assists in the accomplishment of broader, institutional objectives. They emphasize that reporting on co-op's participation in the objective setting process can be critical to administrative program support.[5]

It isn't easy to identify a comprehensive set of objectives for a program of cooperative education. Moreover, it's hard to maintain overall program perspective in the process of such an effort. Some help may come from Title VIII proposals and instructional or unit plans, which often speak to cooperative education objectives for a particular year. In addition, cooperative education rationales presented to curriculum committees and catalog statements about cooperative education speak to more general objectives or program philosophy. Unfortunately, annual objectives are often quite narrow and fail to speak to comprehensive unit objectives. Conversely, philosophy statements tend to be too general to be usable as objectives. A way out of this dilemma is to chart out one's cooperative education effort in concert with staff. The resulting program chart might be as simple as that depicted in Figure 1. Once such a chart has been constructed, whatever its complexity, specific components of the overall co-op activity (e.g., student recruitment) can be examined as an aid to determining objectives.

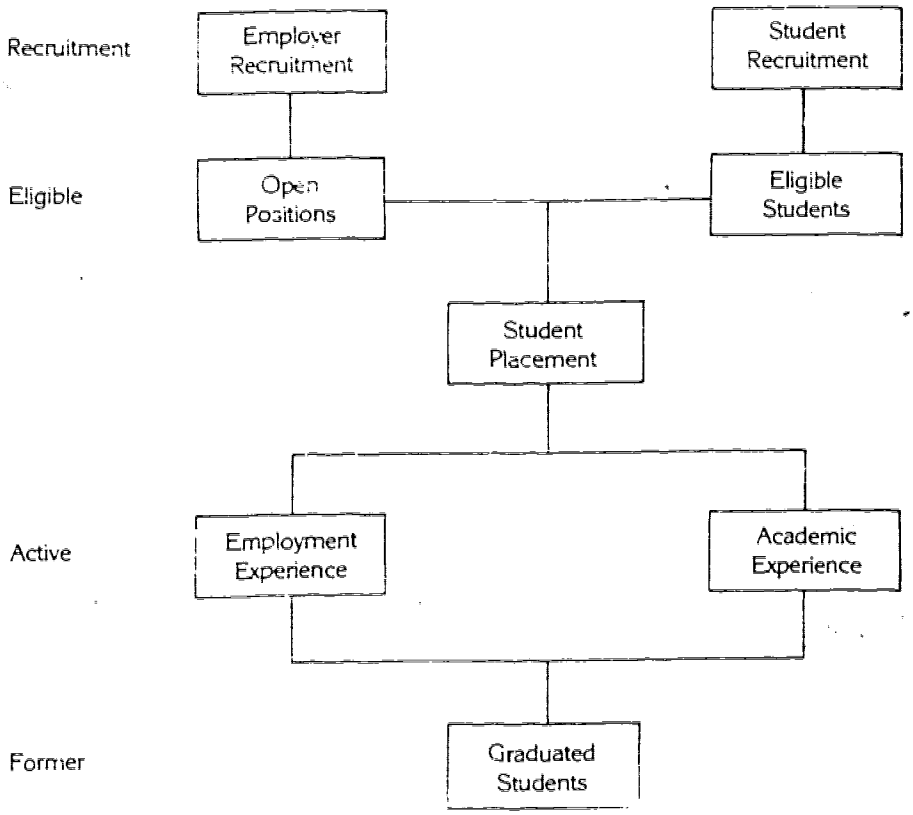
There are a number of developing measurable educational objectives. A recent [illegible] this area is **Objective Oriented Management for Cooperative Education** by Aaron D. Lucas and Daniel C. Holsenbeck.[7] They emphasize that objectives should be clearly stated, realistic, and capable of being measured. It is also important to avoid developing only objectives that speak to **process** (operations), e.g., objectives that have to do with recruiting students and employees. These objectives must be accompanied by objectives that speak to the anticipated **outcomes** of the co-op experience, e.g., student learnings that have occurred and the impact of the program as a whole upon general instructional activity. Anita J. Harrow's article on program evaluation provides a further discussion of both process and outcome objectives.[8]

Finally, because reporting requirements (e.g., Title VIII and other state and federal reports) often require extensive information about a program that may not be related to individual program objectives, it is important that response to such reports be treated as an independent process objective.

Step Two: Determine Information and Data Needs

Once specific objectives have been written, the co-op staff can determine what

Figure 1
PHASES IN THE CO-OP PROCESS



information employers, administrators, staff, and students might need to know to implement the objectives and ascertain their accomplishment. For example, if a particular student recruitment objective is "to recruit fifty students from area high schools into the college's design engineering cooperative experience," the co-op staff might want to know how many students were recruited and what percentage of students at each high school indicated program interest. They might also need to maintain a continuing contact with such interested students. To meet such information needs, it is necessary to determine what distinct facts (data) need to be collected about each student. Such data would include each student's name, address, and high school. In essence, every objective should be subjected to the following questions: What kinds of information do I need to **accomplish** the objective or to **measure** the accomplishment of this objective? What discrete data do I need to provide such information?

Figure 2 suggests a simple format for determining both information and data needs and provides a completed example.

Figure 2
CO-OP OBJECTIVES, INFORMATION, AND DATA

AREA FROM PROGRAM CHART	OBJECTIVES	INFORMATION NEEDED	DATA NEEDED
H n School Recruitment	To recruit 50 area high school students into the design engineering cooperative experience.	# of High Schools Contacted	Name of High School
		# of Contacted Students	Name of Student
		# of Students By High School	
		# of Students in Each Grade	Grade Level
		# of Interested Students	Interest in Co-op
		Mailing Labels	Address
		# Actually Entering Design Program	Social Security #

It may be helpful at this point to distinguish between "objectives" (desired ends) and "activities" (means of achieving the ends). For example, the objective "to recruit fifty area high school students into the design engineering cooperative experience" might have the following as one of its activities: "visit all high school drafting classes in the county to explain the co-op program." To accommodate this differentiation Figure 2 could be expanded to include an "Activities" column between the "Objectives" and "Information Needed" columns.

Once data needs have been determined to meet or measure the accomplishment of program objectives, it is necessary to take an interim step focusing on current data collection instruments. This review is a first step in the process of refining collection instruments and, at the same time, a way of checking on the completeness of developed program objectives and consequent data needs. When data are collected over a period of time, there is generally a reason for the collection. Consequently, pieces of currently collected data should point to established objectives and may well suggest others that need to be added to those previously drafted. In addition, a careful review of actual data collection instruments provides an overview that is essential to the instrument refinement that follows in step three.

Figure 3 suggests a format for reviewing current collection instruments. Current instruments should be identified at the top of the page and data collected on each form listed along the side. An additional benefit of this exercise is that it provides a perspective for eliminating needless data duplication.

This process of reviewing objectives and determining information and subsequent data needs is never complete, for objectives change frequently in a dynamic program. Nevertheless, it is necessary at times to stop and decide upon the precise data that will be collected for a given period of time. Once such decisions are made, collection instruments can be reviewed and the process continued. Of course, an MIS should be flexible enough to incorporate and/or eliminate data at a later time.

Figure 3
A FORMAT FOR THE REVIEW OF DATA COLLECTION INSTRUMENTS

Data	High School Recruitment Form	Application	Eligible Student Form	Active Student Form	Semester Information Report Form	Transcript					
Name	x	x	x	x	x	x					
Soc. No.		x	x	x	x	x					
Special Interest	x	x	x								
Campus		x	x	x	x						
Nationality		x			x						
Sex		x			x						
G.P.A.						x					

Step Three: Devise Methods of Collecting, Storing, Manipulating, and Reporting Information

Step three in the process is central to any MIS and at the same time quite involved. Data collection, storage, manipulation, and reporting are all interrelated. Required reports will influence data manipulation; the method of manipulation will influence storage and collection. Though each component will be separately presented, they are combined into one step to demonstrate their interrelatedness.

Data Collection Instruments and Procedures

Very often a collection instrument drastically limits the information available from the collected data. In a manual system, for example, if wage, hour, employer, and curriculum data are not part of a single collection instrument, it is very time consuming to determine the hourly wages earned, hours worked, and total income of students in a particular curriculum during a particular semester. The development of systematic and efficient information collection formats and procedures is as critical as a thorough information needs analysis. Well designed forms for the collection of data, a carefully developed procedure with timelines for the actual collection, and a specification of who will provide and who will validate data are essential for accurate and timely program information.

There are several points to keep in mind in the development of collection instruments and the data collection process:

1. **General concerns about the collection effort should be identified.**
   Student and employer input is critical at this step of the process. Who better than those in closest contact can identify problems in current instruments or in the collection process? Having involved persons identify current concerns with data collection instruments and procedures is the place to begin data collection revision.

2. **Data should be collected on carefully conceived forms.**
   The instruments that are developed for data collection should be simple, clearly presented, and easily completed. The collection system as a whole needs to be flexible in the sense that it can easily incorporate additional data as new information needs are determined. Field testing of new instruments by users is important before final formats are developed. What may be very clear to a coordinator may, in fact, be a foreign language to an employer new to cooperative education.

3. **Whenever possible, data should be collected only once.**
   Requesting a piece of data on several forms frequently results in annoyance, at times an increase in missing data, and always increased storage problems. The overall data analysis demonstrated in Figure 3 is a first step in the elimination of needless data redundancy.

4. **The individual closest to information should generally provide it.**
   In any MIS it usually makes sense to have the individual closest to a piece of information provide it. Since most co-op information concerns students and employers, it follows that they are usually the best source of the information that concerns them. Some might suspect that students are unlikely to provide accurate information or to complete forms correctly, but experience in programs that have developed a CMIS has not borne out such concern. Some information, of course, will require verification. In such cases, it is important to determine what requires verification, who will verify it and when it will be verified.

5. **Procedures are essential for a well-organized collection effort.**
   A carefully devised procedure for data collection should include collection instruments, should specify who completes and verifies information, and should stipulate a process for the regular review of the collection process itself.

6. **Methods of storing and manipulating facts will influence the instrument design and procedures.**
   A decision to use a computer to store and manipulate information as opposed to a manual storage and manipulation process will influence instrument design and procedures. For example, in a computerized MIS, a form that is designed ready for key punching will be far more efficient than a form not so structured.

The Storage and Manipulation of Data

As information needs are being assessed, data to supply that information are being identified, and the collection process is being determined, it is essential to establish how these data will be stored and manipulated to provide requested information. As in the other instances, the methodology for storage and manipulation can place restrictions on what is collected, how it is collected, and how it can be used. Historically, coordinators have determined information needs and have designed collection instruments and time lines. As a group, coordinators are probably least familiar with the varied means of data storage and manipulation. This step in the development of a CMIS often appears to be the most

difficult because coordinators are now in alien territory. However, resources are relatively available. The primary problem is to be able to ask intelligent questions about local resources, whether computerized or manual. The following suggestions will help in determining how information will be stored and manipulated:

1. **Identify available resources.**
   An individual who understands what is locally available for data storage and manipulation and is able to suggest how these resources might be best adapted to resolve present information needs is critical to this part of the MIS development. Very often such assistance is available from more than one resource. For example, some co-op directors have used faculty in data processing or computer science departments as such a resource. Institutional computer services continue to be the principal resource. In looking for available resources it is important to look within and without the institution. Occasionally major institutions have combined to provide a network of computerized resources. Private sector agencies, however, are often slow with follow-up.

2. **Use a simple system.**
   It is probably better to settle on one approach to storage and manipulation that takes care of most needs rather than to use several that are not interchangeable. As mentioned before, if demographic data about employers and students are collected separately then the possibility for their integrated interpretation is limited.

3. **Become familiar with factors involved in selection of storage and manipulation resources.**
   The choice of a specific storage or manipulation technique depends upon the type of information needed, the amount of data to be collected, and the complexity of the needed information. For example, if data are being collected to complete local, state, and federal information reports, then the required information is focused on the total population and less concerned with individual characteristics. Reports are required at regular intervals, and the required information is limited in scope. If a computerized approach to data manipulation is used, a statistical package that produces batch printed reports would be quite appropriate. However, if data are being collected to assist coordinators in the placement of individuals and a computerized approach to manipulation is suggested, then the computer software package chosen must permit rapid recall of data about individuals.

4. **Develop a manual storage and manipulation system even if computer services are available.**
   A carefully conceived, well-organized manual system is an important supplement to a computerized system. For example, such data as grade point averages are often more efficiently stored by computer, while other data, such as faculty recommendations, are better stored in a manual system (i.e., file folders).

5. **Develop well defined procedures.**
   Like an effective collection system, well developed procedures are critical to an effective and timely storage and manipulation effort. These procedures should inform all concerned staff as to how data are to be stored (e.g., on computer or in file folders), how they will be manipulated to provide necessary information, when they will be manipulated, and who will manipulate them.

6. **Estimate future storage needs.**
   In choosing a particular method for storing information, it is important to estimate and plan for long range storage needs. It is important to determine which types of data will be retained and for how long.

7. **Relate manipulation reporting needs.**
   Reporting requirements and a format for reports will influence the choice of manipulation techniques. For example, computer programs frequently can be adjusted to print results of manipulation in a report ready format.

The Reporting of Information

As mentioned previously, very often coordinators fail to **report,** or report **clearly,** information about their program activity to the appropriate people. Data are collected, stored, manipulated, and even at times reported statistically to state and federal agencies. Still coordinators fail to assemble the information and understand implications suggested by the collected data. If cooperative education is to receive significant support, then its outcomes must be well presented at individual institutions and nationally. The following points about reporting are simple but appear to be frequently overlooked.

1. **Information should be clearly and succinctly presented in a standardized format or a regular schedule.**
   All of us have probably had the experience of skimming a ten-page report and wondering what it said, only to read carefully a one- or two-page report that followed with good comprehension. Reports should be to the point and unambiguous. The implications of the data should be clearly presented. The report format should be clear and easily interpreted by educators, students, and employers alike. Furthermore, a standardized reporting format over a period of time permits comparison and contributes to overall program understanding.

2. **Key employers, faculty, and administrative decision makers should receive program reports.**
   It is far more important to single out a handful of key people with whom to share program information rather than to spend time with broadsides to all in sight.

3. **Information reports should be regularly reviewed.**
   It is good to occasionally review program reports with those who regularly receive them. Whether information is of use, how it is being used, and whether additional information might be helpful are important questions to ask.

4. **Reporting procedures must be clearly established.**
   It is essential to determine which reports will be presented, who will receive these reports, and how they will be stored.

Step Four: Develop a Plan for Utilizing Information

Utilization of information is the end result and primary rationale for an MIS. Very often available information is not used in program activity establishing direction for individuals or in general planning and development. The following principles are suggestions for achieving maximum utilization of information:

1. **Develop a clear plan for the utilization of information.**
   It should include regular intervals for the discussion of the implications of the available information and the consequent amendment of program direction.

Figure 4
INFORMATION PROCESS REVIEW

OBJECTIVE: _____

INFORMATION

What information is needed to help meet the objective or to determine if the objective has been attained?

_____

DATA

What data are need to generate this information?

_____

COLLECTION

On **what form(s)** will the data be collected? _____

Who will provide the data? _____

When will it be provided? _____

Who, if anyone, will validate the date? _____

STORAGE

How will the data be stored? (manually, on computer, or both) _____

MANIPULATION

How will the data be manipulated to provide necessary information? (manually or by computer) _____

When will it be manipulated? _____

Who will manipulate it? _____

REPORTING

How will the information (manipulated data) be reported? _____

_____

To whom will it be reported? _____

When will it be reported? _____

UTILIZATION

How will the information be used in program planning?

_____

The process of developing an MIS is all encompassing and will affect the entire cooperative program. Though the task is demanding, the experience of those who have developed a CMIS indicates that it is well worth the effort.[10]

2. **Use an Information Management Calendar.**
   One way to insure that you **do** assess your program's progress toward its objectives is to review annual objectives and develop more specific monthly activities that become a part of a Management Information Calendar. At the beginning of the following month, progress on the past month's activities is reported and new activities are stated. At the end of the year such a calendar becomes a record of activity and a basis for the review of past objectives and the development of new objectives.

3. **Efficiency and effectiveness of an established MIS should be reviewd regularly.**
   As mentioned previously, CMIS is tended to provide "the **necessary** information at the proper **time** and **place** so as to enable the effective **management** of all facets of an organizaton."[9] It is important that a CMIS be assessed regularly to see if, in fact, it is contributing to the overall effectiveness and efficiency of the program.

Conclusion

This paper has attempted to establish a perspective for the utilization of the MIS concept in programs of cooperative education. It has detailed common weaknesses in cooperative education information management and suggested how they can be overcome through an MIS. Finally, it has presented a process for MIS development that involves specifying objectives; identifying information and data needs; determining data collection, storage, manipulation, and reporting methods; and deciding how the MIS will assist in daily program objectives and overall planning. This process is summarized in Figure 4, which provides a format for dealing with each objective in a thorough manner.

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[8]"Program Evaluation," *New Directions for Experiential Learning*, No. 2: *Developing and Expanding Cooperative Education*, Jossey-Bass, Inc., Publishers, 1978, pp. 37-41.

[9]Voich, Mottice, and Shrode, p. 2.