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FACTORS RELATED TO USER SATISFACTION
OF STATE EXTENSION MANAGEMENT INFORMATION SYSTEM
IN THE COOPERATIVE EXTENSION SERVICE

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FACTORS RELATED TO USER SATISFACTION OF A STATE

EXTENSION MANAGEMENT INFORMATION SYSTEM IN THE

COOPERATIVE EXTENSION SERVICE

By

Harlem D. Sandberg

A DISSERTATION

Submitted to
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and Higher Education

1979

ABSTRACT

FACTORS RELATED TO USER SATISFACTION OF A STATE EXTENSION MANAGEMENT INFORMATION SYSTEM IN THE COOPERATIVE EXTENSION SERVICE

By

Harlem D. Sandberg

The purpose of this research was to determine the relationships of selected human and organizational factors on user satisfaction of a State Extension Management Information System. By identifying factors which are contributing to dissatisfaction with SEMIS, then appropriate CES management can make necessary decisions that will help improve SEMIS and thereby improve its utility as a management tool.

Via literature review 15 human and 42 organizational factors were selected as the independent variables for the study and by logical analysis were placed into nine groups. The human factor groups were attitudes toward cost, employee relationships and demographic variables. The organizational factor groups were system design input quality, system design output quality, training and ongoing user assistance, management attitudes, system security/ computer compatibility, decision making/organizational purpose, and system (SEMIS) purpose.

User satisfaction was identified as the dependent variable and was measured by a satisfaction score on question one and by the combined score on questions one through twelve of the research instrument.

The research instrument used was a mail questionnaire which was sent to 138 full and part-time professional CES employees in one state. One hundred thirty-two completed questionnaires were returned (95%) and comprised the research sample.

Nine separate hypotheses were formulated and tested in the study. Hypothesis 1 was tested via Multiple Regression Analysis and Hypothesis 2 was tested via Multivariate Analysis of Variance. Tests of the hypotheses yielded the following results at the .05 level of significance.

Hypothesis 1: User satisfaction can be predicted by employee relationships, training and ongoing user assistance, system design input quality, and to a less degree by management attitudes and system design output quality. The predictor variables system (SEMIS) purpose, decisions making/organizational purpose, system security/ computer compatibility and cost failed to predict user satisfaction with SEMIS.

Hypothesis 2a: User satisfaction was significantly related to users employment position. Specifically, administrators were more satisfied with SEMIS compared to county agents and specialists, and county agents were more satisfied with SEMIS than specialists.

Hypothesis 2b: User satisfaction was significantly related to users years of employment. Specifically, employees who had 21-25 years of employment with CES were significantly more satisfied with SEMIS than those who had 0-20 years of employment.

Hypothesis 2c: The relationship between user satisfaction and users age was found not significant.

Hypothesis 2d: User satisfaction was significantly related to highest academic degree held. Specifically, users holding bachelors or masters degrees were significantly more satisfied than those holding a doctorate degree.

Hypothesis 2e: The relationship between user satisfaction and area of highest academic degree was found not significant.

H2f: The relationship between user satisfaction and total number of employees in users office was found not significant.

Hypothesis 2g: The relationship between user satisfaction and the position of office chairperson and nonchairperson was found not significant.

DEDICATION

To my mother and father who have always encouraged me to go to school. Not once did they ever discourage my desire to "go on" to college or to continue on for another degree.

To my family who have had to endure much through this doctoral degree program. Only they know what it is like from their perspective. Margaret, you have extended yourself unselfishly in providing love, reassurance and support for your husband and our children. Tecla and Todd, you have shown much patience and understanding when Daddy had to go and study. No longer will you need to ask, "Daddy, are you going to work on your dissertation?" Once again my family can become the center of my life.

To my late mother-in-law, Mrs. Marion Parker and my father-in-law, Dr. Floyd G. Parker for their loving care and support.

ACKNOWLEDGMENTS

The researcher wishes to thank his doctoral committee for their guidance and support of this research project:

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Dr. Iwao Ishino, for his critical and systematic analysis of the research effort.

Also, former committee member and now retired, Professor Russell Kleis, for his scholarly advice.

The researcher also wishes to thank Mr. James B. Douglass, statistician, for his excellent help and Mr. Madhi Ghodes, fellow graduate student, for his superb assistance in doing the computer runs.

The researcher is indebted to the Cooperative Extension Service faculty of Sample state for their cooperation in completing the research questionnaire.

Appreciation is also expressed to the University of Alaska for sabbatical leave during which this doctoral program was begun.

Special thanks to Dr. James W. Matthews, Director, Cooperative Extension Service for all his support and encouragement.

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CHAPTER I

INTRODUCTION AND BACKGROUND

Today, from a management perspective, the concept of accountability is prevalent within governmental or public institutions. Within the field of education, be it formal or informal, boards, presidents, chancellors, superintendents, directors, and teachers are all being asked for accountability in expenditure of funds, public and/or private. People are not only conscious of the cost of education, but are looking at the end product of its investment, the student or audiences served. Educational needs for a society change over time and competition for resources to mount programs to meet the various needs have increased at all levels of government.

Development of the Extension Management Information System

The Cooperative Extension Service (CES), an adult educational agency, is experiencing this competition for public funds while at the same time finding the demand for its services increasing:

> In the 60's legislative bodies at all levels began
> to demand accountability, not for new funds but for funds
> already in hand. This situation is illustrated by the
> fact that nationally the size of the Cooperative Extension
> staff hasn't changed much since 1961. Increases in
> Extension funds came in areas of national concern, such as
> expanded nutrition and pesticides. The trend for increased

1

emphasis on accountability will probably continue. There-
fore, it demands continued attention (Lutz and Swoboda,
1972, p. 45).

Accountability for the Cooperative Extension Service means providing

a credible demonstration of accomplishments toward objectives stated

and implied in its enabling and subsequent legislation (p. 45).

Several programs dealing with accountability but called by

different names include program budgeting, cost effectiveness, and

zero based budgeting. These all have the same intent which is to

demonstrate accountability (p. 45). But accountability goes beyond

just showing, for example, how efforts were expanded. It is directly

related to management and involves not only the managers but the

management process which ultimately is concerned with results.

Additionally, ". . . a major consideration in moving toward account-

ability must be development of information systems, including the

data gathering and analytical activities needed to support them"

(Barro, 1973, p. 125).

At the federal level, the search for a mechanism to
control funds was most visible in the Department of
Defense under Secretary Robert McNamara, in the form of
program budgeting.

President Johnson expanded this idea to include all
agencies of the federal government. Thus, the USDA and
its agencies were brought into such a system.

With this action, along with earlier planning, the
federal administrators of Extension developed the
Extension Management Information System (EMIS) for the
total agency, along with its counterpart in each state
referred to as SEMIS (State Extension Management
Information System). The EMIS/SEMIS concept was "one of
the first steps taken to evaluate the effect of govern-
ment spending, from a management approach" (Lutz and
Swoboda, p. 47).

More explicitly SEMIS is a management information system (MIS) which is used as a tool in the management process. It is a computer assisted management information system designed to provide management information to CES staff members at county, regional, state and national levels.

State Extension Management Information Systems (SEMIS) are operational in fifty states, Puerto Rico, District of Columbia and the Extension Service, USDA. The national Extension Management Information System (EMIS) is composed of the fifty state systems. Each of these entities operates a SEMIS specifically designed for its needs and has the capability to collect, store and retrieve data.

The CES Management Information System was designed to assist CES Management in areas which include:

1. Development of short- and long-range plans that reflect national goals, state targets and local needs.

2. Determination of alternatives in resource organization and allocation.

3. Determination of progress in achieving stated purposes and objectives at all CES levels.

4. Determination of resource expenditures associated with specific purposes and objectives (Rosenberg, Davis, Landacta, Muller, Radness and Walter, 1967, p. 1).

The basic information fed into SEMIS includes the tasks or educational plans developed by the staff member. Usually each staff member has several tasks which constitute his plan of work for the fiscal year. The SEMIS activity report is the "follow-up" information system. It records how staff members expend their time based on the above identified divisions. Computer printouts portray in

selected ways how the staff plans its efforts and how they have expended them.

Since the advent of EMIS/SEMIS in the later sixties, it has undergone three modifications. In fiscal year 1967 EMIS data collection was eliminated. At the same time the Extension Service (ES), Washington, D.C., requested less data on planning and time expended from each state because the USDA required less data and on a slightly different basis. That change essentially amounted to combining two major categories of task and activity input information into a new category. One implication of that change is to modify SEMIS accordingly. Although the Extension Service did not recommend that SEMIS Version III be altered as a result of these recommendations, it did instruct the states how to convert SEMIS data into the revised component category. Interestingly a few states viewed this request for modified data as an opportunity to revise their SEMIS format which actually amounts to a fourth revision of SEMIS. These alterations illustrate that SEMIS is a flexible system.

Response to the State Extension Management Information System

The response to SEMIS by CES staff nationally has varied. In Minnesota a survey of CES staff showed that a negative feeling was dominant and that there was polarization of feelings toward SEMIS (Keel, 1973). Both county staff and state specialists were negative toward the system with the polarization more pronounced among state specialists as a group. Administrators generally were supportive of SEMIS.

In a single-state survey conducted in Tennessee (Henderson and Carter, 1975, p. 3), the majority of the Extension staff surveyed (71 percent) felt the purpose of the weekly activity report was to keep a record of time spent or show what was done. Additionally, they felt the report was aimed at the state and/or national administrative level (57 percent) rather than the county (15 percent). Eighteen percent felt it was aimed at all levels while 7 percent felt it was aimed at both state and county levels. A majority of the Extension Staff (54 percent) felt that the staff time expended to complete the weekly activity report was justified by their present use of the printout data. Thirty-two percent of the staff felt that the staff time expended to complete the weekly activity report was justified by their present use of the printout data while 9 percent of the staff felt it was a questionable use of their time (p. 3).

Regarding uses made of the printout data, reporting was most frequently mentioned (39 percent) followed by using the data to compare expended time with planned time (25 percent). Of the remaining ten staff members (35 percent), nine used the data in conjunction with evaluation, planning or a combination of evaluation, reporting and planning while one had not used the data. Regarding usefulness of the data to show accomplishment of objectives, the staff members were nearly equally split in their opinions but they were almost totally in agreement that the data could not be used to reflect the effectiveness of activities conducted (p. 3).

During the 1973 Extension Winter School where twenty-two Extension professionals representing fifteen state Extension Services were asked to respond to three statements relating to SEMIS, one statement was "What I like or dislike about SEMIS." Dislikes of SEMIS accounted for the majority of the responses. Some responses were:

> Despite the fact that SEMIS is an easier method of reporting for me, I still don't feel it serves much purpose for me.

> It seems to me that it does not reflect quality of programs as it should.

> After reporting by number I cannot analyze and review any program progress. In other words, the reporting system is meaningless.

> It isn't a qualitative indication of the programs but rather is a quantitative one. Printouts arrive months afterwards.

> Dislike time in keeping it and coding is not permanent and does not give a true picture of program planing.

> SEMIS categories are difficult to use because more of the work does not seem to come under any of them.

> We were initially supposed to be relieved of our terminal reports. Ha! Now we have SEMIS, progress, terminal, and special (then they usually ask us to repeat).

> Numbers are too broad--difficult to 'pinpoint' activities. It's another report. I just don't like reports.

> I think SEMIS would mean something if it were used properly. It should be related to program - plan of work - progress - civil rights and nondiscrimination - county situation and become one part of the program development process.

> The program as it is now managed does not provide information often enough or on enough relevant subjects to provide the agent with relevant information.

> Dislike it because I have not really learned how to use it (Soobitsky and Lukens, 1973).

Apparently much dissatisfaction was expressed among state cooperative extension services during 1975 which in turn resulted in a letter to State Extension Directors from ES Administrator Kirby (1975) in which he stated the following:

> For the past several weeks there has been much discussion about the future of EMIS/SEMIS. This is to confirm and re-emphasize my comments at the Land-grant Meeting on the need for maintaining and strengthening our Extension Management Information System.

Kirby appointed a committee whose purpose was to recommend policy regarding program data and information needs within ES-USDA which in turn should enhance the effectiveness of SEMIS.

CES-sponsored conferences on SEMIS which this researcher has attended have focused on the problem areas of acceptance, operation and design. Also, comments heard by this researcher about SEMIS when interacting with CES staff from various states are usually negative.

Need for the Study

Currently the situation relevant to SEMIS research is as follows:

1. SEMIS has been operating for nearly a decade and yet few indepth empirical studies of the system have been conducted despite the current concerns. The surveys mentioned above and two other Tennessee studies (McBroom, Jr., Carter, Jr., and Datson, 1972;

Gault, 1976) are apparently the only systematic research which have been done on SEMIS and which was done on Version II. No systematic research has been done on Version III.

2. SEMIS is an extensive system in which each state and the Extension Service, Washington, D.C., have invested considerable resources in materials, manpower, and time. With nearly a ten-year history the system now is receiving considerable review nationally and there is little evidence to indicate a few states have modified the system substantially. This has resulted in less information being made available than before. At the national level EMIS data were last generated in fiscal year 1976 via automatic conversion of SEMIS data.

The scarcity of research indicates that no in-depth empirical studies have been done on SEMIS, yet, the system has undergone three revisions and there is the potential for yet a fourth. This all occurred without the aid of empirical research. SEMIS is in the operational phase and consequently empirical research can aid in its improvement. The ability to determine reliable ratings of satisfaction will help identify problem areas, or in this case selected human and organizational factors, which apparently are contributing to dissatisfaction with the system. This in turn should help appropriate CES management to make better decisions in its attempt to improve SEMIS. An improved SEMIS, in turn will further help CES in demonstrating accountability. In addition, it is anticipated this study will contribute to the research on management information

systems, especially those used in education and particularly by large-scale adult educational organizations.

Purpose

Eminating from previous research, the central question providing the basis for this study is, "What factors contribute to dissatisfaction of SEMIS among CES staff?"

The literature shows that the measurement of user satisfaction is one method of assessing operational feasibility of a management information system. According to Ahern, McIntyre, Sand and Thomas (1977):

> Ideally . . . the only factors affecting satisfaction are how well the users' needs were reflected in the formal system objectives and how well the system design met those objectives. However, other factors will affect satisfaction; they should be identified and measured (p. 6).

The literature review identifies many factors which affect users' satisfaction with an MIS. This study will include selected human and organizational factors. Human factors include: (1) employee relationships, (2) user attitude toward cost, (3) user attitude toward computers, and (4) demographic data. Organizational factors include: (1) systems design factors, (2) training and ongoing user assistance, (3) management attitudes, (4) data security, (5) user perceptions of how the system is used in decision making, (6) user perceptions of how it serves the purpose of the organization, and (7) user perceptions of the degree to which it fulfills the purpose for which it was designed.

The purpose of this study is to determine the relationships of selected human and organizational factors on user satisfaction of a State Extension Management Information System. User satisfaction in this research is a general term to describe how well users feel the system meets their needs (Ahern et al., p. 1). One method to determine user satisfaction is to measure the attitudes of individual users. Attitudes in this research refers to an individual's belief, opinion or mood.

Hypothesis

The general hypothesis for this study is that a relationship exists between user satisfaction scores and selected human and organizational factors in a Cooperative Extension Service State Extension Management Information System.

Limitations

The population for the study included all full and part-time Cooperative Extension Service Staff of one state who are users of SEMIS. The population did not include paraprofessionals and nutrition aides.

In structuring the sample for this research, Extension Service staff, Washington D. C. was asked to identify one or more states with moderate CES staff size which were using Version III of a smoothly operating SEMIS system. Three states were identified from which the researcher chose "Sample State" (it was requested that the identity of the state not be revealed to protect staff

anonymity). It was chosen because it had the most typical operating Version III of SEMIS, because the state was very willing to cooperate in this research, which apparently contributed to a very high return level of the questionnaire, and because its moderate size staff (approximately 150) provided an adequate size sample for statistical analysis.

The study is limited to the State Extension Management Information System. It does not include EMIS.

The data employed in the analysis are limited to the State Extension Management Information System.

The data employed in the analysis are limited to these obtained from the research questionnaire completed by the full and part-time CES staff of one state.

Assumptions

This study is based on the following assumptions:

1. That Cooperative Extension Service needed a management information system to demonstrate accountability.

2. The SEMIS system was designed to meet this need for accountability.

3. That CES staff provides data appropriately and accurately into the system. During the operational phase, the effectiveness of the system is dependent primarily upon each staff member who collects and submits data into the system.

Definitions

Cooperative Extension Service (CES)--The informal educational organization of the United States Department of Agriculture, whose purpose as defined by the Smith Lever Act of 1914 is to disseminate information on agriculture, home economics and related items to the people. The state office is located in each state's land-grant university and field offices are located in each county of the states.

"Extension Management Information System (EMIS)--The part of the (computer assisted) national management information system data base specifically designed for ES-USDA to. systematically collect and analyze aggregated data from state Extension educational programs for utilization in program management and administration" (Lawrence, 1974, p. 14).

"State Extension Management Information System (SEMIS)--The part of the (computer assisted) state management information system data base specifically designed for state and local planning units to collect and analyze Extension program data for utilization in program development and program administration" (Lawrence, 1974, p. 16).

"Program Development--The continuous series of processes which includes organizing, planning a program, preparing a plan of work and teaching plans, implementing the plans, evaluating, and reporting accomplishments," (Lawrence, 1974, p. 15).

"Plan of Work (written document)--A written outline of strategy for one year or less for each problem or concern involved in a program that sets forth in an integrated and coordinated manner the following elements: 1) educational, operational, and/or organizational objectives to be achieved; 2) learning experiences, activities, events, and/or situations to be undertaken, calendarized, and related to appropriate objectives; 3) evidence of accomplishments, kind of, and calendar for evaluation; 4) time to be devoted to each activity, event, and/or learning situation; 5) who will assume primary and support leadership responsibilities; and 6) coordination, internal and external" (Lawrence, 1974, p. 15).

Human factors--The factors or independent variables in this study which are initially based in the individual user. That is, the user provides these factors, i.e., demographic data, employee relationship, etc.

Organizational factors--The factors or independent variables in this study which are initially based on the organization. That is, the organization or the management of the organization provides these factors, i.e., purpose of the organization, training, etc.

Version I--The original version of the Extension Management Information System. It was field tested in several selected states and with federal Extension Service employees.

Version II--The second version of the Extension Management Information System. It was a modification of Version I and was the version implemented nationally.

Version III--The third version of the Extension Management
Information System. It was a modification of Version II with substan-
tial changes, including: addition of data fields, addition of English
language, explanation of numerical codes in printouts and increased
flexibility in data handling.

Overview of the Study

The thesis is organized into five chapters. The introductory
chapter presents the background of the problem, the purpose of the
study, the hypothesis, limitations, and definitions. Chapter II
reviews the literature on management information systems and explains
the State Extension Management System. Chapter III describes the
design of the research and the methodology of the study. It
identifies the population and explains the research hypotheses,
variables and instrument, and statistical analysis. Chapter III
also looks at the differences between this study and others examining
user satisfaction. Chapter IV presents an analysis of the data.
The final chapter details the conclusions of the study, offers recom-
mendations and implications for further research and summarizes.

CHAPTER II

LITERATURE REVIEW

Introduction

Management Information Systems are inherently related to

management. The literature abounds with definitions of management

with it frequently defined simply as "getting things done through

people." But scholars view management as more complex and involved.

Shrode and Voich (1974) tie together the concepts of input, output

and organization in their definition as follows:

> . . . management can be viewed as a set of activities
> or a process for coordinating and integrating the use of
> resources to accomplish organizational purpose (producti-
> vity and satisfaction), through people, via techniques
> and information, and in an organized structure (p. 7).

Johnson, Kast and Rosenzweig (1967) assert that the manage-

ment process involves relating three unrelated resources: men,

machines and money, into a total system for objective accomplishment.

And Hostrop (1973) relates management to accountability by saying,

"Management is the acceptance of personal accountability determined

by measurable results" (p. 3).

In the study of management as a process, authors delineate

the functions of management in various ways. For purposes of this

research, the major functions of management are defined as "planning,

organizing, staffing, directing and control" (Koontz and O'Donnell,

1968, pp. 47-48). The manager performs these functions and common

functions of management according to Brown (1972) are:

1. Developing purposes and objectives
2. Setting frames of reference
3. Forecasting and planning
4. Arranging for financing
5. Organizing
6. Obtaining and developing personnel
7. Coordinating and informing
8. Guiding and leading
9. Surveying performance; auditing
10. Testing and evaluating
11. Adjusting and integrating
12. Insuring proper external relationships (p. 16).

Despite the fact that basic management functions or principles

are common to private and public organizations, it is important to

note that public management differs from corporate management in

several ways as Bower (1977) indicates:

Public sector managers frequently must:
- Accept goals that are set by organizations other than their own.
- Operate structures designed by groups other than their own.
- Work with people whose careers are in many respects outside management's control.
- Accomplish their goals in less time than is allowed corporate managers (p. 134).

Management Information Systems

This literature review of Management Information Systems

(MIS) is not necessarily concerned with the technical and economic

aspects of a computer-based management information system, rather it

is mainly concerned with its operational aspects. Historians have

traced record-keeping back to the Babylonians in 3500 B.C. whose

merchants kept records of wealth on clay tablets. Early systems of

mathematics have also been traced back to this same time period. However, it took another 2000 years for the alphabet to be developed by the Phoenicians. These two developments are the basis for all subsequent developments in data and information processing (Burch and Strater, 1974, p. 4). Throughout history the need for more management information has increased, particularly since the industrial revolution (Murdick and Ross, 1977, p. 1) and more recently due to the increased regulation of society in general by governmental agencies (Burch and Strater, 1974, p. 5). The use of the computer as a management tool originated in the mid-1950s and since then has experienced explosive growth (Matthews, 1976, p. 6).

Objectives

The fundamental purposes of an MIS are to (1) provide timely information to management, (2) aid in the allocation of resources, and (3) aid in the selection of alternatives (Head, 1972, p. 7). Put another way, "its primary purpose is to provide information for decision making and coordination" (Emery, 1969, p. 34).

Ross (1976) ties the objectives of an MIS to management functions as follows: "The objective of an MIS is to provide information for decision making on planning, initiating, organizing, and controlling the operations of the sub-systems of the firm and to provide a synergistic organization of the process" (pp. 8-9).

Who then are the users of an MIS? The major users of an MIS are summarized in Table 1.

TABLE 1.--Major Users of Management Information Systems.

User	Uses
Clerical personnel	Handling transactions, process data and answer inquiries.
First-level managers	Obtaining operations data. Assistance with planning, scheduling, identifying out-of-control situations and making decisions.
Staff specialists	Information for analysis. Assistance with analysis, planning and reporting.
Management	Regular reports. Special retrieval requests. Special analyses. Special reports. Assistance in identifying programs and opportunities.

SOURCE: Davis (1974), p. 103.

Definition

The literature contains numerous definitions of management information systems ranging from complex to simple or comprehensive to basic. Kanter (1977) defines an MIS as "a system that aids management in making, carrying out and controlling decisions" (p. 1). Murdick and Ross (1977, p. 1) diagrammed an MIS as shown in Figure 1. In addition they state:

> . . . the MIS has the purpose of assisting managers to make decisions. While all workers make decisions, manager's decisions are concerned with planning for, directing, and controlling work groups. They make decisions on longer-term and broader-scale issues than the individual machine operator, clerk, technician, professional, or staff consultant.

```
                    ┌─────────┐
                    │   MIS   │
                    └─────────┘
                         │
        ┌────────────────┼────────────────┐
┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│ Management   │  │ Information  │  │   System     │
└──────────────┘  └──────────────┘  └──────────────┘
```

| 1. Makes decisions regarding:
 - Planning
 - Operating
 - Controlling | 2. Information con- sists of orderly selected data used for making decisions | 3. Systems for integration of all company activities through exchange of information |
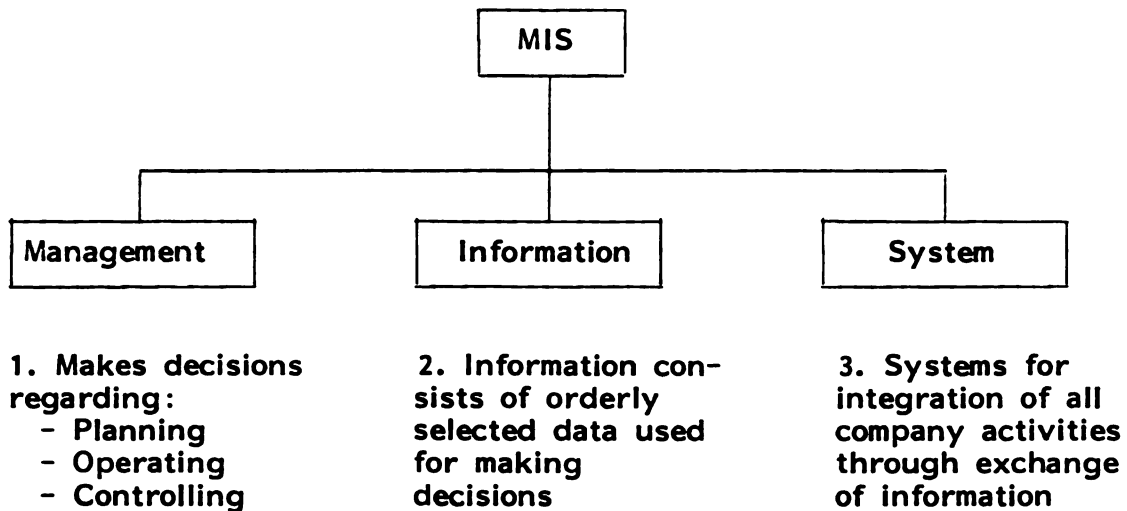
FIGURE 1.--Diagram of an MIS

Second, the MIS has the purpose of providing selected data, i.e., information to managers at a time when they are useful in aiding the managers to make decisions. In fact, parts of the MIS may be designed to provide decisions for repetitive classes of problems.

Third, the MIS provides information to all managers so that all company activities may be tied together to operate the company as a system (pp. 8-9).

Alexander (1974) focuses on the output of an MIS, information, in his definition by stating an MIS is:

. . . any information system that provides a manager with information on the activities and pertinent inter- relations about the current status of the production/opera- tion system over which he has authority. The basic objec- tive is to provide the manager with complete, accurate, and timely information relating to the performance of the organization (p. 100).

Models

The literature consistently points out that an MIS is a system. It exhibits the basic properties of systems: purpose, wholism, openness, transformation, interrelatedness and control. The basic model of an MIS is shown in Figure 2 (Davis, 1974, p. 103).

Taking this basic model and introducing the function of control which relies on feedback, evaluation, and adjustment (Voich, Homer, and Shrode, 1975, p. 36) produces the model in Figure 3.

Underlying Concepts

Because an MIS is related to the organization and to human processors within it and several concepts are involved in understanding an MIS. These are summarized with comments in Table 2.

As has been explained, the output of an MIS is information. According to O'Brien (1975, p. 5), "An MIS should provide management with information (and information analysis techniques) about the internal operations of the business system." This includes information on activity, status, resources, and their allocation, and planning and control. In addition, the MIS should provide information from the business environment, that which is external to the organization.

The outputs of the "MIS should provide management with information 1) on demand, 2) according to the predetermined schedule, or 3) when exceptional conditions occur" (p. 5).

THE BASIC INFORMATION SYSTEM MODEL

```
┌──────────┐        ┌──────────────┐        ┌───────────────┐
│   Data   │───────▶│  Processing  │───────▶│  Information  │
└──────────┘        └──────────────┘        └───────────────┘
```

BASIC MODEL WITH DATA STORAGE

```
                    ┌──────────────┐
                    │ Data Storage │
                    └──────────────┘
                           ▲
                           │
                           ▼
┌──────────┐        ┌──────────────┐        ┌───────────────┐
│  Inputs  │───────▶│  Processing  │───────▶│    Outputs    │
└──────────┘        └──────────────┘        └───────────────┘
```
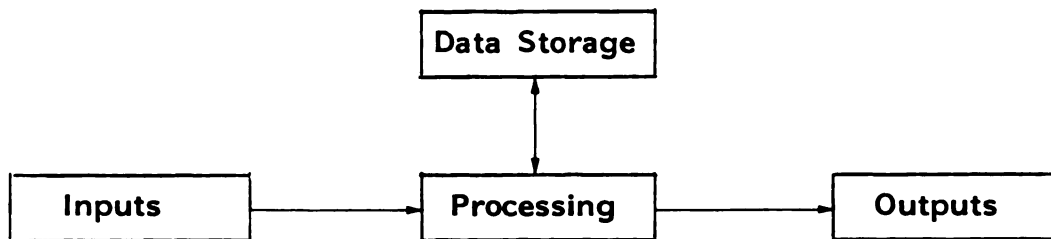
FIGURE 2.--Basic Model of an MIS

```
                    ┌──────────────┐
                    │     Data     │
                    │   Storage    │
                    └──────────────┘
                           ▲
                           │
                           ▼
┌──────────┐        ┌──────────────┐        ┌───────────────┐
│  Inputs  │───────▶│  Processing  │───────▶│    Outputs    │
└──────────┘        └──────────────┘        └───────────────┘
      ▲                    ▲                         │
      │                    │                         ▼
Adjustment◀──────────── Evaluation◀──────────── Feedback
```
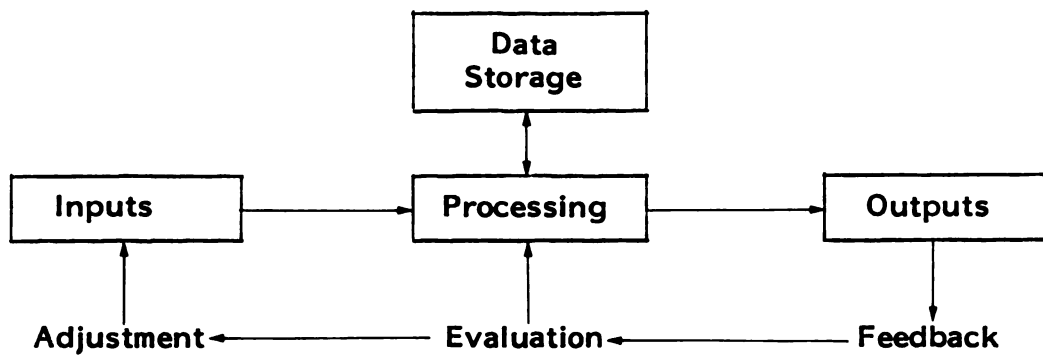
FIGURE 3.--More Complex Model of an MIS

TABLE 2.--Management Information System Concepts.

Concept	Comments
Information	Information is that which adds to a representation. It has attributes of age and quality.
Humans as information processors	The capabilities of humans as information processors impose limitations on information systems and suggest principles of their design.
System concepts	Because a management information system is a system, the concepts of systems are useful in understanding and designing approaches to information system developments.
Organization and management concepts	An information system exists within an organization and is designed to support management functions. Information is an important determinant of organizational form.
Decision-making concepts	MIS design should reflect not only rational approaches for optimization but also the behavioral theory of organizational decision making.
Value of information	Information changes decisions. The changes in the value of the outcomes determines the value of information.

SOURCE: Voich, Mattice and Shrode (1975), p. 36.

User Satisfaction Studies

Garino (1977) noted a management information system's performance can be assessed by its technical, economic, and operational feasibility. Technical feasibility can best be assessed by using information theory and economic feasibility can best be addressed by using the more statistical methods of decision theory. Operational feasibility can be assessed by several different approaches including: determining adequacy or relevancy of output data from the MIS for its users and determining adequacy or relevancy of output data from the MIS for its users and determining degree of interaction between specialists and management (pp. 35-36).

Other ways of assessing operational feasibility include assessing the use of MIS data in the decision-making process and measuring user satisfaction. Adams (1973, p. 1) asserts user satisfaction is one of several components of system effectiveness while Seward (1973, p. 136) considers user satisfaction to be a feasible substitute for measuring overall effectiveness of the information system.

Ahern et al. (1977) studied user satisfaction of an MIS in private industry. They related outcomes to inputs and took the position that user attitudes are part of satisfaction and that the attitudes will be mirrored in usage statistics. Their findings show job satisfaction was related to user satisfaction, but there was no relationship to organizational climate. Our findings include employee position related to user satisfaction, while age and longevity were the only two demographic factors that related to user satisfaction.

Factors included in the above study by Ahern et al. (1977) were system design--report format, content, flexibility, timeliness, accuracy, completeness, and understandability; job satisfaction; perception of overall organization climate; factors at the interface between system function and user--training program, written instructions, ongoing user assistance and general perceptions of the quality of the information systems function; demographic data--age, longevity with the firm, division, and job category; general attitudes toward computerized systems (p. 6).

The research questionnaire in the above study (p. 20) included user satisfaction questions developed by Jenkins (1977). They found a positive correlation between the Jenkins questions and an independent measure developed by the private industrial firm whose MIS was being studied.

Guthrie (1979) surveyed middle managers and found that MIS user attitudes are determined by organizational environment rather than by personal background. The determinants included organization size, job functions, length of service, systems experience, information systems change experience, participant's experience, MIS familiarity and recent management training.

Ahern et al. (1977) report that Lucas' dissertation uncovered attitudes which bear upon user satisfaction. Lucas focused on all levels of employees and looked at both the data processing and non-data processing parts of the organization. He predicted the following five relationships: (1) The perceived quality of data-processing

service will be directly related to attitudes toward the computer and staff. (2) The greater the perceived management support for the computer, the more favorable the attitudes will be toward data processing. (3) The more involvement in the design of new computer systems, the more favorable the attitudes will be toward the computer and staff. (4) The more contact with data processing, the more favorable the attitudes toward the computer and staff. (5) Older employees and those with longer service will have less favorable attitudes toward the computer than younger employees. The study strongly supported the first two, the third was partly supported, the fourth was more or less contradicted and the fifth was unsupportable.

Sartore (1976) found administrative support for an MIS is strongly related to user satisfaction and somewhat related to the performance of the MIS user.

For Seward (1975) user satisfaction is a surrogate for over-all information system effectiveness. It can be determined by evaluating the outputs (printouts) via measures of content, degree of currency, format, level of detail and mode of dissemination (p. 132).

McClurg (1977) studied computer assisted management informa-tion systems in public higher education and found the greatest problem in utilization was with the complexity of input requirements. Other problems included financial constraints and the resolution of policy related to the MIS. In the same study, McClurg reports users indicated the greatest utility of the MIS was in the areas of

keeping records and generating reports, value as an analytical tool,
producing information for decision-making, and for institutional
research.

As a result of substantial research, Lucas (1975) concluded

> . . . that the major reason most information systems
> have failed is that we have ignored organizational behavior
> problems in the design and operation of computer-based
> information systems. If steps are not taken to understand
> and solve these organizational behavior problems, systems
> will continue to fail (p. 6).

Lucas focused his research on three crucial classes of vari-
ables: user attitudes and perceptions, the use of systems, and per-
formance (p. 20). He studied the relationships between the variables
by developing and testing sixteen propositions via six studies over a
four-year period which involved over 2000 users of systems in field
and laboratory settings. The propositions are as follows:

User Attitudes and Perceptions

Proposition 1
   The systems design and operations policies of the infor-
mation services department and the execution of those poli-
cies influence the technical quality of information systems.

Proposition 2
   The systems design and operations policies of the infor-
mation services department influence user attitudes and per-
ceptions of information systems and the information services
staff.

Proposition 3
   User contact with information services staff members
under adverse conditions leads to unfavorable user attitudes
and perceptions of information systems and the information
services staff.

Proposition 4
   User involvement in the design and the operation of
information systems results in favorable user attitudes and
perceptions of information systems and the information ser-
vices staff.

Proposition 5

Systems with higher technical quality result in more favorable user attitudes and perceptions of information systems and the information services staff.

Proposition 6

High levels of management support for and participation in information systems activities result in favorable information services staff attitudes toward their jobs and users and favorable user attitudes and perceptions of information systems and the information services staff.

Use of an Information System

Proposition 7

Favorable user attitudes and perceptions of information systems and the information services staff lead to high levels of use of an information system.

Proposition 8

Individuals with differing decision styles have differing levels of use of information systems, perform different analyses of data, and take different actions based on information.

Proposition 9

Different personal and situational factors lead to differing levels of use of information systems and action.

Proposition 10

High levels of system use result from a system with high technical quality.

Proposition 11

High levels of use of an information system make it more likely that a user will take action based on the information provided.

Performance

Proposition 12

Individuals with differing decision styles have differing levels of performance.

Proposition 13

Different personal and situational factors lead to differing levels of performance.

Proposition 14

Low performance stimulates the use of problem finding information produced by information system.

Proposition 15

The use of problem-solving information produced by an information system leads to high levels of performance if the user takes action consistent with the information.

Proposition 16

For irrelevant information, low levels of use of an information system lead to high performance.

Varying support was found for all the propositions. The most important findings, however, were that,

The policies of the information services department and the technical quality of systems are associated with favorable user attitudes and perceptions. Favorable attitudes and perceptions and systems with high technical quality are associated with high levels of use of information systems. Finally, low performance is associated with high levels of use for problem-finding information while the use of problem solving information is positively associated with performance (pp. 105-106).

Lucas concludes that,

The model and findings stress the fact that information systems exist within the context of an organization. To design and operate successful information systems, three major groups in the organization must cooperate; management, users, and the information services department need to consider the organizational and technical variables we have discussed. Information systems have a tremendous potential for users and for the organization (p. 116).

Reasons for MIS Failures

The literature on MIS reveals numerous reasons why systems fail or have difficulties. Murdick and Ross (1975) have identified five major difficulties:

(1) Emphasis on the computer for clerical processing rather than for managerial decision making (2) Improper definition of system objectives and information requirements (3) Organization of the systems function (4) Disregarding the impact of the computer on human nature (5) Underestimating MIS complexity and costs (p. 549).

Voich, Mattice anu Shrode (1975) identified five criticisms of information systems which are providing useless information, providing excessive information, providing untimely information, excessive processing costs and disruption of the organization (p. 24).

Within nonprofit organizations, Herzlinger (1977) has identified the following reasons for failures of data systems: (1) The method of financing, (2) the characteristics and attitudes of top management, and (3) the executives of nonprofit organizations lack quantitative skills and instead rely on qualitative skills (pp. 81-86).

Diran (1977) studied an MIS in a college which "failed" because it was abandoned by the institution. He studied the human problems of acceptance of the MIS and found that vendors who sell the systems and the technicians who design them do not deal with this issue. In the literature he found little about the problems of human acceptance as did this researcher.

The purpose of Diran's study was to "search for a 'theory' which would explain and predict behavior as it pertained to the human acceptance of management information systems in colleges and universities" (p. 45). He theorized that,

> The level of human acceptance of management information systems in colleges and universities is related to the level of expectations held for that system, the methodology of implementation, and the degree of commitment (perceived self-interest) of the constituencies involved. The level of human acceptance is a function of these properties and is related to the perceived degree of success or failure of the system (p. 132).

Diran used an interview method in his research with emphasis placed on qualitative rather than quantitative data. The data evolved into the following categories which affected human acceptance of MIS: Level of Expectation, Methodology of Implementation, and Commitment and Self-Interest (p. 67).

Diran found that those directly responsible for the system had very high levels of expectation. The system never remotely attained these expectations. This overselling had a profound effect on the attitudes of administrators, faculty, and students toward the system. Each failure of the system decreased satisfaction which brought about decreased cooperation and commitment (p. 73). Additionally, estimates of time needed to implement the system were grossly underestimated as well as were the amount of staff involvement, requiring additional staff expertise and resources (p. 75).

Diran found that the system was imposed upon the users. Constituents or potential users were not consulted concerning requirements or specifications for the system. "This lack of consultation is perhaps the primus inter pares of the four major causes for the current disaffection with DPS . . ." (p. 77). The complex system was also implemented in its entirety rather than stages which had a negative effect upon acceptance. The lack of symbolic, professional and staff leadership had a deleterious effect on the attitudes of the constituencies (pp. 77-83).

The justification, pay-off, value, cost-effectiveness, or rationale for the system was unclear to the respondents, and their

perceptions of it did not warrant the allocation of resources. This perceived lack of usefulness for the system negatively affected the attitudes of the constituencies. Interestingly, the actions of the consultants added to the dissatisfaction to the users with the system (pp. 88-90).

Commitment and Self-Interest relates to self-interest and hence commitment of the various constituencies to the system (p. 1).

The president and his staff were the only group which identified with the system, but were naive in terms of capacities, resources and expertise required for systems development; were "Unapproachable on the topic;" were confused as to whether the system was designed as primarily a planning system or an operational system; and the constituencies did not perceive the same purpose of the system as the president and his staff (p. 99).

Perhaps the most significant group in the study was the faculty. They felt the system was "an attempt to erode faculty powers and perogatives and/or increase the relative power of the office of the president" (pp. 108-109). Some faculty felt the real purposes for the data were never revealed, while some felt the data was for deans which would enhance their power and that of the office of the president. Significantly, every faculty member felt the data were not neutral but could be a weapon to be used against them (pp. 104-109).

Faculty requirements were ignored in the design of the system. Faculty members exhibited a fear of machines which was most pervasive

among the humanists and somewhat less with the science faculty. This was compounded by a fear of computers. There was also fear that chairmen would be reduced to the level of employees via machine generated parameters for decision making; and that faculty jobs would be disrupted. A small minority feared that data would show they were doing less than their share and felt their pride was hurt in not being consulted, as they felt they were central to the college. All of this negatively affected system acceptance (pp. 110-112).

The cost of the system was considered to be a waste of money by the faculty. It was also perceived as a dehumanizing influence on campus. ". . . entirely too much importance was attached both to the system and to scientific management techniques. The system was considered to dehumanize relationships between people" (p. 115). These two factors had a negative effect on faculty acceptance of the system (pp. 113-115).

Attitudes of the faculty were also affected by their concern for privacy. Questions were raised expressing serious concern as to the possible uses of the data. Also, they were not confident in the security or integrity of the computerized data files. This, coupled with a fear of computers, proved deadly. The concern for privacy of data resulted in widespread noncompliance with requests for data and had a negative effect on faculty perceptions of the system (pp. 115-116). Faculty attitudes toward the system were hostile and directed at a variety of sources such as the director of the system, the president, and systems themselves. This hostility

did constitute a significant factor in determining faculty attitudes toward the system (pp. 117-119).

Diran's most important findings include:

1. Implementing the management information system fundamentally altered power relationships or organizational behavior in Metro College.

2. Assuming that the obvious benefits of the system would produce widespread support of it, which did not occur.

3. The setting of unrealistic expectations in terms of time and capabilities.

4. The president's office preordained the system to failure by setting too high a level of expectation for the system.

5. It is inadvisable to have a system perceived as "imposed" upon a college. This was one of the major sources of disaffection with the system.

6. The lack of input by various constituencies led to lack of identification with and alienation from the system.

7. Design and implement the system from "bottom to top" of the organizational structure, not "top to bottom." In the academic setting a system cannot be mandated by the office of the president without prior commitment by the faculty.

8. Implement a management information system in small stages. This keeps problems localized and at a manageable size.

9. It is important to have available an individual with systems experience.

10. If a system is perceived as operating in the interest of the various constituencies it's chances for acceptance are increased. There must be some generally accepted benefits otherwise problems with resource allocation will arise. Benefits produce support, but if the system is seen operating contrary to the interests of a group it will be opposed by this group.

Sanders (1974, p. 14) indicates that valued management information is accurate, timely, complete, concise and relevant. Cohn (1971, pp. 13-16) adds economy and flexibility and Kelly (1970, p. 314) adds reliability, security, capacity, quality, acceptance, and efficiency.

Cooperative Extension Service
Management Information System

The Cooperative Extension Service Management Information System was developed by the System Development Corporation (SDC) based on a request by the Extension Service. The cooperative nature of Extension was a determinant in setting the direction for its development. Thus, four foci were identified in developing EMIS/ SEMIS which were to aid CES management in areas including:

1. Development of short- and long-range plans, National goals, state targets, and local needs.
2. Determination of alternatives in resource organization and allocation.
3. Determination of progress in achieving stated purposes and objectives at all CES levels.
4. Determination of resource expenditures associated with specific purposes and objectives (Rosenberg et al., 1967, p. 1).

In the design and implementation of the system the following economic and noneconomic parameters were considered as critical constraints (Rosenberg, et al., pp. 8-9).

1. The time needed by professional staff to gather and transmit data. Time is the single most important resource of staff.

2. Beyond professional time the other costs associated with the system, i.e., clerical time, equipment and related expenses must be considered.

3. The data must have utility at the initial gathering level and at other management levels.

4. CES must develop and implement an ongoing internal educational program to accompany the management information system.

5. The management information system must be sufficiently flexible to accept different interpretations by states of the scope and spectrum of CES educational activities.

6. The management information system must be designed to obtain data despite language differences due to environment, custom, policy, regionality, discipline and other socio-economic factors.

7. At all levels the time intervals needed for reporting should be spread over a longer time period to minimize the time needed for reporting functions in a given day or week.

SDC identified the following CES needs (Rosenberg et al., 1967, pp. 10-11):

1. Reduce the time gap between recognition of a problem and the implementation of plans to solve the problem.

2. Develop a closer linkage between planning and activity reporting.

3. Improve the feedback of information on reports, particularly for county directors.

4. A need for more management training, particularly for county directors.

5. A need to insure retention of the identity of the contribution by CES in its educational efforts.

6. The MIS must be able to convert its planning and reporting information to the USDA budgeting process.

7. The MIS must be flexible to meet the needs of individual states yet provide a general framework within which data requirements common to all states and intra-state Extension levels can be collected.

SDC in recommending an MIS for the Cooperative Extension Service states (Rosenberg et al., 1967, p. 13):

a. Essential to a system capable of meeting such diverse
   needs are the ability to provide accurate and meaning-
   ful data for the management and direction functions at
   each Extension organization level (County, Areas, State,
   Federal) and the flexibility to continue to provide such
   accurate and meaningful data in the changing Extension
   environment.

b. The types of data the system must provide includes that
   concerning what is planned to be done by Extension;
   what has been accomplished in relation to those plans;
   how much professional effort was expended in carrying
   out those plans.

SEMIS Version III (EMIS, 1975) which is being studied in

this research, consisted of five distinct components: the Plan of

Work extract, the Activity Data, Accomplishment of Objectives, SEMIS

Personnel Subsystem, and Optional Field Subsystem. The first three

components are derived from the program development process above.

"All components are interdependent, mutually supportive and must be

related to one another in data utilization. No one component or data

element stands alone" (sec. 1-4).

The data that each SEMIS can process can provide information

which is used to (sec. 1-4):

- Mirror the State program development processes.
- Provide input into the planning and implementation
  processes.
- Facilitate program priority determination.
- Allocate and secure resources.
- Monitor programs.
- Analyze programs and plans of work.
- Facilitate communication (internally and externally).
- Establish compatible State and national data bases.
- Establish State and national trends
- Reduce the necessity for special reports.
- Provide administration a basis for decision-making related
  to priorities, resource allocations and resource management.
- Provide each Extension worker and program unit a systematic
  way to categorize planned and expanded effort.
- Aid in interpretation of evaluation of effectiveness,
  impact, and efficiency of Extension's expended efforts.

It is necessary to note that one state's SEMIS elements may vary slightly from that of another state and from that of the national EMIS. To use state data nationally, it is necessary to convert it into the national EMIS elements.

Summary

The review of the literature on Management Information Systems yielded the following major generalizations:

1. Management Information Systems are a tool to assist managers in making, carrying out, and controlling decisions by providing selected data to the managers when needed.

2. As MIS can be assessed from the three perspectives of technical, economic and operational feasibility. Measuring user satisfaction is one way to assess operational feasibility.

3. Studies of user satisfaction have shown that it is related to job satisfaction, age, longevity, perceived management support of the MIS, degree of involvement in system design, output (printouts) quality.

4. The human and organization factors which contribute to management information systems failure can be categorized as follows:

Human factors include:

- Possible lack of quantitative skills by executives
- Lack of commitment by the users
- System perceived not operating in the interests of the users
- Too high expectations held for the system
- Characteristics and attitudes of top management

Organizational factors include:

- Methods of financing
- Incorrect methodology of implementation
- Alteration of power relationships or organizational behavior
- Improper definition of system objectives and information requirements

- Use of the MIS for clerical work rather than decision making
- Not understanding MIS complexity and cost
- Organization of the system function
- The MIS provides useless, excessive and untimely information

5. Criteria to evaluate systems include relevance, timeliness, economy, accuracy, flexibility, security, reliability, capacity, acceptance, efficiency, completeness, conciseness and quality.

6. The Cooperative Extension Service Management Information System was developed to assist CES staff at county, state, and national levels in planning programs, managing resources, evaluating programs on plans and determining costs associated with plans.

CHAPTER III

METHODOLOGY

This chapter describes the research design, population, instrument, collection of data, coding and tabulation of data, research hypotheses, dependent variables, independent variables, and analysis. The purpose of this study was to determine the relationship of selected human and organizational factors on user satisfaction of a State Extension Management Information System.

Population

The population for this study included all full- and part-time professional CES employees in Sample state. This represented a total of 138 staff. Permission was received from Sample state to send the research questionnaire to its staff who were encouraged to cooperate by completing and returning the questionnaire.

Instrument

The instrument used in this study was the mailed questionnaire (Appendix A). The mailed questionnaire approach had the following advantages (Setting, 1967):

1. Standardized wording order of questions, and instructions for recording responses insured uniformity from one measurement situation to another.

2. As no signature or clear identification was required, it provided the opportunity for more candid and open replies.

3. Less pressure was placed on the subject for immediate response so that he could ponder a difficult question before answering (p. 238).

In addition, Good (1941) states that "questionnaire inquiries are adapted both to gathering facts and to gathering opinions and attitudes and have a wide range of applications" (p. 325).

The questionnaire was constructed using the format of the questionnaire used by Ahern et al. (1977) in their user satisfaction study. Twenty-six of their questions are taken directly or modified slightly to fit this study. The other 45 questions on the research instrument were developed on the basis of the literature review. Table 3 identifies the source of the questions. Staff of the Institute of Social Research, University of Alaska, Fairbanks, were consulted for advice on the design of the questions.

The instrument was pretested by sending it to the twenty-eight professional faculty of the Cooperative Extension Service of the University of Alaska. As a result of the pretest, five questions were reworded, two categories on one question were renamed, and the expected time needed to complete the questionnaire was reduced from 30 to 20 minutes in the instructions. In addition, the response scale was randomly reversed on questions 1 through 65 to reduce any mind-set bias that could occur by having the negative or low score response be always number one on the left of the scale and the positive or high score response be always number seven on

TABLE 3.--Variable/Questionnaire Explanation.

Variable Name	Question	Source	Logical Analysis Placement Criteria	Variable Type
<u>Overall Satisfaction</u>	1	1*	Originally these questions are from Jenkins study. Ahern et al. used them in their study and found that question 1 which attempts to measure overall satisfaction directly is a good single indicator of user satisfaction.	Dependent #1 (only Question 1)
<u>System Design</u>				
Output Quality				Dependent #2
-general quality	2	1*		(Questions 1-12)
-accuracy	3	1*		
-amount of information	4	1*		
-type of information	5	1*		
-understandability	6	1*		
-format	7	1*		
-timeliness	8	1*		
-relevancy	9	1*		
-usefulness	10-12	1*		
-flexibility	21-22	1*	Relates to outputs of the system for users--printouts. It focuses on design of the system to "handle" and display data and the functional aspects of the printouts.	Independent Group 2
-suitability	19	1*		
-compatibility	23	1*		
-confidence	24	1*		
-amount of work I do	53	1*		
-information output change	54	1*		
-difficulty to interpret printouts	20	1*		

TABLE 3.--Continued.

Variable Name	Question	Source	Logical Analysis Placement Criteria	Variable Type
Input Quality				
-accuracy	13	2**	Relates to the input of data into the SEMIS system by users via the activity report.	Independent Group 1
-amount of information	14	2**		
-type of information	15	3**		
-ease of entry	16	2**		
-ease of error correction	17	2**		
-amount of time needed	18	3**		
Training and Ongoing User Assistance				
SEMIS staff helpful	25	1*	Involves training, knowledge, assistance of SEMIS staff and the utility of the SEMIS handbook	Independent Group 3
Impression of SEMIS staff	26	2**		
SEMIS staff work effectively	27	3**		
Handbook/specific questions	28	1*		
Place to go when have trouble	29	1*		
Effective training program	32	1*		
Handbook instructions helpful	33	1*		
Amount of training	34	1*		
Knowledge of special codes	35	1*		
Cost	36	3**	Perceived worth of system by users.	Independent Group 4
Management Attitudes				
SEMIS Staff care	30	3**	Perceived support of SEMIS by management-administrators, supervisors, and SEMIS staff.	Independent Group 5
SEMIS staff receptive	31	3**		
Administration	37-38	3,4**		
District supervisor	39-40	3,4**		

TABLE 3.--Continued.

Variable Name	Question	Source	Logical Analysis Placement Criteria	Variable Type
Employee Relationships				
Relationship between me and my supervisor	41	3**	Involves relationship between user and supervisor, co-workers, director, and perception of SEMIS data.	Independent Group 6
Relationship between me and my co-worker	42	3**		
SEMIS data strengthens influence of my supervisor	48	3**		
SEMIS data strengthens influence of director	49	3**		
SEMIS data strengthens my influence	50	3**		
SEMIS data is impersonal	51	3**		
SEMIS data brought more control of my job	52	3**		
Number of other office workers	71	3**	Not subjected to logical analysis because question calls for nominal data.	Question 71 Independent tested via Multivariate Analysis of Variance
System Security/Computer Compatibility				
Right people using SEMIS data	44	3**	Security of data and whether used by only those who ought to have it. Acceptance or comfort with computer per se.	Independent Group 7
Data security	45	3**		
Comfort with computer	47	3**		

TABLE 3.--Continued.

Variable Name	Ques-tion	Source	Logical Analysis Placement Criteria	Variable Type
Decision Making/Organizational Purpose				
SEMIS data used properly	43	3**	Use of SEMIS data in decision making	Independent Group 8
SEMIS data is used against me	46	3**		
Others base decisions excluding SEMIS	55	1*		
I base decisions excluding SEMIS	56	1*	Organizational purpose supported by SEMIS	
Organizational (CES) purpose	57	3**		
System (SEMIS) Purpose				
Develop annual plans	58	**	These questions are a result of restructuring the four design purposes of SEMIS	Independent Group 9
Develop long range plans	59	**		
Determine progress on annual plans	60	**		
Determine progress on long-range plans	61	**		
Determine alternatives in resource organization	62	**		
Determine alternatives in resource allocation	63	**		
Determine resource expenditures with specific plans	64	**		
Determine resource expenditures with specific objectives	65	**		

TABLE 3.--Continued.

Variable Name	Question	Source	Logical Analysis Placement Criteria	Variable Type
Demographic				
Position	66	2**	Not subjected to logical analysis. All demographic "data" were treated by the same statistical procedure to provide uniformity of analysis.	Independent tested via Multivariate Analysis of Variance
Office chairman	66	2**		
Number years employed	67	2**		
Age	68	1,2*		
Degree	69	2**		
Area of degree	70	3**		

SOURCES: 1 = Ahren et al. (1977)

2 = Lucas (1975)

3 = Diran (1977)

4 = Sartore (1976)

* = Questions taken directly or modified slightly from author indicated to fit this study.

** = This researcher's design of question.

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the right side of the scale. Four Alaska CES faculty who had com-
pleted the original questionnaire were asked to complete the revised
questionnaire. They all responded favorably to the revisions.

Except for the demographic questions, a seven-point graphical
scale is used to answer the questions. Jenkins (1977) used a seven-
point scale, Ahern et al. (1977) followed the same route while
Seward (1973, p. 140) recommended using a seven-point scale as a
result of his research. Nunnally (1978, p. 595) points out that
using more rather than fewer steps is advantageous with the degree
of discrimination increasing up to at least twenty steps, however,
the increase in reliability tends to level off at about seven steps
with little gain after the eleventh step. Also, according to Ahern
et al. (1977, p. 10) and Seward (1973, p. 140) a seven-point scale
as compared to a five-point scale helps reduce the tendency of
respondents to avoid extreme scores. Only two questions (4 and 14)
have the center of the scale as the maximum point of satisfaction;
all others have the extreme right (7 or 1) as the maximum point of
satisfaction.

Collection of Data

The questionnaire was sent to all full- and part-time pro-
fessional Cooperative Extension Service faculty in Sample state
(138). A cover letter was enclosed describing the rationale for the
study (see Appendix B). The cover of the questionnaire contained
the instructions for completion and return. Each questionnaire was

numbered for control purposes. A stamped, self-addressed return envelope was provided.

Approximately one week prior to mailing the questionnaire the SEMIS coordinator in Sample state sent a letter to its faculty informing them about the questionnaire they would be receiving and that the research had been approved by their state director and federal personnel. The letter encouraged all faculty to cooperate by completing the questionnaire.

A total of 85 faculty or 61.2 percent returned the completed questionnaire by the requested return date. A follow-up letter (Appendix C) was sent to all Sample state faculty which brought in 27 more questionnaires, raising the return rate to 81.2 percent.

The final effort to collect data involved sending a duplicate questionnaire with a second cover letter (Appendix D) to those who had not returned the questionnaire. This produced 20 more returns raising the final return level to 95.0 percent for a total of 132 out of 138 sampled. These 132 completed questionnaires composed the research sample.

Coding and Tabulation of Data

Responses to the collection instrument were coded on data coding forms used by the Computer Center at the University of Alaska, Fairbanks. The data was entered and verified by this researcher. Technical assistance was received from the Institute of Social Research and the Computer Center at the University of Alaska, Fairbanks. The data cards were subsequently brought to the computer

center at Michigan State University where statistical analyses were completed.

The reason for using two different computer centers was that the researcher is an employee of the University of Alaska and did the coding, tabulation, and frequency analysis at its Computer Center. Statistical testing of the hypothesis was done at the Michigan State University Computer Center where completion of this research occurred.

Hypotheses

The general hypothesis for this research was as follows:

> There will be a relationship between user satisfaction score and selected human and organizational factors in Sample state.

The research hypotheses tested are as follows:

Hypothesis 1:

> Overall satisfaction score and score on Milton Jenkins user satisfaction questions can be predicted from system design output quality, system design input quality, training and ongoing user assistance, cost, management attitudes, employee relationships, system security/computer compatibility, decision making/organizational (CES) purpose and systems (SEMIS) purpose.

Hypothesis 2:

> There is a difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions depending on user's position, years of employment, age, degree, area of degree, and number of extension employees in one's office.

Dependent Variable

User satisfaction in this research is a general term for describing how well the users feel the system meets their needs (Ahern et al., 1977).

The Variable/Questionnaire Explanation table identifies two dependent variables. Dependent variable number one is question number one on the research instrument. Dependent variable number two comprises questions 1-12 on the research instrument. Both measure user satisfaction. All twelve questions are from Jenkins' (1977) study and were also used by Ahern et al. (1977) in their study. Eight of Jenkins' questions were not used because they did not apply to the SEMIS system. Jenkins' first question, question 1 in this research, attempts to measure overall satisfaction directly, and according to Ahern et al. (1977), "it may be as good as the complete Jenkins series for this purpose" (p. 14).

Independent Variables

The literature review enabled 57 independent variables to be identified for use in this study. They are identified in Table 3 and organized into nine groups. The nine groups are categorized into human and organizational factors in Table 4.

Human factors or variables are those which are based initially in the individual user. That is, the user provides the factor or in the case of cost, for example, the researcher's interest is the attitude of the user toward the cost, not the cost per se. Employee relationships are the relationships between

TABLE 4.--Independent Variables.

Variable Group	Number Human Factors	Number Organizational Factors
System Design		
- Output Quality		7
- Input Quality		6
Training and Ongoing User Assistance		9
Attitude Toward Cost	1	
Management Attitudes		4
Employee Relationships	8	
System Security/Computer Compatibility		3
Decision Making/Organizational Purpose		5
Systems (SEMIS) Purpose		8
Demographic	6	—
TOTAL	15	42

selected people within the organization as a result of using the SEMIS system.

Organizational factors are those variables which initially are based in the organization. System design variables are factors provided through the SEMIS system by the organization. The organization is the source of the training and ongoing user assistance, the managers and their attitudes, the security of the data, the computer capability for the system, the organization's purpose, the purpose for decision making and the SEMIS system with its inherent purposes.
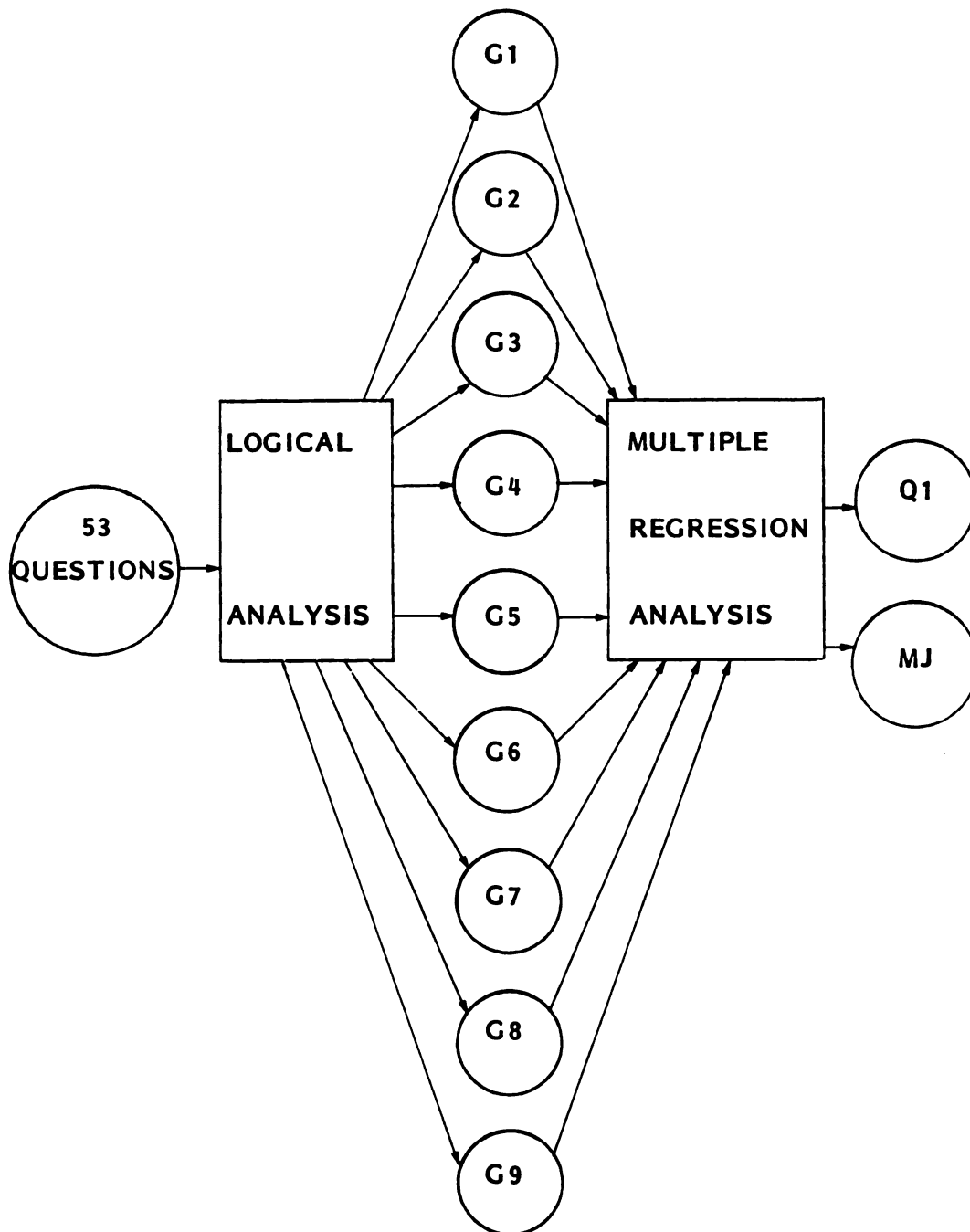
Analysis

Since this study involves many variables it is necessary to combine them into groups in order to deal with them, which involved examining relationships between the variables.

Statistically, correlation methodology permits measuring a number of variables and their interrelationships simultaneously. It also provides information about the degree of relationship of the variables studied. This knowledge of the degree of relationship provides deeper insight into the relationships studied and can lead to exploring possible causal factors (Borg, 1971, pp. 319-320).

Logical analysis is a data-reduction technique. The technique is operationalized by using logic in combining two or more variables into a group that is related. The relationship strength is checked via correlation coefficients to varify placement into a group. The resultant groups are a smaller set of factors or variables which permits the researcher to deal with a smaller number of variables.

The model in Figure 4 depicts the statistical procedure used to test the first hypothesis which requires the following steps:

1. Perform a logical analysis on the 53 user satisfaction questions (questions 13-65). The logical analysis procedure involves combining two or more questions into groups based on logical criteria. A single question may constitute its own group if it cannot be logically combined with one or more questions. The researcher generated the logical criteria which are identified

FIGURE 4.--Multiple Regression Analysis for Testing Hypothesis 1.

Key: Q1 - Question 1 on the research questionnaire
      MJ - Questions 1-12 on the research questionnaire
            (Jenkins' [1977] user satisfaction questions)
   G1 - G9 - Nine logical groups (see Table 3).

in Table 3. To verify whether a question should be placed into a group, the correlation coefficient was checked (a correlation matrix of the user satisfaction questions was generated). The result of the logical analysis was the identification of nine groups which are shown in Table 3.

2. Perform a multiple regression analysis on the nine groups relative to the dependent variables Q1 and MJ.

> The basic goal of multiple regression is to produce a linear combination of independent variables which will correlate as highly as possible with the dependent variable. This linear combination can be used to "predict" values of the dependent variable, and the importance of each of the independent variables in that prediction can be assessed (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975, pp. 8-9).

The model in Figure 5 depicts the statistical procedure used to test the second hypothesis. Because three of the five demographic questions and question 71 produced data of a nominal level, analysis of variance was chosen as the statistical technique. When significant differences were identified via MANOVA, those variables with significant differences were tested via Scheffé post hoc tests.

> Analysis of variance is a statistical technique that assesses the effects of one or more categorical independent variable (factors) measured at any level upon a continuous dependent variable that is usually assumed to be measured at an interval level (Nie et al., 1975, p. 9).

Differences Between This Study and Other User Satisfaction Studies

The differences between this study and other studies of user satisfaction based on the above variable classification are as follows:
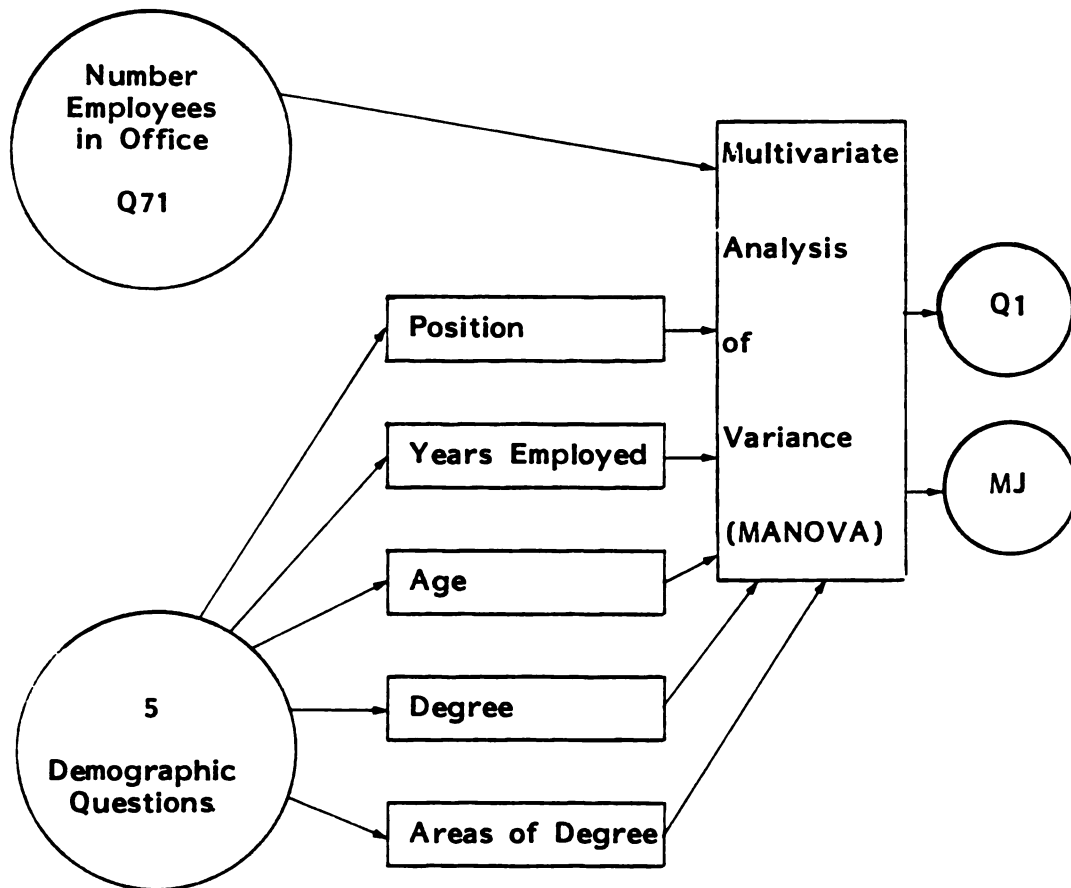
FIGURE 5.--Multivariate Analysis of Variance for Testing Hypothesis 2.

Key: Q1 – Question 1 on the research questionnaire.

       MJ – Questions 1-12 on the research questionnaire (Jenkins [1977] user satisfaction questions).

1. Ahern et al. (1977) included variables about overall satisfaction, system design, training and ongoing user assistance, systems use, and demographic variables but emphasis was on the first three. This study includes all these variables. Ahern et al. (1977) also included variables on job satisfaction and organizational climate which this study excludes.

2. Lucas' (1975) research included variables used by Ahern et al. (1977). This research uses Lucas' input quality system design variables, demographic variables and one training and ongoing user assistance variable. However, this research expands upon these variables.

3. Seward's (1973) study focused on the quality of outputs of the system as a surrogate for overall system effectiveness. He dealt only with four output quality variables. Those variables are part of this study.

4. Diran (1977) identified many human and organizational factors of which 25 are included in this research. None of these were included in the above user satisfaction studies.

5. This study focuses on an MIS that is classified as multi-user, that is, several organizations (states) use the same system. Other studies referenced were essentially on single user systems. Interestingly, Ahern et al. (1977) conjectured that "multi-user systems will generally be more troublesome and have lower (or at least a wider range of) user satisfaction scores than a single-user system" (p. 58). Guthrie (1971) found a significant difference among different organizations in his study.

6. The Metro College system was imposed by its administration and has failed (Diran, 1977). SEMIS was imposed by federal level extension administrators and continues to exist after nearly a decade. Interestingly, the county agents (field staff) consider themselves in essence to be the Cooperative Extension Service, just as the Metro College faculty consider themselves to be the "college," and in both cases neither were consulted in the development of the system. Yet SEMIS exists and the Metro College system was not continued. Therefore, we are studying a system that remains in operation. The Metro College system was studied after it failed.

Summary

User satisfaction was measured in this study with two dependent variables relative to 57 independent variables. In this chapter the composition of the dependent variables is detailed, and the logical grouping of the 57 independent variables into nine groups is explained. The two statistical methods to test the hypotheses were explained: Multiple Regression Analysis and Multivariate Analysis of Variance. Several differences between this user satisfaction study and other user satisfaction studies were identified.

CHAPTER IV

ANALYSIS OF THE DATA

Data gathered on user satisfaction of a state Extension
Management Information System in this study are analyzed in this
chapter.

Profile of Respondents

The research sample was all (138) full- and part-time CES
professionals from Sample state. The demographic questions revealed
the social characteristics of the respondents.

Table 5 shows the majority of respondents (52.3 percent) are
40 years old or under. The most frequent response was to the 51-55
age group followed by the 31-35 and 26-30 age groups with 20 each.
However, the degree of skewness of 0.068 indicates a relatively
evenly distributed group of respondents by age group.

The majority of respondents (88 or 67.7 percent) are
employed in a county-level position; 5 (3.8 percent) are in a
district level position; and 37 (28.5 percent) held state level
positions. Table 6 provides the frequency distribution of the
respondents by present employment position.

If respondents had a position other than what was identified
on the questionnaire, they were requested to write in their position

TABLE 5.--Classification of Respondents by Age.

Age Range in Years	Frequency	Percent	Cumulative Percent
25 or under	10	7.6	7.6
26-30	20	15.2	22.9
31-35	20	15.2	38.2
36-40	18	13.6	51.9
41-45	19	14.4	66.4
46-50	14	10.6	77.1
51-55	21	15.9	93.1
56-60	8	6.1	99.2
61-65	1	0.8	100.0
No Response	1	0.8	
TOTAL	132	100.0	

TABLE 6.--Classification of Respondents by Present Employment Positions.

Position	Frequency	Percent	Cumulative Percent
4-H Agent	17	12.9	13.1
Home Economics Agent	19	14.4	27.7
Agricultural Agent	17	12.9	40.8
Other County Agent	35	26.5	67.7
District Agricultural Agent	1	0.8	68.5
District Supervisor	4	3.0	71.5
State Administration	6	4.5	76.2
State 4-H Specialist	3	2.3	78.5
State Economics Specialist	6	4.5	83.1
State Agricultural Specialist	17	12.9	96.2
Development Specialist	3	2.3	98.5
State Communication Specialist	1	0.8	99.2
State Program Specialist	1	0.8	100.0
No Response	2	1.5	
TOTAL	132	100.0	

title. Only those at the county level responded and all of the 35 responses indicated multi-responsibility positions. That is, the positions carried more than one major program responsibility, i.e., 4-H/Agricultural Agent. The positions identified are listed in Table 7. Thirty-five county respondents identified themselves as county chairmen.

TABLE 7.--Classification of Respondents by Employment Positions for Other County Staff Positions.

Positions	Frequency	Percent	Cumulative Percent
4-H/Agricultural Agent	3	8.5	8.5
4-H/Home Economics Agent	12	34.2	42.7
4-H/Community Resource Development Agent	2	5.7	48.4
4-H/Home Economics/Community Resource Development Agent	2	5.7	54.1
4-H/Home Economics/Community Resource Development/ Agricultural Agent	8	22.8	76.9
Agricultural/Community Resource Development Agent	6	17.4	94.3
Home Economics/EFNEP* Agent	2	5.7	100.0
TOTAL	35	100.0	

*Expanded Food & Nutrition Education Program

The years of employment of the participants indicate that the majority (59.1 percent) have been employed ten or less years by the Cooperative Extension Service (Table 8). The most frequently checked category with 30 participants checking was six to ten years followed by 29 checking the zero to two years employment category and 19 checking the three to five year category.

TABLE 8.--Classification of Respondents by Total Years Employed by Cooperative Extension Service.

Total Years Employed	Frequency	Percent	Cumulative Percent
0- 2	29	22.0	22.0
3- 5	19	14.4	36.4
6-10	30	22.7	59.1
11-15	15	11.4	70.5
16-20	12	9.1	79.5
21-25	11	8.3	87.9
26-30	15	11.4	99.2
31-35	1	0.8	100.0
TOTAL	132	100.0	

One-half of the respondents had achieved the masters degree (Table 9). For the remaining half, 32.6 percent of the respondents held bachelors degrees and the doctorate degree was achieved by 17.4 percent of the respondents.

Respondents were also asked to identify the area of their academic degree. The agricultural science area (Table 10) was the

TABLE 9.--Classification of Respondents by Highest Academic Degree Achieved.

Degree	Frequency	Percent	Cumulative Percent
Bachelors	43	32.6	32.6
Masters	66	50.0	82.6
Doctorate	23	17.4	100.0
TOTAL	132	100.0	

TABLE 10.--Classification of Respondents by Area of Degree.

Area of Degree	Frequency	Percent	Cumulative Percent
Home Economics	41	31.1	31.1
Agricultural Sciences	51	38.6	69.7
Plant Sciences	6	4.5	74.2
Social Sciences	4	3.0	77.3
Education/Behavioral Science	16	12.1	89.4
Other	14	10.6	100.0
TOTAL	132	100.0	

most frequently identified degree area (51 or 38.6 percent) and Home Economics was the second most frequently identified degree area.

The 14 other areas of degree responses with less frequency are shown in Table 11.

TABLE 11.--Classification of Respondents by Area of Degree for
Other Areas of Degree.

Area of Degree	Frequency	Percent	Cumulative Percent
Natural Science	3	21.4	21.4
Home Economics/Education/ Behavioral Science	3	21.4	42.8
Agricultural Science/Education/ Behavioral Science	6	43.0	85.8
Business and Economics	1	2.1	92.9
Home Economics/Extension Administration	1	2.1	100.0
TOTAL	14	100.0	

Analysis of the Hypotheses

Hypothesis 1:

Overall satisfaction score and score on Milton
Jenkins user satisfaction questions can be predicted
from system design output quality, system design
input quality, training and ongoing user assistance,
cost, management attitudes, employee relationships,
system security/computer compatibility, decision
making/organizational purpose and system (SEMIS)
purpose.

In order to test the first hypothesis it was divided into
two sub-hypotheses separating the overall satisfaction score from
that of Milton Jenkins' user satisfaction score. The sub-
hypotheses are stated in the null form.

Hypothesis la:

There is no relationship between overall
satisfaction score and the following predictor
variables:

1. system design output quality
2. system design input quality
3. training and ongoing user assistance
4. cost
5. management attitudes
6. employee relationships
7. system security/computer compatibility
8. decision making/organizational purpose
9. system (SEMIS) purpose

Hypothesis lb:

There is no relationship between score on
Milton Jenkins user satisfaction questions
and the following predictor variables:

1. system design output quality
2. system design input quality
3. training and ongoing user assistance
4. cost
5. management attitudes
6. employee relationships
7. system security/computer compatibility
8. decision making/organizational purpose
9. system (SEMIS) purpose

These hypotheses were tested via Multiple Regression

Analysis. The level of significance was set at .05 for interpreting

statistical data. The predictor variables were entered into the

regression procedure on a predicted order of importance. That

order or strength of the variable in predicting user satisfaction

was based on the researcher's interpretation of the literature

review. The order, in decreasing order of importance, is as

follows:

1. Employee relationships
2. Management attitudes
3. Training and ongoing user assistance
4. System design output quality
5. System design input quality
6. System (SEMIS) purpose
7. Decision making/organizational purpose
8. System security/computer compatibility
9. Cost

The statistical test results for each of the two dependent variables will be considered and explained separately. The relationships between the dependent variable, overall satisfaction score and the nine independent (predictor) variables are summarized in Table 12. The overall satisfaction score can be predicted from employee relationships, management attitudes, training and ongoing user assistance, system design output quality and system design input quality. These five predictor variables accounted for 48.0 percent (R square) of the variance in the overall satisfaction score. However, given all the variables above it, management attitudes accounted for only 0.16 percent of the variance and system design output quality accounted for only 0.02 percent of the variance. Also, Beta weight scores indicate these two variables are negatively correlated with user satisfaction scores.

The remaining four predictor variables, system (SEMIS) purpose, decision making/organizational purpose, system security/ computer compatibility, and cost accounted for only 3.8 percent of the variance. However, given all the variables above it, decision making and organizational purpose accounted for 3.5 percent of the variance.

TABLE 12.--Multiple Regression Statistics for Overall Satisfaction
Score.

Variable	Beta Weight	Significance Level	R Square	R Square Change
Employee relationships	.900	.000	.35546	.35546
Management attitudes	-.036	.675	.35702	.00156
Training and ongoing user assistance	.037	.012	.41171	.05469
System design output quality	-.036	.890	.41187	.00016
System design input quality	.068	.003	.48034	.06847
System (SEMIS) purpose	-.016	.856	.48059	.00025
Decision making/ organizational purpose	.951	.030	.51571	.03512
System security/computer compatibility	.016	.702	.51678	.00107
Cost	.041	.672	.51810	.00132

For the second dependent variable, investigation of data in
Table 13 reveals that score on MJ user satisfaction questions can be
predicted from employee relationships, management attitudes, training
and ongoing user assistance, system design output quality and system
design input quality. These five predictor variables accounted for
58.7 percent (R square) of the variance in score on MJ user satisfac-
tion questions. However, given the variable above, management
attitudes accounted for only 2.6 percent of the variance and Beta
weight score indicates it is negatively correlated with user satis-
faction score. The remaining four predictor variables accounted for
only 2.8 percent of the variance.

TABLE 13.--Multiple Regression Statistics for Score on Milton
Jenkins User Satisfaction Questions.

Variable	Beta Weight	Significance Level	R Square	R Square Change
Employee relationships	.343	.000	.38327	.38327
Management attitudes	-.118	.078	.40914	.02587
Training and ongoing user assistance	.323	.004	.47582	.06568
System design output quality	.259	.001	.55565	.08082
System design input quality	.378	.023	.58740	.03176
System (SEMIS) purpose	.025	.279	.59439	.00699
Decision making/ organizational purpose	.282	.128	.60804	.01356
System security/computer compatibility	-.187	.717	.60881	.00077
Cost	.754	.307	.61500	.00619

The correlation coefficients (Table 14) between the predictor variables and overall satisfaction score and score on Milton Jenkins user satisfaction questions reveal:

1. All predictor variables are positively related to overall satisfaction.

2. All predictor variables are positively related to MJ user satisfaction questions.

TABLE 14.--Correlation Coefficients Between Predictor Variables
and Overall Satisfaction Score and Score on Milton
Jenkins Satisfaction Questions.

Variable	Overall Satisfaction	MJ User Satisfaction
Employee relationships	.596	.619
Management attitudes	.340	.456
Training and ongoing user assistance	.452	.528
System design output quality	.371	.638
System design input quality	.495	.579
System (SEMIS) purpose	.339	.525
Decision making/organizational purpose	.514	.587
System security/computer compatibility	.349	.407
Cost	.382	.539

3. Each predictor variable has a higher correlation coefficient for MJ user satisfaction questions than for overall satisfaction.

Hypothesis 2:

There is a difference in overall satisfaction score and Milton Jenkins user satisfaction questions depending on users position, years of employment, age, academic degree, area of degree and number of extension employees in his/her office.

In order to test this hypothesis it was divided into seven sub-hypotheses which are stated in the null form. They are stated below with statistical test results. A .05 level of significance was set for interpreting test scores.

Hypothesis 2a:

There is no difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions when compared by the following employment positions:

1. 4-H Agent
2. Home Economics Agent
3. Agricultural Agent
4. Other County Agent
5. Specialist
6. Administrator

Analysis of the data from Multivariate Analysis of Variance show that overall satisfaction score and score on MJ user satisfaction questions when taken together are significantly related to users employment position (see Table 15). Therefore, the hypothesis was rejected at the .05 level of significance.

Since there is a significant multivariate relationships for Hypothesis 2a, further examination revealed both overall satisfaction and MJ user satisfaction questions are significantly related to users' position (Univariate F-test: Overall satisfaction .015, MJ user satisfaction .002).

To determine more specifically where the significant relationships are, Scheffé post hoc tests were applied to the employee position groups. Based on the mean scores (Table 16) on the two

TABLE 15.--Multivariate Tests of Significance for Employment
Position.

Hypothesis	Test Name[*]		
	Pillais	Hotellings	Wilks
2a	.030	.022	.026
2b	.037	.040	.039
2c	.116	.117	.116
2d	.001	.006	.001
2e	.509	.770	.510
2f	.200	.208	.204
2g	.106	.106	.106

[*]Three common overall multivariate tests (Finn, 1974).

TABLE 16.--Means and Standard Deviations for Employment Position
Held.

Dependent Variable	Position	Mean	Standard Deviation
Overall Satisfaction	4-H Agent	3.933	1.223
	Home Economics Agent	4.235	1.147
	Agricultural Agent	4.059	1.298
	Other Agent	4.394	0.998
	Specialist	3.414	1.659
	Administration	5.000	1.491
Milton Jenkins User Satisfaction	4-H Agent	45.533	8.193
	Home Economics Agent	45.412	9.083
	Agricultural Agent	44.236	13.127
	Other Agent	48.091	8.815
	Specialist	34.414	14.034
	Administration	53.700	12.597

dependent variables, comparisons were made between the following groups of employees:

1. All county agents and specialists compared to administrators.

2. All county agents compared to administrators.

3. Specialists compared to administrators

4. All county agents compared to specialists.

For overall satisfaction these comparisons showed only one significant difference (.05 level) which was that administrators were more satisfied than specialists with SEMIS. But when comparing the groups with MJ user satisfaction questions a significant difference was found on all four of the above groups as follows:

1. Administrators were more satisfied than all county agents and specialists collectively.

2. Administrators were more satisfied than all county agents.

3. Administrators were more satisfied than specialists.

4. All county agents were more satisfied than specialists.

Hypothesis 2b:

There is no difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions when compared by the group with the following years of employment:

1. 0-2
2. 3-5
3. 6-10
4. 11-15
5. 16-20
6. 21-25
7. 26-30

Analysis of the data from Multivariate Analysis of Variance shows that overall satisfaction score and score on MJ user satisfaction questions when taken together are significantly related to users years of employment (see Table 14). Therefore, the hypothesis was rejected at the .05 level of significance.

Since there is a significant relationship for Hypothesis 2b, further examination revealed only MJ user satisfaction questions are significantly related to years of employment in the Cooperative Extension Service (Univariate F-test: MJ user satisfaction .042).

Examination of the cell means shows that users with 21-25 years of employment had the highest degree of user satisfaction with SEMIS. Users with 16-20 years of employment had the lowest degree of user satisfaction with SEMIS (see Table 17).

TABLE 17.--Means and Standard Deviations for Years of Employment with Cooperative Extension Service.

Dependent Variable	Years of Employment	Mean	Standard Deviation
Milton Jenkins User Satisfaction	0- 2	43.321	11.945
	3- 5	45.722	10.005
	6-10	43.346	9.024
	11-15	42.429	9.998
	16-20	41.600	12.668
	21-25	55.545	15.572
	26-30	48.733	13.139

To determine where the significant relationships are, Scheffé post hoc tests were applied to the years of employment groups. Based on the mean scores (Table 17) for MJ user satisfaction questions, comparisons were made between the following groups of employees:

0-20 years employed compared to 21-25 years employed:	T Prob. .001
0-20 years employed compared to 26-30 years employed:	T Prob. .094
3-5 years employed compared to 21-25 years employed:	T Prob. .027
21-25 years employed compared to 26-30 years employed:	T Prob. .138

These comparisons showed that user satisfaction score on MJ user satisfaction questions is strongly and positively related to employees with 21-25 years of employment with CES. The hypothesis is partially confirmed.

Hypothesis 2c:

There is no difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions when compared by the following employee age groups:

1. 25 and under
2. 26-30
3. 31-35
4. 36-40
5. 41-45
6. 46-50
7. 51-55
8. 56-60
9. 61-65

Analysis of the data taken from the Multivariate Analysis of Variance indicate that overall satisfaction score and score on Milton Jenkins user satisfaction questions are not significantly related to user's age. The hypothesis was not rejected at the .05 level (see Table 15).

Hypothesis 2d:

There is no difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions when compared by the following highest academic degree held:

1. bachelors degree
2. masters degree
3. doctorate degree

Analysis of the data taken from Multivariate Analysis of Variance indicate that overall satisfaction and score on Milton Jenkins user satisfaction questions when taken together are significantly related to users highest academic degree held (see Table 15). Therefore, the hypothesis was rejected at the .05 level of significance.

Since there is a significant relationship for Hypothesis 2d, further examinations revealed both overall satisfaction and MJ user satisfaction questions are significantly related to the highest academic degree held by users (Univariate F-test: Overall satisfaction .001, MJ user satisfaction .0005).

To determine where the significant relationships are, Scheffé post hoc tests were applied to the academic degree groups.

TABLE 18.--Means and Standard Deviations for Highest Academic
Degree Held.

Dependent Variable	Degree	Mean	Standard Deviation
Overall Satisfaction	Bachelors	4.293	1.146
	Masters	4.300	1.306
	Doctorate	3.137	1.490
Milton Jenkins User Satisfaction	Bachelors	45.780	9.893
	Masters	47.950	11.218
	Doctorate	36.773	13.107

Comparisons were made between the following groups by use of the mean scores (Table 18) on the two dependent variables:

1. Bachelors compared to Masters

2. Bachelors compared to Doctorate

3. Masters compared to Doctorate

The comparisons revealed the following significant differences (.05 level) for both dependent variables, overall satisfaction, and MJ user satisfaction:

1. Users holding bachelors degrees were more satisfied (.001 level) than users with doctorate degrees.

2. Users holding masters degrees were more satisfied (.0005 level) than users holding doctorate degrees.

The hypothesis was partially confirmed.

Hypothesis 2e:

There is no difference in overall satisfaction
score and score on Milton Jenkins user satisfac-
tion questions when compared by the following
areas of academic degree:

1. Home Economics
2. Agricultural Sciences
3. Social Sciences

Analysis of the data taken from Multivariate Analysis of

Variance shows that the overall satisfaction score and score on

Milton Jenkins user satisfaction questions are not significantly

related to user's area of academic degree. The hypothesis was not

rejected at the .05 level (see Table 15).

Hypothesis 2f:

There is no difference in overall satisfaction
score and score on Milton Jenkins user satisfac-
tion questions when compared by total number of
employees in user's office as follows:

1. 1
2. 2- 3
3. 4- 5
4. 6-10
5. 11-15
6. 16-20
7. 21 and above

Analysis of the data taken from Multivariate Analysis of

Variance shows that overall satisfaction score and score on Milton

Jenkins user satisfaction questions are not significantly related

to number of employees in user's office. The hypothesis was not

rejected at the .05 level (see Table 15).

Hypothesis 2g:

>There is no difference in overall satisfaction
>score and score on Milton Jenkins user satis-
>faction questions when comparing county chair-
>persons and nonchairpersons.

Analysis of the data taken from Multivariate Analysis of Variance shows that overall satisfaction score and score on Milton Jenkins user satisfaction questions are not significantly related to the position of county chairperson. The hypothesis was not rejected at the .05 level (see Table 15).

Discussion

In the Multiple Regression Analysis procedure the predictor variables were entered in a predicted rank order. Thus interpretation of the results is made on that same basis.

Employee relations was identified as the most important of the nine variable groups in predicting user satisfaction. The multiple regression analysis statistics show it is a strong predictor of user satisfaction. This is supported by a strong positive correlation coefficient (Table 14) for both dependent variables and the Beta weights (Tables 12 and 13) show there is a positive relationship with user satisfaction score.

Management attitudes was thought to be the second most important of the nine variable groups in predicting user satisfaction. The multiple regression analysis statistics, however, show it is a weak predictor of user satisfaction given that variance which employee relations has already taken into account. The correlation

coefficients indicate a strong positive relationship between these dependent variables, but the Beta weights indicate a negative correlation between management attitudes and user satisfaction. This means that after accounting for all the variance by employee relations, that which is left is negatively correlated with user satisfaction.

Training and ongoing user assistance was thought to be the third most important of the nine variable groups in predicting user satisfaction. The multiple regression statistics noted above show that it is a strong predictor of user satisfaction. The correlation coefficients are high (Table 14) and the Beta weights show it is positively related to user satisfaction. Thus after accounting for all the variance by the two preceding variables (employee relations and management attitudes) training and ongoing user assistance accounts for a significant portion of the variance and that it is positively related to user satisfaction score.

System design output quality was thought to be the fourth most important of the nine variable groups in predicting user satisfaction. The multiple regression statistics noted above show that it is a weak predictor of overall satisfaction score but a strong predictor of score on Milton Jenkins user satisfaction questions. The correlations coefficients show a higher correlation with the MJ user satisfaction questions than for overall satisfaction and the Beta weights show a positive correlation between user satisfaction and MJ user satisfaction questions but a negative correlation with overall satisfaction score. The positive correlation may be

explained by noting that the questions in this variable group and eleven of the MJ user satisfaction questions focus on the same thing--printouts.

System design input quality was thought to be fifth most important of the nine variable groups in predicting user satisfaction. The multiple regression statistics noted above show that it is a strong predictor of user satisfaction. The correlation coefficients are high for both dependent variables and the Beta weights indicate a positive correlation between user satisfaction and both dependent variables. Thus given the variance accounted for by the variables before it (employee relationships, management attitudes, training and ongoing user assistance and system design output quality) this variable, system design input quality, is a significant predictor of user satisfaction.

Summary

In Chapter IV the findings of the study were presented with interpretation. The statistical analysis showed that user satisfaction can be predicted by employee relationships, training and ongoing user assistance, system design input quality and to a lesser degree by management attitudes and system design output quality. The predictor variables system (SEMIS) purpose, decision making/ organizational purpose, system security/computer compatibility and cost failed to predict user satisfaction with SEMIS. Therefore, the first hypothesis was partially confirmed.

Hypothesis 2 tested the relationship between demographic variables and user satisfaction. Hypothesis 2a tested the relationship between user's employment position and user satisfaction with SEMIS. The results showed administrators were significantly more satisfied with SEMIS compared to county agents and specialists, and county agents were more satisfied with SEMIS than specialists.

Hypothesis 2b tested the relationship between user's years of employment with CES and user satisfaction with SEMIS. The results showed employees with 21-25 years of employment were significantly more satisfied than those with 0-20 years of employment but not with those over 26 years of employment.

Hypothesis 2c tested the relationship between users age and user satisfaction with SEMIS. No significant differences were found.

Hypothesis 2d tested the relationship between users highest academic degree held and user satisfaction. The results showed staff members holding bachelors or masters degree were significantly more satisfied with SEMIS than those holding doctorate degrees.

Hypothesis 2e tested the relationship between user's area of academic degree and user satisfaction with SEMIS. No significant differences were found.

Hypothesis 2f tested the relationship between total number of employees in user's office and user satisfaction. No significant differences were found.

Hypothesis 2g tested the relationship between county chairpersons and nonchairpersons and user satisfaction. No significant differences were found.

CHAPTER V

SUMMARY

In Chapter I the background for this study revealed that
the State Extension Management Information System was developed as
a management tool to help the Cooperative Extension Service demon-
strate accountability. The reaction to SEMIS by the users, CES
staff, has been negative. The purpose of this research was to study
the effect of selected human and organizational factors on user
satisfaction of SEMIS. If factors could be identified which were
contributing to dissatisfaction with SEMIS, then appropriate CES
management could make necessary decisions which might help improve
the level of user satisfaction of SEMIS and thereby help CES in
demonstrating accountability. The general hypothesis and limitations
of the study were stated in Chapter I with assumptions and definitions.

Relevant literature was reviewed in Chapter II. That review
found that measuring user satisfaction is one way to assess the
operational feasibility of a management information system. Studies
have shown user satisfaction is related to job satisfaction, age,
longevity, perceived management support of the MIS, degree of involve-
ment in system design, and output (printout) quality. Reasons con-
tributing to management information system failure include human
factors: (1) possible lack of quantitative skills by executives,

(2) lack of commitment by users, (3) too high expectations held for the system, and (4) certain characteristics and attitudes of top management; organizational factors: (1) method of financing, (2) incorrect methodology of implementation, (3) alteration of power relationships or organization behavior, (4) improper definition of system objectives and information requirements, (5) use of the MIS for clerical work rather than decision making, (6) not understanding MIS complexity and cost, (7) organization of the system function, and (8) the provision by MIS of useless, excessive, and untimely information.

Criteria to evaluate systems (mainly outputs) include relevance, timeliness, economy, accuracy, flexibility, security, reliability, capacity, acceptance, efficiency, completeness, conciseness and quality.

The Cooperative Extension Service Management Information System was developed to assist CES staff at county, state, and national levels in planning programs, managing resources, evaluating progress on plans, and determining costs associated with plans.

In Chapter III the methodology of the study was explained. User satisfaction was identified as the outcome or dependent variable and was measured by overall satisfaction score on question one and score on questions one through twelve of the research instrument.

Fifty-seven independent variables were identified from the literature review. These included five demographic data variables and one type of employee relationship variable which had to be treated statistically the same as demographic variables. The

remaining fifty-two independent variables were grouped on a logical basis into nine groups: employee relationships, management attitudes, training and ongoing user assistance, system design output quality, system design input quality, system (SEMIS) purpose, decision making and organizational purpose, system security/computer compatibility and cost.

A mailed questionnaire was sent to 138 full- and part-time professional CES employees of one state. The 132 completed questionnaires which were returned (95%) comprised the research sample.

Hypothesis 1:

> Overall satisfaction score and score on Milton Jenkins user satisfaction questions can be predicted from system design output quality, system design input quality, training and ongoing user assistance, cost, management attitudes, employee relationships, systems security/computer compatibility, decision making/organizational purpose, and system (SEMIS) purpose.

Hypothesis 2:

> There is a difference in overall satisfaction score and score on Milton Jenkins user satisfaction questions depending on users position, years of employment, age, academic degree, area of degree and number of extension employees in one's office.

Hypothesis 1 was tested via Multiple Regression Analysis and Hypothesis 2 was tested via Multivariate Analysis of Variance (MANOVA).

Chapter IV was devoted to presenting the analysis of data and results of statistical testing. Tests of the hypotheses yielded the following results at the .05 level of significance:

H1: User satisfaction can be predicted by employee relations, training and ongoing user assistance, system design input quality,

and to a lesser degree by management attitudes and system design output quality. The predictor variables system (SEMIS) purpose, decision making/organizational purpose, system security/computer compatibility and cost failed to predict user satisfaction with SEMIS. Therefore Hypothesis 1 was partially confirmed.

H2a: User satisfaction was significantly related to user's employment position. Specifically administrators were more satisfied with SEMIS compared to county agents and specialists, and county agents were more satisfied with SEMIS than specialists.

H2b: User satisfaction was significantly related to user's years of employment. Specifically employees who had 21-25 years of employment with CES were significantly more satisfied with SEMIS than those who had 0-20 years of employment.

H2c: The relationship between user satisfaction and user's age was found not to be significant.

H2d: User satisfaction was significantly related to highest academic degree. Specifically users holding bachelors or masters degree were significantly more satisfied than those holding a doctorate degree.

H2e: The relationship between user satisfaction and area of highest academic degree was found not to be significant.

H2f: The relationship between user satisfaction and total number of employees in users office was found not to be significant.

H2g: The relationship between user satisfaction and the position of office chairperson and nonchairperson was found not to be significant.

Conclusions

Based on this research it can be concluded that in Sample state the best predictors of user satisfaction of SEMIS are the following factors:

(1) employee relationships,

(2) training and ongoing user assistance, and

(3) system design input quality.

The demographic variables found to be significantly related to user satisfaction are:

(1) employee position,

(2) highest academic degree held, and

(3) years of employment with the Cooperative Extension Service.

Staff members who held bachelors or masters degrees were significantly more satisfied with SEMIS than those holding doctorate degrees. Staff members employed as county agents were more satisfied with SEMIS than Specialists, and administrators were more satisfied than county agents or specialists. Relative to years of employment with CES, staff members with 21-25 years of service are more satisfied with SEMIS than those with 0-20 years of employment.

Discussion

The multiple regression analysis used in this research is a statistical technique which permits analysis of the relationship between a dependent variable and one or more independent variables. It does not permit the inference of causality. Therefore, concluding that the conduct of three hours of training will yield an

increase in user satisfaction of SEMIS is not possible. The results of this technique indicate the strength of the predictor variables relative to the dependent variable and the relationship between the predictor variables. However, based on the strength of prediction it is logical to use the information from this research for developmental purposes. In so doing, recognition is made of the fact that causality has not been determined but rather that some results are predictable by taking appropriate action based on the research data, i.e., that conducting training on SEMIS should increase user satisfaction of SEMIS.

The questions that comprise the employee relations group were all based on Diran's (1977) study of a management information system which failed in a college. A theme which dominated the reasons for failure of that MIS was the employee relationships were affected by the MIS. This research shows employee relationships as a strong predictor of user satisfaction of SEMIS, thereby confirming the importance of this factor. As a result it appears that the Cooperative Extension Service in Sample state should recognize the importance of this factor and operate accordingly so that employee relationships will support and build user satisfaction of SEMIS. Based on this researcher's literature review the kind of questions comprising this logical group were used for the first time in a mailed questionnaire. The questions showed reliability and should be considered as important questions to use in future research.

The training and ongoing user assistance predictor variable group had questions primarily from the Ahern et al. study (1977).

In order to do any task an individual must have some kind of instruction. Thus, it is logical that this factor would be a strong predictor of user satisfaction with SEMIS. Therefore, it would appear that CES in Sample state should recognize the importance of this factor and employ an effective training and ongoing user assistance program.

System design input quality in this research essentially focuses on the activity reports or inputs which the users (CES staff) prepare for SEMIS. Input quality is partially dependent on the technical design of the system and once the system is in operation the input quality is dependent upon the user, CES staff. The staff help influence this quality by the care they exercise in identifying their work effort relative to design codes and the quantifying of that effort. Lucas (1975) and Diran (1977) both found input quality influenced user satisfaction. This research confirms that finding. Again, CES needs to recognize the importance of input quality and treat it in such a way that it will produce satisfaction with SEMIS from the users.

This research shows that administrators were more satisfied with SEMIS than county agents or specialists, thus it supports the findings of the Cooperative Extension Service in Minnesota (Keel, 1973). This research also showed that county agents were significantly more satisfied with SEMIS than specialists, which was not the case in Minnesota. Ahern et al. (1977) found employee position related to user satisfaction. This study supports that finding and appears related to the research by Sartore (1976) that administrative support for an MIS is strongly related to user satisfaction.

One implication of the finding, that specialists are less satisfied with SEMIS compared to other types of CES employees in Sample state, is that special effort needs to be directed toward this group in helping them become satisfied with SEMIS. A first step is to find out why they are less satisfied.

Only one category of years of employment was significantly related to user satisfaction. Since that category of 21-25 years of age contained only eleven employees or 8.3 percent of the research sample, it appears that other variables may be influencing it. That determination needs to be made. Ahern et al. (1977), however, did find longevity was related to user satisfaction. This research only partially bears out that finding.

In an academic setting the type of academic degree held had an influence on acceptance of the MIS in Metro College (Diran, 1977). CES is not academic in function. This research showed that in Sample state type of academic degree had no important influence on user satisfaction of SEMIS. However, the highest academic degree held was related to user satisfaction. Those staff members with doctorate degrees were found to be the least satisfied with SEMIS. One implication of this finding is that CES in Sample state needs to find out why staff members with doctorate degrees are less satisfied than those with bachelors or masters degrees and then direct appropriate special effort to overcome this lower level of satisfaction.

To the extent that State Extension Management Information Systems are similar in other states, these findings may have

application. Thus, the Cooperative Extension Services of those states may wish to be knowledgeable of this research as they provide leadership to the states relative to the State Extension Management Information System.

Implications for Future Research

This study focused on selected human and organizational factors and their relationship to user satisfaction of the State Extension Management Information System in Sample state. These factors or variables were selected primarily via the literature review on management information systems. The variables did however, include the purposes of SEMIS, but the justification document for SEMIS identified other factors which should be considered variables in future studies.

The demographic variables were tested relative to their relationship to user satisfaction. Another approach would be to determine the relationship between the demographic variables and the nine logical groups of variables.

Employees with 21-25 years of employment with CES represented the only group significantly related to user satisfaction of SEMIS. This relationship indicates a need for further study to determine what may be causing only this one group to be significantly related to user satisfaction.

Specialists when compared to other types of employees were found to be significantly less satisfied with SEMIS. This needs further study to determine what factors are causing dissatisfaction.

Staff members holding doctorate degrees are significantly less satisfied than those with bachelors or masters degrees. This needs further study to determine what factors are causing dissatisfaction for staff members holding doctorate degrees.

This study employed a data reduction technique which permitted combining 57 independent variables into nine groups. The research results therefore are based on these groups, not on each of the 57 independent variables. Further research should be done with the data by either Sample state or some other researcher, to more specifically determine what variables are affecting user satisfaction. This should at least include studying the variable groups which were found to be the strong predictors of user satisfaction.

The sample for this study was from one state in which SEMIS was operating smoothly. In order to draw conclusions for national implications to SEMIS, this study should be repeated in more states with various degrees of operating levels or a national study should be conducted with a research sample drawn from all states.

For national implications, research results based on group variables may be more useful than results based on each independent variable. At the state level, research results that are based on each independent variable may be the most useful.

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APPENDICES

APPENDIX A

RESEARCH QUESTIONNAIRE

SEMIS QUESTIONNAIRE

Dear Co-worker:

This questionnaire is designed to obtain your opinion of SEMIS (State Extension Management Information System). Please work through this questionnaire rapidly, without spending too much time on any one question. Ignore any question which clearly does not apply to your job. Preliminary tests indicate that most people can answer the questions in about twenty minutes. Your individual responses will not be revealed, except in statistical combination.

Thank you for your cooperation.

DIRECTIONS:

On the questions below, please circle the answer which best corresponds to your opinion. For example, if the question was:

HOW IS THE TEMPERATURE IN HERE TODAY?
Very cold   1   2   3   4   5   6   7   Very hot

Then if: you thought it was very cold, you should circle "one"
        you thought it was cold, you should circle "two"
        you thought it was cool, you should circle "three"
        you thought it was indifferent, you should circle "four"
        you thought it was warm, you should circle "five"
        you thought it was hot, you should circle "six"
        you thought it was very hot, you should circle "seven"

MAKE SURE YOU CHECK THE DIRECTION OF THE SCALE FOR EACH QUESTION!

1. MY OVERALL SATISFACTION WITH SEMIS IS BEST DESCRIBED AS:
   Very satisfied   1   2   3   4   5   6   7   Very dissatisfied

2. I THINK, IN GENERAL, THAT SEMIS PRINTOUTS ARE:
   Very satisfactory   1   2   3   4   5   6   7   Very unsatisfactory

I BELIEVE THAT THE CONTENTS OF THE SEMIS PRINTOUTS:

3. Are very inaccurate   1   2   3   4   5   6   7   Are very accurate

4. Contain too much information   1   2   3   4   5   6   7   Contain too little information

5. Contain the wrong type of information   1   2   3   4   5   6   7   Contain the right type of information

6. Are very difficult to understand   1   2   3   4   5   6   7   Are very easy to understand

I FEEL THAT SEMIS PRINTOUTS ARE:

7. Very poorly formatted   1   2   3   4   5   6   7   Excellently formatted

8. Very untimely   1   2   3   4   5   6   7   Very timely

9. Very relevant   1   2   3   4   5   6   7   Very irrelevant

HOW USEFUL DO YOU FIND THE REPORTS FROM THIS SYSTEM FOR:

10. IDENTIFYING AND DEFINING PROBLEMS:
    Very useful   1   2   3   4   5   6   7   Very useless

11. FORMULATING SOLUTIONS TO PROBLEMS:
    Very useful   1   2   3   4   5   6   7   Very useless

12. SELECTING AMONG ALTERNATIVE COURSES OF ACTION:
    Very useless   1   2   3   4   5   6   7   Very useful

I BELIEVE THE CONTENTS OF MY SEMIS WEEKLY ACTIVITY REPORTS:

13. Are very inaccurate   1 2 3 4 5 6 7   Are very accurate

14. Contain too little information about my efforts   1 2 3 4 5 6 7   Contain too much information about my efforts

15. Contain the wrong type of information about my efforts   1 2 3 4 5 6 7   Contain the right type of information about my efforts

16. I BELIEVE IT IS EASY TO COMPLETE THE SEMIS WEEKLY ACTIVITY REPORT.
Very strongly agree   1 2 3 4 5 6 7   Very strongly disagree

17. I BELIEVE IT IS EASY TO MAKE ERROR CORRECTIONS ON SEMIS.
Very strongly agree   1 2 3 4 5 6 7   Very strongly disagree

18. I BELIEVE IT TAKES A VERY SMALL AMOUNT OF TIME TO COMPLETE MY SEMIS WEEKLY ACTIVITY REPORT.
Very strongly agree   1 2 3 4 5 6 7   Very strongly disagree

19. THE PRINTOUTS I RECEIVE ARE WELL SUITED TO MY JOB LEVEL.
Very strongly disagree   1 2 3 4 5 6 7   Very strongly agree

20. IT IS DIFFICULT TO INTERPRET SEMIS PRINTOUTS.
Very strongly disagree   1 2 3 4 5 6 7   Very strongly agree

21. EACH CATEGORY OF DATA STORED IN SEMIS CAN BE COMBINED OR BROKEN DOWN IN ANY MANNER THAT I MIGHT REQUEST.
Very strongly disagree   1 2 3 4 5 6 7   Very strongly agree

22. SEMIS PROVIDES ENOUGH VARIETY OF INFORMATION TYPES TO MEET MY NEEDS.
Very strongly disagree   1 2 3 4 5 6 7   Very strongly agree

23. IF I HAVE TWO VERSIONS OF THE SAME REPORT, ONE TYPEWRITTEN AND THE OTHER ON A COMPUTER PRINTOUT, I FEEL MORE COMFORTABLE WITH THE TYPEWRITTEN REPORT.
Very strongly disagree   1 2 3 4 5 6 7   Very strongly agree

24. IF I HAVE TWO VERSIONS OF THE SAME REPORT, ONE TYPEWRITTEN AND THE OTHER ON A COMPUTER PRINTOUT, I HAVE MORE CONFIDENCE IN THE TYPEWRITTEN REPORT.

Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

25. SEMIS STAFF ARE VERY HELPFUL IN ASSISTING ME IN GETTING INFORMATION FROM THE SYSTEM.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

26. MY GENERAL IMPRESSION OF THE SEMIS STAFF IS THAT THEY ARE:

Highly competent technically   1   2   3   4   5   6   7   Not to competent technically

27. SEMIS STAFF WORK EFFECTIVELY WITH CES STAFF LIKE MYSELF.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

28. WHEN I HAVE SPECIFIC QUESTIONS ABOUT SEMIS, IT IS EASY FOR ME TO FIND WHAT I NEED TO KNOW FROM THE SEMIS HANDBOOK.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

29. THERE IS A SPECIFIC PLACE (OR PERSON) I CAN GO TO IF I HAVE TROUBLE WITH SEMIS.

Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

30. SEMIS STAFF CARE LITTLE ABOUT MY RESPONSIBILITIES.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

31. THE SEMIS STAFF ARE VERY RECEPTIVE TO PROPOSED CHANGES I SUGGEST FOR SEMIS.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

32. CES HAS AN EFFECTIVE TRAINING PROGRAM FOR SEMIS USAGE FOR PEOPLE LIKE MYSELF.

Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

33. THE SEMIS HANDBOOK INSTRUCTIONS WERE HELPFUL IN MY LEARNING HOW TO USE SEMIS AS PART OF MY JOB.

Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

34. I FEEL I HAVE RECEIVED AN ADEQUATE AMOUNT OF TRAINING ABOUT SEMIS.

Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

35. TO EFFECTIVELY USE SEMIS, ONE MUST HAVE EXTENSIVE KNOWLEDGE OF COMPLEX SPECIAL CODES.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

36. I FEEL SEMIS IS WORTH WHAT IT COSTS.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

37. I THINK OUR ACTING ASSOCIATE DIRECTOR IS SUPPORTIVE OF SEMIS.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

38. I THINK OUR DIRECTOR FEELS SEMIS IS A USEFUL SYSTEM.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

39. I THINK MY DISTRICT SUPERVISOR IS SUPPORTIVE OF SEMIS.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

40. I THINK MY DISTRICT SUPERVISOR FEELS SEMIS IS A USEFUL SYSTEM.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

41. I BELIEVE THE RELATIONSHIP BETWEEN ME AND MY DISTRICT SUPERVISOR HAS BEEN AFFECTED BY SEMIS:
In a negative manner   1   2   3   4   5   6   7   In a positive manner

42. I BELIEVE THE RELATIONSHIP BETWEEN ME AND MY OFFICE CO-WORKERS HAS BEEN AFFECTED BY SEMIS:
In a positive manner   1   2   3   4   5   6   7   In a negative manner

43. I FEEL CONFIDENT SEMIS DATA IS BEING USED PROPERLY.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

44. I FEEL CONFIDENT THAT THE RIGHT PEOPLE ARE USING SEMIS DATA.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

45. I FEEL SEMIS DATA IS AVAILABLE ONLY TO THOSE STAFF WHO SHOULD HAVE ACCESS TO IT.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

46. I BELIEVE SEMIS DATA IS BEING USED AGAINST ME.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

47. COMPUTERS MAKE A USEFUL CONTRIBUTION TO SOCIETY.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

48. SEMIS DATA STRENGTHENS THE INFLUENCE OF MY DISTRICT SUPERVISOR IN RELATION TO MY JOB.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

49. SEMIS DATA STRENGTHENS THE INFLUENCE OF THE ACTING ASSOCIATE DIRECTOR IN RELATION TO MY JOB.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

50. SEMIS DATA STRENGTHENS MY INFLUENCE IN RELATION TO MY JOB.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

51. SEMIS DATA IS IMPERSONAL.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

52. SEMIS BROUGHT INCREASED CONTROL OF MY JOB.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

53. SEMIS PRINTOUTS MAKE IT APPEAR THAT I DO LESS WORK THAN I ACTUALLY DO.
Very strongly disagree   1   2   3   4   5   6   7   Very strongly agree

54. SINCE YOU HAVE WORKED WITH CES, THE INFORMATION OUTPUT FROM SEMIS HAS:
Become much worse   1   2   3   4   5   6   7   Become much better

55. MOST OF THE PEOPLE I WORK WITH WOULD RATHER BASE THEIR DECISIONS ON PAST EXPERIENCE, INTUITION AND DATA/REPORTS OTHER THAN SEMIS, RATHER THAN INCLUDING SEMIS DATA.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

56. I WOULD RATHER BASE MY DECISIONS ON PAST EXPERIENCE, INTUITION AND DATA/REPORTS OTHER THAN SEMIS, RATHER THAN INCLUDING SEMIS DATA.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

57. SEMIS DOESN"T SERVE THE PURPOSE OF CES.
Very strongly agree   1   2   3   4   5   6   7   Very strongly disagree

HOW USEFUL DO YOU FIND SEMIS DATA AS A SOURCE OF INFORMATION IN:

58. THE DEVELOPMENT OF YOUR ANNUAL PLANS.

Very useless   1 2 3 4 5 6 7   Very useful

59. THE DEVELOPMENT OF YOUR LONG-RANGE PLANS (3-5 YEARS).

Very useless   1 2 3 4 5 6 7   Very useful

60. DETERMINING PROGRESS MADE ON YOUR ANNUAL PLANS.

Very useful   1 2 3 4 5 6 7   Very useless

61. DETERMINING PROGRESS MADE ON YOUR LONG-RANGE PLANDS (3-5 YEARS).

Very useless   1 2 3 4 5 6 7   Very useful

62. DETERMINING ALTERNATIVES IN RESOURCE ORGANIZATION.

Very useful   1 2 3 4 5 6 7   Very useless

63. DETERMINING ALTERNATIVES IN RESOURCE ALLOCATION.

Very useful   1 2 3 4 5 6 7   Very useless

64. DETERMINING RESOURCE EXPENDITURES ASSOCIATED WITH SPECIFIC PLANS.

Very useful   1 2 3 4 5 6 7   Very useless

65. DETERMINING RESOURCE EXPENDITURES ASSOCIATED WITH SPECIFIC OBJECTIVES.

Very useless   1 2 3 4 5 6 7   Very useful

BEFORE PROCEEDING ON, DID YOU HAVE ANY DIFFICULTY ANSWERING THE QUESTIONS BECAUSE THE SCALE VALUE WAS REVERSED ON A RANDOM BASIS FOR EACH QUESTION? IF SO, PLEASE GO BACK AND REVIEW YOUR RESPONSES BEFORE COMPLETING THE REST OF THE QUESTIONNAIRE.

66. WHAT IS YOUR PRESENT POSITION? (CHECK ONE)

County Staff	District or Regional Staff	State Staff
___ 4-H Agent	___ 4-H Staff	___ Administration
___ H. Ec. Agent	___ H. Ec. Staff	___ 4-H Specialist
___ Ag. Agent	___ Ag. Staff	___ H. Ec. Specialist
___ CRD Agent	___ CRD Staff	___ Ag. Specialist
___ Other Agent	___ Supervisor	___ CRD Specialist
_____ Please specify	___ Other	___ Communication Spec.
	_____ Please specify	___ Program Development
If Office chairman, please check here	_____	___ Staff Development
___		___ Other
		_____ Please specify
		_____

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67. TOTAL NUMBER OF YEARS EMPLOYED
BY COOPERATIVE EXTENSION
SERVICE (ROUND OFF TO NEAREST
YEAR). (CHECK ONE)

a. _____ 0 - 2

b. _____ 3 - 5

c. _____ 6 - 10

d. _____ 11 - 15

e. _____ 16 - 20

f. _____ 21 - 25

g. _____ 26 - 30

h. _____ 31 - 35

i. _____ 36 - 40

j. _____ 41 or over

68. WHAT IS YOUR AGE GROUP?

a. _____ 25 or under

b. _____ 26 - 30

c. _____ 31 - 35

d. _____ 36 - 40

e. _____ 41 - 45

f. _____ 46 - 50

g. _____ 51 - 55

h. _____ 56 - 60

i. _____ 61 - 65

j. _____ 66 or over

69. WHAT IS THE HIGHEST ACADEMIC DEGREE YOU HOLD?   (CHECK ONE)

_____ none

_____ Associate

_____ Bachelors

_____ Masters

_____ Doctorate

_____ Other   Please specify: _____

70. WHAT IS THE AREA (FIELD) YOUR DEGREE IS IN?   (CHECK ONE)

_____ Home Economics

_____ Ag. Sciences

_____ Plant Sciences

_____ Social Sciences

_____ Education/Behavioral Science

_____ Physical Sciences

_____ Other   Please specify: _____

71. NUMBER OF EXTENSION EMPLOYEES IN YOUR OFFICE.

_____ Secretary(s)

_____ Professional staff

_____ Paraprofessional staff

_____ Nutrition aides

_____ Other   Please specify: _____

APPENDIX B

COVER LETTER

COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF ALASKA
FAIRBANKS ALASKA 99701

April 6, 1979

_____ Cooperative Extension
Service Faculty

Dear Co-Worker:

The State Extension Management Information System (SEMIS--you folks call it __-EMIS) has been in operation throughout the nations Cooperative Extension Services for about ten years. There has been much discussion at county, state, and national levels regarding the system with emphasis on how to make the system more useful in the management of our work.

During this ten year period SEMIS has undergone three major modifications. This has been done without the aid of empirical research, except for some descriptive surveys.

The enclosed research questionnaire on SEMIS is designed to determine the relationship of human and organizational factors to user satisfaction of SEMIS. Your state, _____, is the only state being asked to participate in this study because your SEMIS system is the most similar to the latest SEMIS design. If we identify factors that detract from the effectiveness of SEMIS in _____ where it appears to be running as smoothly as anywhere else, then we will be in a better position to recommend improvements in the overall SEMIS system. Also, with a professional staff of about 150 people, we can easily survey the entire faculty thereby facilitating statistical analysis. The selection has been approved by both your state's Acting Associate Director and the Chief, Management Information System Branch, SEA-Extension, Washington, D.C. In addition, you should know this study is being done as my doctoral disseration.

Your answers to the questions will be held in strictest confidence and no report will contain any specific reference to single individuals. In fact, your state's name will not be identified in the dissertation. Also, in working with _____ or other members of your staff, I will not reveal identity of any specific information.

Please complete the questionnaire by April 20, 1979 and return to me in the enclosed self-addressed envelope.

Thank you for your cooperation.

Yours truly,

Harlem D. Sandberg, Coordinator
Program and Staff Development

UNIVERSITY OF ALASKA. AND U S DEPARTMENT OF AGRICULTURE COOPERATING

APPENDIX C

FOLLOW-UP LETTER

COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF ALASKA
FAIRBANKS ALASKA 99701

M E M O R A N D U M

TO: _____ Cooperative Extension Service Faculty

FROM: Harlem D. Sandberg, Coordinator
Program and Staff Development

DATE: April 20, 1979

SUBJECT: SEMIS Questionnaire

On April 9, 1979, I mailed you a SEMIS Questionnaire and asked for
your cooperation in completing it. It is for a research study on the
State Extension Management System used by Cooperative Extension
Service in each state. However, only _____ CES faculty are
participating in the study.

Many of you have completed and returned the questionnaire. Thank you
very much for this cooperation.

For those of you who have not taken the time, approximately 20 minutes,
to complete the questionnaire, I sincerely ask you to do so and return
to me promptly. Your response and participation in this first
empirical research study on SEMIS is helpful and important.

Thank you for taking the time to do so.

HDS:hec

APPENDIX D

SECOND COVER LETTER

COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF ALASKA
FAIRBANKS ALASKA 99701

M E M O R A N D U M

TO: Selected _____ Cooperative Extension
        Service Faculty

FROM: Harlem D. Sandberg, Coordinator
        Program and Staff Development

DATE: May 2, 1979

SUBJECT: SEMIS Questionnaire

To date 102 of your co-workers have returned the SEMIS questionnaire
I sent on April 9, 1979. I'm looking forward to receiving yours so
that I can include your data.

AS I explained in my original letters only _____ CES faculty
are participating in this study. The purpose of the research is to
determine the relationship of human and organizational factors to user
satisfaction of SEMIS. It is the first empirical study of the latest
SEMIS design. _____ involvement has been approved by your
Acting Associate Director and SEA-Extension.

Naturally I am interested in getting as high a return as possible as
it will strengthen the validity of the study, thus I'd very much
appreciate you taking the time, approximately 20 minutes, to complete
the questionnaire and return to me.

Your answers to the questions will be held in strictest confidence and
no report will contain any specific reference to single individuals.

I am enclosing a duplicate copy of the questionnaire in the event you
misplaced the original or it never got to you. If you recently com-
pleted the questionnaire and it "crosses" this letter in the mail,
please disregard this request.

Thank you for your help.

HDS:hec

Enclosure

UNIVERSITY OF ALASKA, AND U S DEPARTMENT OF AGRICULTURE COOPERATING