USER INVOLVEMENT IN SYSTEM DESIGN: AN EMPIRICAL TEST OF ALTERNATIVE APPROACHES

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ABSTRACT

'User involvement' in the development of information systems is often assumed to be key to successful implementation. However, few empirical studies have clearly demonstrated a relationship between user involvement and two key indicators of system success: system usage and user information satisfaction. The authors test the general hypothesis that user involvement is a more complex concept than previous research would indicate; there are different types of involvement and different stages in the system development life cycle in which users may become involved. In a study of 83 users and 23 information systems managers in 23 companies, they found that only the activity of user sign-offs on project phases had a significant correlation with both user information satisfaction and satisfaction with the information systems group. The authors conclude that there is a complex relationship between the type and degree of user involvement and other organizational and individual factors; this relationship affects both user satisfaction with and usage of the resulting systems. Some suggestions for further research taking this complexity into account are given.

1.0 INTRODUCTION

'User involvement' in the development of information systems has been claimed to be the key to successful system implementation [14, 16, 17, 18, 19]. Proponents maintain that user involvement will increase system quality, decrease resistance to change, and increase user commitment to new systems [16, 23]. Research has focused on the relationship between user involvement and either system usage or user satisfaction with the resulting system [9, 21, 33, 42].

Although there is considerable prescriptive literature on user involvement, few empirical studies have clearly demonstrated that involvement directly affects user satisfaction with the resulting system. In this paper, we review significant empirical work and present the results of a study of the relationships between user involvement, user information satisfaction, and user ratings of the information systems group.

The literature review and our own results lead us to conclude that user involvement is less straightforward than previous studies have assumed: there is a complex relationship between the type and degree of user involvement and other organizational and individual factors; this relationship affects both user satisfaction with and usage of the resulting systems. At the end of the paper we

present some ideas for further research to guide us in understanding this complex relationship.

2.0 PREVIOUS RESEARCH ON USER INVOLVEMENT

A number of researchers have examined the relationship between user involvement in system development, system use, and user attitudes toward the system. In this section, the concepts are defined and the research results reviewed briefly.

2.1 User Involvement

User involvement is defined here as participation in the development process by a member or members of the target user group. User involvement can be examined on at least one of two different dimensions. First types of involvement, such as steering committees, representation on project teams, sign-offs on development stages, etc. can be examined as they relate to user attitudes and system use. These types will be referred to as mechanisms for implementing user involvement. The second dimension refers to process: at what stage in the system development life cycle [6] is user involvement appropriate? Although some studies [42, 43] have considered specific stages in the

system development life cycle, few refer to types of activities in which users can become involved. Edstrom [9] has called for research on types of user involvement.

2.2 System Use

'System use' refers to organization members' actual utilization of the system. The literature on 'success' of information systems frequently employs usage by the intended user as an indicator of a system's success [2, 20, 24, 25, 37, 39, 42]. One problem with this indicator is that it is often dependent on whether use is voluntary; if usage is mandatory it will not be a meaningful indicator of system success [24]. Use is also difficult to measure unless the environment of the system permits recording of use (such as an online inquiry system that logs each instance of an inquiry). In experimental situations, simulators often have the capability to record measures of system utilization such as choice of reports requested [8, 17]. Where a measure of usage is not possible information satisfaction may be employed as a surrogate measure of system quality.

2.3 User Attitudes

User attitudes include all perceptions, beliefs, etc. held by the user that affect and are affected by the information system. Among user attitudes anticipated to relate to user involvement are attitudes toward the information systems staff and attitudes toward computers and information systems in general [24].

The authors also include 'information satisfaction' as a type of user attitude. The concept of information satisfaction can be traced to the work of Cyert and March [5]. Their model, depicted in Figure 1, suggests that an information system that meets the needs of its users will reinforce satisfaction with that system. If the existing system does not provide the needed information the user will become dissatisfied with it and will look elsewhere for the needed information.

Since the actual improvement in decision effectiveness attributable to an information system is usually not measurable, 'information satisfaction' (satisfaction with the information provided by the system) is employed as a surrogate measure. If the user (generally the manager) perceives the system as providing valuable information not readily available elsewhere, the system designer can be relatively confident of the 'satisfactoriness' of the

information system for that user/manager.

It might also be argued that, from the perspective of the information systems manager at least, having satisfied users may be as important as having high quality systems. If the organization is not to suboptimize, therefore, it is important that information satisfaction correlate strongly with actual system quality.

2.4 User Attitudes Versus System Use

Several studies have indicated a positive relationship between system use and information satisfaction [2, 42]. System use has also been shown to be related to positive attitudes toward the information systems staff [22, 25, 35]. Robey [34] found a positive relationship between certain user attitudes (i.e., performance, goals, support/resistance, client/researcher, and urgency) and actual system use. Interestingly, the correlation between attitudes and actual use were stronger than those between attitudes and intended use or measures of system worth, suggesting that perceived measures of system quality may be somewhat unreliable measures. Mehra and Alexander [26] found a significant correlation between system Use and measures of the user's perceptions of his or her supervisor's attitudes about the system. Schewe [39], on

the other hand, found no relationship between user attitudes and system use.

2.5 User Involvement Versus System Use

An underlying assumption of the prescriptive literature is that users who are involved in the design of an information system will be more inclined to use it than will uninvolved users [14, 23, 27]. However, what little empirical evidence there is appears unconvincing. Several studies found no relationship between user involvement and system use [10, 17, 25]. Swanson [42], who found both user involvement ('a prior involvement') and system use ('inquiry involvement') to be related to 'appreciation' of the information system, found that the direct relationship between involvement in development and system use was not significant. On the other hand, Alter [1] and Lonnstedt [20] found a positive relationship between user involvement in development and success of system implementation.

2.6 User Involvement Versus User Attitudes

As an important surrogate measure of system quality, 'information satisfaction' is expected to increase when users are involved in system design. Users' attitudes

toward the information systems staff are also expected to be positively related to user involvement.

Several researchers have found a positive relationship between user involvement and information satisfaction [9, 43], 'appreciation' [42], and users' 'perceived influence' [36]. Edstrom [9] found that perceived involvement of the actual system user was correlated with some of the early stages of the system development life cycle. Involvement of user management, on the other hand, was found to be negatively correlated with both the systems analysis and programming stages. Guthrie [12] found a negative relationship between a measure of involvement and a construct he defines as a 'felt need' for information systems. Sartore [38] found some evidence supporting a negative relationship between involvement and information satisfaction. Spence [41] found no evidence of a relationship between either pre- or post-implementation involvement by user managers and information satisfaction.

Powers and Dickson [33] found that participation by operating management in design, formal approval of specifications, and review of projects was positively related to user satisfaction with the information system. On the other hand, they found that utilization of a project team including user personnel was <u>not</u> related to user

satisfaction. They concluded that participation by management, not a designated staff member, was crucial to system success. These results run somewhat counter to those of Edstrom reported above. Lucas [21] found that involvement was not related to user attitudes toward the information systems staff but was related to user perceptions of 'computer potential'.

From the review of the research on user involvement and user attitudes, the authors feel that the evidence so far is inconclusive, and the relationship is complex. First, there are multiple types of involvement, involving different levels of users doing different things. Second, there are different stages of the system development life cycle [6] in which users may become involved. The study described in the next section is an attempt to isolate the types of involvement and stages of development in which involvement occurs that are most critical to the success of the information system.

3.0 RESEARCH VARIABLES

The objective of our study was to re-examine the relationship between user involvement and two types of user attitudes: user information satisfaction and satisfaction with the information systems group. Measurement issues

related to these variables are described in this section.

3.1 Information Satisfaction

User information satisfaction has been measured at both a micro and a macro level. The micro level focuses on satisfaction with a particular information system. Several instruments have been developed for measuring satisfaction at this level [2,4, 11, 15, 24, 25, 33, 40]. These range from the extensive instrument described by Seward [40] to single-item measures.

A macro level measure of information satisfaction assesses user/managers' overall satisfaction with all the computer-based information they use in their jobs. Items in this case focus not on a particular system but on the users' general perceptions of the usefulness of formalized computer-based information systems for the decisions they must make (e.g., planning, controlling, budgetting). Guthrie [12] developed the first instrument of this type. His fifteen-item questionnaire, based on a measure developed by Porter [32] on job satisfaction, examines the difference between a user's 'felt need' for certain types of information to support his or her performance on the job and the amount of such information currently being provided by the information system. The higher the user/manager's

perceived need for information, the greater the dissatisfaction with the system (the greater the 'felt need' for information systems), and vice versa.

A sample item from Guthrie's questionnaire appears below:

Computer-based information to guide and control activities related to my management position:

(a) How much is there now? (min) 1 2 3 4 5 6 7 (max)

(b) How much should there be? 1 2 3 4 5 6 7

To calculate the score the answer to (a) is subtracted from the answer to (b). The item difference scores are totalled resulting in a score which can vary from -90 to +90. A minus score reflects a state of information overload; there is too much computer-based information available. A high positive score means there is not enough. A score of zero is optimal, reflecting a perfect balance between the user's needs and the system's capabilities. In use, the score is almost always positive; apparently few managers actually feel they suffer from information overload.

Guthrie's results indicate that middle managers have a relatively low perceived need for information systems development, implying they are relatively satisfied with

their existing information systems. However, both Guthrie and Nolan [29], who used Guthrie's instrument and reported similar results, interpreted their findings somewhat differently from that presented above. Nolan, for instance, describes the condition of a high perceived need to be a 'positive user attitude'. These interpretations run counter to Porter's original instrument in which positive job attitudes were represented by a low perceived need score. The implication of Nolan's and Guthrie's interpretation is that a user who is dissatisfied with existing information systems is more open to (i.e. has a positive attitude toward) improvements being made in these systems.

We will subsequently refer to Guthrie's instrument as the information dissatisfaction scale. A high score represents dissatisfaction with the current system (i.e., a high perceived need for new sources of information). A low score implies that the user is satisfied with the information obtained from computer-based systems.

3.2 Quality Of The Information System Function

The present study includes a measure of the manager's perceptions of the quality of the information systems group. Two items were used to assess perceptions of how adequately the information systems group meets the needs of the user's

area of responsibility and of the company as a whole. Two more items assessed the user's perceptions of the efficiency and effectiveness of the information systems department. These four items, shown in Appendix A, are averaged to produce an overall measure.

3.3 User Involvement In Information Systems Development

User involvement in the development of information systems may vary widely in degree and type. The present study uses an involvement scale including items drawn from two dimensions of user involvement. The first concerns involvement of users in the various stages of the systems development life cycle (SDLC). The SDLC is the set of stages that any development project should go through, from initial problem statement to final production system. The number and names of these stages vary from author to author but, as Hamilton [13] has shown, each author is describing basically the same process. The stages listed below are those proposed by Davis [6]. On the right are listed types of activities in which users can be involved at each stage. These items correspond to items 1 to 7 in the user questionnaire, shown in Appendix B. Users were asked to assess the amount of responsibility their department had relative to the systems group for carrying out each

activity.

STAGE	QUESTIONNAIRE ITEM
1. Feasibility Assessment	Justifying the proposed application
2. Information Analysis	Determining what reports and/or visual displays will look like Developing an implementation plan
3. Systems Design	Developing an acceptance test plan
4. Program Development	
5. Procedure Development	Developing operating procedures for system users
6. Conversion	Training the users of the system
7. Acceptance	Approval of final systems implementation

The second dimension concerns techniques for implementing user involvement by making organizational changes or by giving the user more responsibility for managing or monitoring the system development effort. The types of involvement that were assessed, with references to the prescriptive literature from which they were drawn, are listed below:

1. Having someone from the user group <u>in charge</u> of the project development group [23].

2. Having users as members of the project development group [3, 16, 18, 19].

3. Having the user group assume ultimate responsibility for the success or failure of the system [23].

4. Having users formally approve or 'sign off' on completion of project development phases [31].

5. Having someone from the user group serve as formal 'liaison' between the users and the systems group [30].

The actual items are shown as numbers 8 to 12 in Appendix B. They were submitted, in slightly different formats, to both the information systems manager and representative users in the organizations surveyed. It can be argued that information systems managers are in a better position to rate how much the user is involved in the development process and, therefore, that their perceptions are the most accurate. Furthermore, combining in the same questionnaire a measure of user involvement with a measure of information dissatisfaction can be expected, via common method variance, to bias any relationships found between the two scales.

The position that user managers are better able to judge their own degree of involvement can also be defended. The extensive literature advocating user involvement could produce a social desirability bias among the information

systems managers' responses. Kling [18] has hypothesized that information systems representatives will overstate the degree of user involvement in system development. In addition, the information systems manager will be responding about involvement among all users in the organization, while it is clear that some users are more involved than others. Users, on the other hand, will only be rating their own level of involvement.

For the above reasons, both the user and information systems manager were asked to rate user involvement for this study. Most studies of involvement have relied on only a single measure, usually user self-reports. A secondary objective of this research is to examine the relationship between such self-reports and ratings by the information systems manager, as a means of providing some validity for the commonly employed self-report measures.

4.0 METHODOLOGY OF THE STUDY

The study was conducted with representatives from manufacturing firms located in New York, New Jersey, and Pennsylvania. An initial survey, mailed to 110 information systems managers, provided background data about the information systems function within the organization. On the basis of this information 40 companies with in-house

computer facilities were contacted and asked to participate further in the study. Twenty-three companies agreed.

Data collection was accomplished through on-site interviews and questionnaires. In each organization a one-hour interview was conducted with the information systems manager. These managers were asked to give some background about their information systems group and to explain their own user involvement practices. They were also asked to identify three or more major information system users. The only constraint on identification of users was that they be managers of departments that heavily utilized information services and who would therefore be familiar with the activities of the information systems group.

The primary data was collected through questionnaires distributed to each of the identified users. The questionnaire included the items shown in Appendices A and B and the Guthrie dissatisfaction scale. Information systems managers also completed a questionnaire assessing their impressions of user involvement. A total of 83 (80%) user questionnaires and 23 (100%) information systems manager questionnaires were received. At least three user questionnaires were returned from each company with many returning four or five.

Statistical analyses were done using Spearman's rank-order correlation coefficient (rho). The use of rho requires no assumptions concerning the distribution of the sample scores.

5.0 RESULTS

Table I shows means, standard deviations, medians, and inter-item reliability coefficients for the measurement scales employed. The mean value of 29.88 for the information dissatisfaction scale compares with a mean of 26.14 recalculated from Nolan's data [28]. Guthrie [12] reports only a median score. His median of 29.7 compares with the study median of 32.0.

Place Table I here.

In Table II are presented Spearman rank-order correlations among the four scales. Since the information systems managers' perceptions of user involvement are organization-wide, it can be argued that correlating these with individual user perceptions is inappropriate. Table III therefore contains the correlations between the information systems managers' perceptions of user involvement and user perceptions averaged over all user responses from the same firm.

Place Tables II and III here

5.1 Measurement Issues

As shown in Table I, the reliability coefficients for each scale are considerably above the .5 to .6 levels considered by Nunnally [29] to be acceptable for exploratory research. The question of scale validity must be raised, however, for the user involvement measures. The practically nonexistent correlations between the user and information systems manager measures of involvement suggest either measurement error or a considerable lack of agreement between user and information systems manager concerning the actual level of user involvement. An examination (not shown) of the individual item inter-correlations among the two scales discloses no pair of items that correlate significantly.

Kling's [18] hypothesis that information systems managers will overrate user involvement is unsubstantiated. Four of the twelve individual involvement items differed significantly between the information systems manager and user ratings. In each case the users rated their own involvement higher than did the information systems manager. One should keep in mind, however, that the information systems managers were rating the typical user while the actual users who responded were usually heavy users of the computer.

5.2 Quality Of The Information System Function and Information Dissatisfaction

No specific hypothesis was made concerning the relationship between these two variables although each was expected to be related to user involvement. It is reasonable to anticipate, however, that a user who is dissatisfied with his or her existing information system will be less inclined to positively rate the information system function. The data strongly confirm this intuition providing at least some support for the construct validity of these two scales.

5.3 User Involvement And Information Dissatisfaction

User involvement was not shown to be related to information dissatisfaction for either the user or information systems manager ratings of involvement. In fact examination of the correlations, shown in Table IV, between individual involvement items and the information dissatisfaction scale resulted in only two significant results. User signoffs on system development life cycle stages (i.e., item eleven from Appendix B) strongly correlated with user dissatisfaction for the self-report measures of involvement. The more users perceived

themselves as signing off on projects the more satisfied they were with their computer-based information systems. Interestingly, this did not hold true for the information systems manager ratings of user involvement, perhaps indicating that users with good information systems were more likely to accept or even exaggerate the role they had played in system development than were dissatisfied users.

Place Table IV here

When the individual items comprising the information systems managers' rating of involvement are examined only item number 2 (designing screen and report layouts) related significantly to user ratings of dissatisfaction. In this case the more the information system manager felt users were involved in this activity the more dissatisfied users tended to be with their information systems.

The above two results, involving individual items, must be interpreted with considerable caution. At a significance level of .05 we would anticipate at least one significant result due to chance alone. Nevertheless, the relationships should be re-examined in subsequent research.

5.4 User Involvement And Quality Of The Information Systems Function

Information systems managers' ratings of user involvement did significantly correlate with user perceptions of the information systems group. The more the information systems managers perceived users to be involved, the more satisfied the users were with the information systems function. This was true at both the individual and organizational levels. Furthermore, although only one was significant, eleven of the twelve involvement items correlated positively with user ratings of information system quality. Interestingly, it was "user signoffs on stages of the SDLC" that once again showed a significant correlation. Those users who signed off on project phases rated the quality of the information systems group higher than those who did not.

6.0 DISCUSSION

Perhaps the most significant finding from the study is the lack of agreement between the user and the information systems manager concerning the degree of user involvement. There are, as described previously, a variety of reasons to suspect the validity of either of the perceptive involvement measures employed. The data confirm these misgivings.

Perceptive measures of involvement have been frequently employed in previous research. On the basis of these results the conclusions of the previous studies must be cautiously reconsidered.

Hopefully, subsequent research will validate a perceptive involvement measure by relating it to user involvement as measured by actual behavior. In the meantime, researchers are urged to obtain perceptive involvement data from multiple sources and to report results for each scale.

The commonly held belief that user involvement contributes to more satisfied users receives almost no support in this study. One possible explanation for this counter-intuitive finding is that we were examining the users' overall information systems rather than a specific system. For a particular user, involvement in new systems might be high but his or her satisfaction with systems already in place could be quite low (or vice versa).

The results relating user involvement, as measured by the information systems manager, to user ratings of the information systems function deserve further research attention. They suggest that the information systems manager who involves users will find those users more satisfied with the information systems function though

apparently no more satisfied with their existing information system. This is particularly interesting given the strong negative correlation between user ratings of information dissatisfaction and their ratings of the information systems function.

7.0 FUTURE RESEARCH ON USER INVOLVEMENT

Our findings and review of the literature have led us to reconsider the relationship between user involvement and information system quality. We feel that future research should proceed along two tracks. First, it should examine the effect of different mechanisms for accomplishing user involvement. Second, it should examine more carefully why users are satisfied.

We suggest a 'process-oriented' view of the relationship between user involvement, information satisfaction, and system use. Initially, a user may be highly satisfied with his or her information systems but not using them. This is represented by the manager who is satisfied with computers as long as they don't change his or her way of doing things.

As a manager begins to use the system, he or she becomes aware of the unfulfilled capabilities of the system, causing satisfaction with it to decrease. Dissatisfaction with the current system (high felt need) in turn encourages the user to become involved in new development efforts. As desires for new information systems are met, satisfaction should be expected to increase again, and the managers can turn their attention to other problems. As involvement decreases, perceived need will begin to increase and the cycle will start again.

This 'process-oriented' view is useful in explaining the lack of results supporting user involvement, both in our study and in previous research. First, high satisfaction scores can be obtained from users who are neither involved in development nor using information systems in their jobs. Second, dissatisfaction with current systems can motivate users to become involved with system development, which would help explain why a positive relationship between user involvement and information satisfaction is not found. Involvement may eventually lead to better systems and greater user satisfaction, but at the time the users are involved, their satisfaction with current systems may be quite low.

Another variable that confounds the process of user involvement is managerial competence. It may be, for instance, that highly competent managers do not rely heavily on "official" information systems but are very satisfied with them; they have little incentive to become involved in system development. At the other extreme, relatively incompetent managers may be reassured by the existence of the same "official" information. The relationship of managerial competence to both user involvement and information satisfaction should ideally be considered. However, the authors realize that "competence" is a very subjective construct and is extremely difficult to measure.

The process view helps to focus the need for further research. We suggest using longitudinal studies to validate this process model. Where possible, measures of system use should be employed to substantiate the information satisfaction evaluations. The motivation of a user to become involved in system development should also be assessed. In addition, different types of user involvement should be assessed in relation to specific stages of the system development life cycle. It may be, for instance, that steering committees are important in the problem definition stage while user signoffs are only useful during installation.

8.0 CONCLUSION

In this paper we have briefly reviewed previous research regarding user involvement in information system development and have presented the results of our own study of user involvement and user attitudes. Our conclusion is that the relationship between user involvement and user attitudes toward information systems is not well understood and is probably more complex than has so far been assumed. We see a need for development of more adequate measures of important constructs. Furthermore, we suggest that a more complex 'process' model of user involvement be used as a guide for further research on user involvement and user attitudes toward information systems.

Appendix A

Items Measuring User/Managers' Perceptions of Quality of the Information Systems Department

1. How adequately do you feel the data processing group within your company meets the information processing needs of your area of responsibility?

1	2	3	4	5
Excellently	Very Well	Adequately	Marginally	Poorly

2. How adequately do you feel the above data processing group meets the needs of the broader class of users they serve?

1	2	3	4	5
Excellently	Very Well	Adequately	Marginally	Poorly

Data processing departments are often judged on two criteria: efficiency and effectiveness. Efficiency, of course, deals with how well they do what they do. Are reports on time? Are projects developed within preset budgets? Effectiveness takes a broader focus. Are they doing the right things? Are critical "life-blood" applications being developed? Are new computer technologies being successfully integrated into the organization?

3. How efficient do you feel the data processing group is?

1	2	3	4	5
Very Efficient	Fairly Efficient	?	Somewhat Inefficient	Very Inefficient

4. How effective do you feel the data processing group is?

1	2	3	4	5
Very Effective	Fairly Effective	?	Somewhat Ineffective	Very Ineffective

Appendix B

Items Measuring User Involvement in Stages of the System Development Life Cycle

The following group of items refers to your responsibilities in system development activities. Please use the following scale in responding to these items.

1	2	3	4	5
Data Processing takes most of the responsibility for this task.	Data Processing performs more than half of this task.	This task is about evenly split between us and DP.	We perform more than half of this task.	We take most of the responsibility for this.

1. Justifying the proposed application (i.e., cost/benefit analysis).

2. Determining what computer generated reports and/or visual display screen formats will look like.

3. Developing an acceptance test plan for validating the completed systems.

4. Developing an implementation plan for use in installing completed systems.

5. Training the eventual users of the system.

6. Developing operating procedures for system users.

7. Approval of final systems implementation, signalling project completion.

Appendix B continued

Items Measuring Types of User
Involvement in System Development

The following group of items pertains to the relationship between your group and the data processing group. Please use the following scale in responding to these items.

1	2	3	4	5
Almost never true	Not usually true	?	Usually true	Almost always true

8. Usually someone from my group is put IN CHARGE of the project development group (the data processing people serve under this individual).

9. My department, not the data processing people, assume ultimate responsibility for the success or failure of new computer-based information systems.

10. Project development groups contain one or more members from my department.

11. As projects pass through the development process someone from my department approves the various phases of project development.

12. I give someone from my group responsibility to serve as liaison with the people from data processing.

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Figure 1

CYERT AND MARCH BEHAVIORAL THEORY OF THE FIRM AND USER SATISFACTION WITH AN INFORMATION SYSTEM

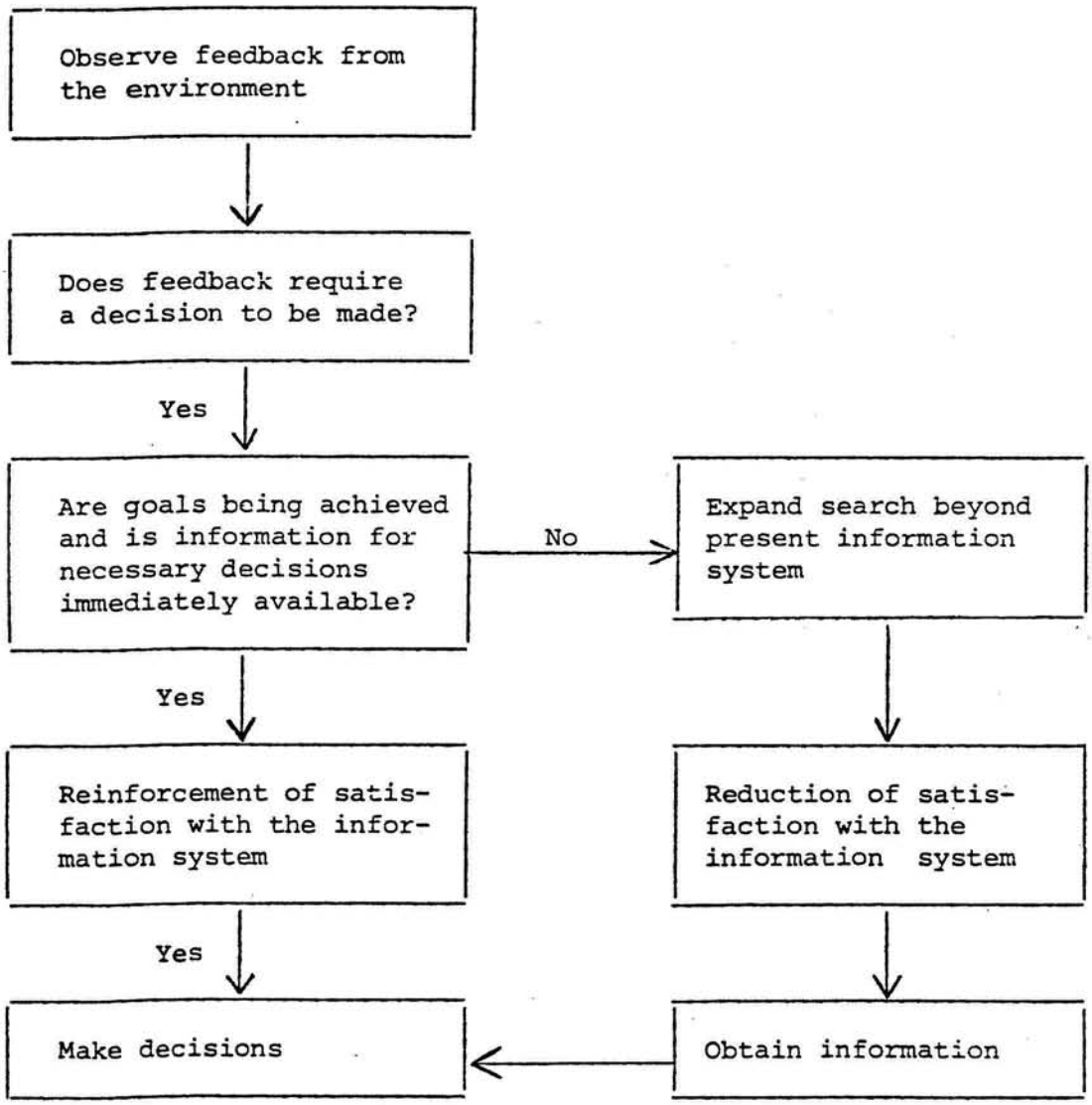

TABLE I

DESCRIPTIVE STATISTICS FOR
RESEARCH SCALES

VARIABLE	N	MEAN	STANDARD DEVIATION	MEDIAN	INTER-ITEM RELIABILITY COEFFICIENT
Information Dissatisfaction	81	29.88	15.51	32.0	.87
Perceived quality of I.S Function	82	3.05	.78	3.0	.86
User Perceptions of Involvement	83	2.95	.76	3.0	.85
I.S. Manager Perceptions of user Involvement	23	2.68	.59	2.5	.74

TABLE II

CORRELATIONS AMONG RESEARCH VARIABLES
(n = 83)

VARIABLES		INFORMATION DISSATISFACTION	I.S. FUNCTION QUALITY	USER INVOLVEMENT	
				SELF-REPORT	I.S. MANAGER REPORT
	Information Dissatisfaction	1.00	-.54***	-.07	-.03
	I.S. Function Quality		1.00	.13	.22*
USER INVOLVEMENT	Self-Report			1.00	-.02
USER INVOLVEMENT	I.S. Manager Report				1.00

* Significant at .05
** Significant at .03
*** Significant at .01

TABLE III

CORRELATIONS AMONG RESEARCH VARIABLES
AT THE ORGANIZATIONAL LEVEL
(n = 23)

VARIABLES	INFORMATION DISSATISFACTION	I.S. FUNCTION QUALITY	USER INVOLVEMENT	
			SELF-REPORT	I.S. MANAGER REPORT
I.S. MANAGER REPORT OF USER INVOLVEMENT	.01	.44**	.00	1.0

** Significant at .03

TABLE IV

CORRELATIONS BETWEEN USER INVOLVEMENT AS RATED BY BOTH THE USER AND THE INFORMATION SYSTEMS MANAGER AND USER RATINGS OF INFORMATION DISSATISFACTION

Stages and Types of User Involvement (items 1-12 from Appendix B)	Dissatisfaction and Involvement as Rated by User	Dissatisfaction and Involvement as Rated by I.S. Manager
1. Project justification	-.02	.15
2. Output design	.00	.50*
3. Acceptance test plan	-.16	-.20
4. Implementation plan	-.08	-.26
5. User training	.00	-.07
6. Procedure development	.11	.03
7. Final system approval	.00	-.25
8. Leadership of project team	.02	-.04
9. Responsibility for project	-.04	-.20
10. Project team membership	.00	.10
11. Signoff on project phases	-.33*	-.20
12. Liaison with I.S. Department	-.19	.20

* Significant at .01