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THESIS

A COMPARISON OF INFORMATION SYSTEMS AND
NON-INFORMATION SYSTEMS PERSONNEL WORKING
IN NON-INFORMATION SYSTEMS
ORGANIZATIONAL DEPARTMENTS

by

Michael E. Pafford
and
Lyle V. Munn

March 1989

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A survey was conducted to investigate motivational and satisfaction differences between Information Systems (IS) and non-IS personnel working in various non-IS organizational departments. The motivational factors of Motivating Potential Score (MPS), Growth Need Strength (GNS), Social Need Strength (SNS), Average Psychological Score (APS), and Overall Satisfaction Score (OSS) were measured. Control for occupational group differences was achieved by classifying survey respondents into one of two job categories: Managerial or Professional/Technical. Significant differences were found in the GNS scores and SNSs of the two job categories. Several implications of the research findings are discussed and recommendations are made with respect to future studies. Keywords: job satisfaction; career potential; [illegible] development; [illegible] management; Military Theses; (KT)

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A Comparison of Information Systems and Non-Information Systems Personnel Working in Non-Information Systems Organizational Departments

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ABSTRACT

A survey was conducted to investigate motivational and satisfaction differences between Information Systems (IS) and non-IS personnel working in various non-IS organizational departments. The motivational factors of Motivating Potential Score (MPS), Growth Need Strength (GNS), Social Need Strength (SNS), Average Psychological Score (APS), and Overall Satisfaction Score (OSS) were measured. Control for occupational group differences was achieved by classifying survey respondents into one of two job categories: Managerial or Professional/Technical. Significant differences were found in the GNS scores and SNSs of the two job categories. Several implications of the research findings are discussed and recommendations are made with respect to future studies.

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I. INTRODUCTION

The rapid proliferation of information technology (IT) has changed the way in which organizations do business. Any large company wishing to maintain or improve its position in its industry finds that it has to increase its use of computers constantly. The growing number of computers is no longer restricted to traditional Information Systems (IS) departments. Almost every department within an organization has become dependent, to one degree or another, upon computers and their software applications.

Three major problem areas have developed because of the rapid rise in the number of computer systems in non-IS organizational departments:

1. Few employees and managers working in non-IS departments fully understand the capabilities of the computer systems they have acquired.

2. Requests from non-IS departments for tailored software or other forms of computer support are overwhelming traditional IS departments. By the time an IS department can provide the needed software or support, the requirements of the requesting department may have changed, thereby rendering the software or support obsolete.

3. IS personnel feel that non-IS workers do not have enough computer systems knowledge to effectively communicate their requirements for tailored software. Non-IS managers believe IS departments are not familiar enough with their special needs to turn out task-specific, quality products in a timely enough fashion. [Ref. 1]

In an attempt to alleviate the above three problem areas

in many information-oriented organizations, non-IS departments have begun hiring their own IS personnel to develop tailored computer applications. More and more IS personnel employed in businesses today work outside of traditional IS departments. Their work includes developing micro, mini, and mainframe computer-based software for use within non-IS functional or operational offices.

There is reason to believe that the use of IS personnel in non-IS departments may create problems for those personnel, however. Research to date has shown that IS personnel exhibit different psychological traits than those of non-IS personnel [Ref. 2]. IS workers within traditional IS departments exhibit very high growth needs but low social needs and low personal interaction and communications skills compared with their non-IS counterparts working in non-IS departments [Ref. 3:p. 26-27]. This would seem to suggest, therefore, that IS personnel hired into non-IS departments within an organization might be working 'out of their element,' their personalities and work habits clashing with those of their non-IS co-workers.

It is the purpose of this thesis to collect data on how IS and non-IS personnel working in the same non-IS organizational departments view their respective jobs and to test whether job motivation, job growth needs, and job satisfaction differ substantially between the two groups.

Findings generated via this thesis should prove useful to at least the following groups:

1. Non-IS department managers looking to hire IS personnel to work in their departments.

2. IS department managers thinking of 'farming out' their personnel to non-IS departments.

3. IS-trained personnel considering work in non-IS organizational departments.

The following outline delineates the research presented in the remaining chapters of this thesis:

- Chapter II reviews current literature, presents the rationale for conducting the thesis research, and states the study's hypotheses.

- Chapter III discusses methodology used in collecting data and analyzing the results.

- Chapter IV presents detailed results of the thesis research with respect to the primary hypotheses.

- Chapter V presents the final conclusions reached as a result of the thesis research. These conclusions are compared with findings from previous studies, and are used in making recommendations for future studies.

II. BACKGROUND

A. REVIEW OF THE LITERATURE

1. The Hackman and Oldham Model of Work Design

Since the mid-1970's, the most widely used theory for examining the link between individuals, jobs, and motivation has been the work design theory of Hackman and Oldham.

Hackman and Oldham's Job Characteristics Model, evolved from the work of Frederick Herzberg in the late 1950's [Ref. 4:p. 9]. Herzberg's work maintained that the primary determinants of employee satisfaction and motivation were features intrinsic to the work itself - recognition, achievement, responsibility, advancement, and personal growth in competence. Building on Herzberg's previous research, Hackman and Oldham developed and tested a more sophisticated model of motivation, subsequently referred to as the Job Characteristics Model (Figure 2.1) [Ref. 5:p. 90].

The model depicts the interrelationships among core job characteristics, psychological states of the person, personal and job outcomes, and the person's growth need strength. The theory suggests that when three "critical psychological states" exist for an employee, high levels of internal work motivation, quality job performance, and worksatisfaction will result; and absenteeism and turnover will decline. These psychological states are: experienced

meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results.

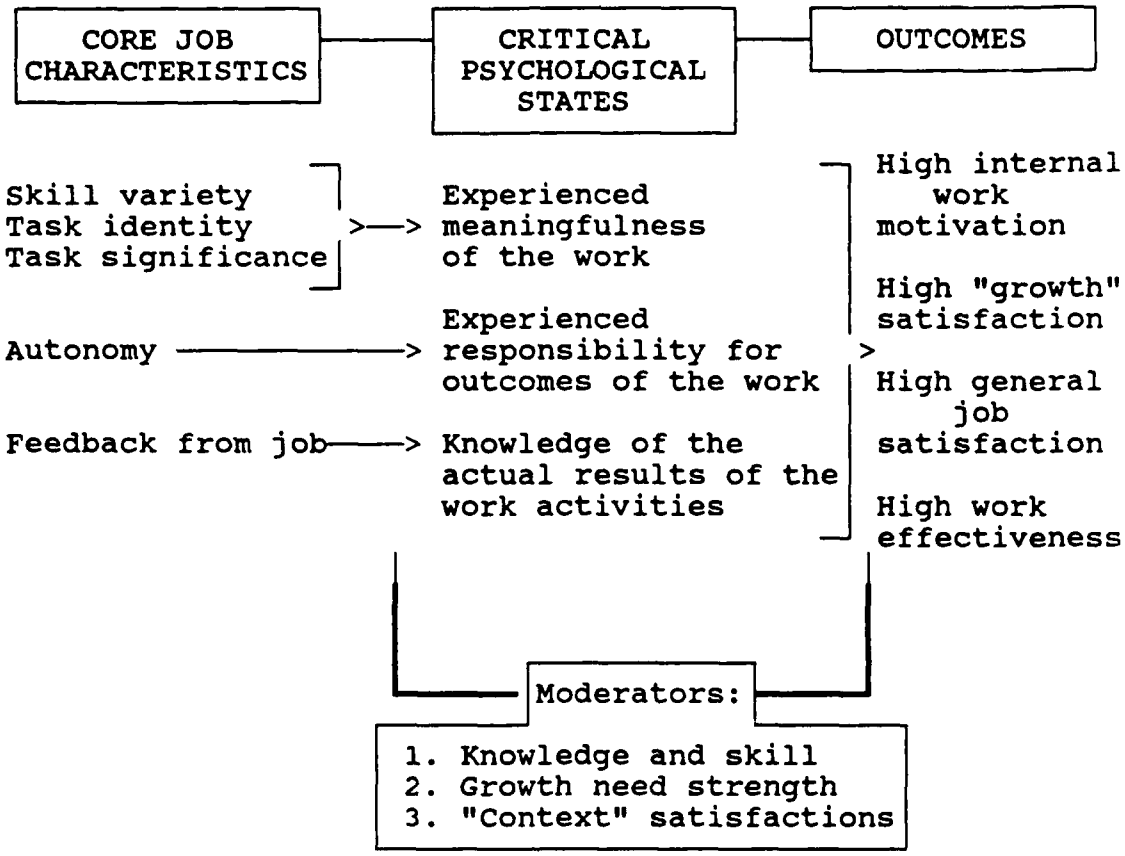

Figure 2.1 The Job Characteristics Model

Hackman and oldham defined the three psychological states as follows:

- Experienced meaningfulness of the work. The degree to which the person experiences the job as one which is generally meaningful, valuable, and worthwhile.

- Experienced responsibility for work outcomes. The degree to which the individual feels personally accountable and responsible for the results of the work he/she does.

- Knowledge of results. The degree to which the person continually knows and understands how effectively he/she is performing the job.

When all three of these conditions exist, Hackman and Oldham assert, a person feels very good about himself or herself when they do something well. These good feelings motivate him or her to try to continue to do well. Behavioral scientists have referred to these conditions as 'internal motivation,' as opposed to external motivation factors, such as incentive pay or compliments from the boss.

Hackman and Oldham used the example of a golfer to illustrate these three psychological states:

> "Consider, for example, a golfer at a driving range, practicing to get rid of a hook. His activity is **meaningful** to him; he has chosen to do it because he gets a 'kick' from testing his skills by playing the game. He knows that he alone is **responsible** for what happens when he hits the ball. And he has **knowledge of the results** within a few seconds."
> [Ref. 5:p. 73-75]

These psychological states are created through various key job dimensions, defined by Hackman and Oldham as:

- Skill Variety. The degree to which a job requires a variety of activities which involve the use of a number of different skills and talents of the person.

- Task Identity. The degree to which a job allows opportunity for completion of a 'whole' and identifiable piece of work.

- Task Significance. The degree to which the job has a substantial impact on the lives or work of other people, either internally within the organization or in the external environment.

- Autonomy. The degree to which the job provides considerable freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out.

- Feedback from the job itself. The degree to which performing the required activities of the job results in the person receiving direct and clear information about the effectiveness of his or her performance. [Ref. 5:p. 78-80]

From these key job dimensions, Hackman and Oldham generated a formula to measure the "motivating potential" of a job, which they designated the "Motivating Potential Score (MPS)":

$$\text{MPS} = \left[\frac{\text{skill variety} + \text{task identity} + \text{task significance}}{3} \right] \times \left[\text{autonomy} \right] \times \left[\text{job feedback} \right]$$

[Ref. 5:p. 81]

Hackman and Lawler theorized that the motivating potential of a job affected people in different ways. They believed that people who valued opportunity for personal growth and accomplishment should respond positively to a job high in motivating potential, while people who did not have such high growth needs would probably feel 'overstretched' by such jobs. Conversely, they theorized that a job that was low in motivating potential would likely frustrate or bore a

person with high growth needs [Ref. 6]. A term Hackman and Oldham used was Growth Need Strength (GNS); defined as the strength of individuals' need for challenge, for moving beyond their present levels of knowledge and ability, for being stretched. [Ref. 5:p. 85-86]

They concluded that high GNS individuals needed to be assigned high MPS work; and low GNS individuals needed to be assigned low MPS work. In both cases, they believed individuals would be motivated because the MPS of their job was matched to their individual needs. Low motivation levels would occur when mismatches occurred; where high GNS individuals were assigned low MPS work or low GNS individuals were assigned high MPS work.

Using their Job Characteristics Model, Hackman and Oldham developed a Job Diagnostic Survey (JDS) questionnaire to measure the variables in their theory [Ref. 5:p. 103]. The JDS quantifiably measures an individual's perception of the five core job characteristics, along with the three psychological states, satisfaction, and his/her desire to obtain growth satisfaction from the job. The JDS has been used in a large number of studies in different organizational settings, mostly involving blue-collar workers. It has provided Hackman and Oldham with a set of norms to aid in the interpretation of results gathered in the future from other workers. [Ref. 7]

2. The Couger/Zawacki Research Program

Drs. J. Daniel Couger and Robert A. Zawacki, working at the University of Colorado during the 1970's, developed a modified Job Diagnostic Survey; the JDS/DP (DP meaning Data Processing). The purpose of the Couger and Zawacki JDS/DP was to measure the job perceptions of people working in the white-collar computer field. Their JDS/DP was a modification of the original Hackman and Oldham blue-collar JDS. [Ref. 8]

Drs. J. Daniel Couger and Robert A. Zawacki built upon the JDS for three reasons:

1) Both the validity and reliability of the original JDS had been substantiated.

2) The Hackman and Oldham database included information on more than 6,000 persons in 500 jobs in more than 50 organizations by the time Couger and Zawacki decided to use it as a foundation.

3) A major objective was to compare their results with prior studies of personnel in other professions. The two researchers' hypotheses on the difference between data processing professionals and other personnel could be most effectively tested if they used the JDS. [Ref. 9]

To preserve the integrity of the original JDS, Couger and Zawacki left the general questions unchanged. A major addition was the inclusion of a measure of Social Need Strengths (SNS), which was found to differentiate between IS employees (with lower social needs) and non-IS employees. Social need strengths are defined as a person's need to interact with others.

Other questions, of less relevance to the present study, were also added and related to:

- employee perceptions of the relative importance of problems relating to maintenance, realistic work schedules, access to the computer, access to supervisors and access to others, and

- employee perceptions of the relative importance of eight categories of compensation. [Ref. 10]

Also incorporated in the JDS/DP prior to its first use were questions established and validated in doctoral dissertation studies by W. E. Rosenbach. In his studies, Rosenbach had expanded the original Hackman and Oldham JDS to cover goal setting and organizational climate/feedback. [Ref. 11:p. 5-15]

Couger and Zawacki's research program for measuring motivation of people working in the IS field is the most extensive in the literature and provides a standard for comparison. They surveyed more than 2500 IS professionals, managers, and operations personnel, representing a wide variety of organizations, in geographic areas across the United States. They developed their data base over a nine-year period with the primary purpose of identifying unique characteristics of IS personnel compared with other occupations. Couger and Zawacki controlled for occupational differences among IS personnel by categorizing them into one of three occupational groups before making comparisons:

1) those doing clerical/operations work,

2) those doing technical or professional work, and

3) those doing managerial work. [Ref. 10]

Couger and Zawacki found that IS personnel in all three occupational groups scored higher in growth need strength than did the corresponding non-IS groups. They also reported substantially lower scores in social need strength for IS professionals and managers as compared with their non-IS counterparts. [Ref. 3:p. 23]

Besides individual differences in motives, Couger and Zawacki found differences in the motivating potential of jobs in the IS field as compared with jobs in other occupations. In the managerial categories, jobs in the IS field scored higher in motivating potential than jobs in non-IS fields. The reverse was true for the clerical/operations group. They noted no differences between IS and non-IS personnel in the technical/professional category. [Ref. 3:p. 34-37]

3. Other Research

K.M. Bartol and D.C. Martin noted during their studies in the early 1980's, as Couger and Zawacki did in the 1970's, that IS technical/professionals and managers had lower social needs than non-IS workers. Their research, which involved a thorough review of the literature on the subject, suggested that IS technical/professionals have a higher need for achievement than those in some other occupations. [Ref. 2]

A 1986 study by Thomas W. Ferratt from the University

of Dayton and Larry E. Short from Central Connecticut State University showed little or no significant difference in the motivational patterns of IS or non-IS personnel working in their respective departments. Their findings contrasted with previous research conducted by Couger and Zawacki as well as Bartol and Martin [Ref. 12].

Ferratt and Short designed their survey instrument to ask questions about the work-unit environment, the organizational environment, and the individual. Some items were adopted from standardized instruments, e.g., variety and autonomy from Hackman and Oldham's JDS, while other items were developed specifically for their study.

The methodology/survey used by Ferratt and Short was purposely different from the JDS and JDS/DP. They believed that the external validity, or generalizability of research findings across time, settings, and persons, is enhanced if the same results are obtained using different methodologies.

Ferratt and Short surveyed both IS and non-IS personnel using the same controls for occupational differences as Couger and Zawacki. Both analyses compared the motivational patterns of IS personnel with the patterns of non-IS personnel in the same occupational groups. The Ferrat and Short investigation found no significant differences for any group, contradicting the results of previous studies. [Ref. 12]

A 1988 follow-on study by Ferratt and Short examined

whether IS and non-IS personnel were motivated differently and whether they should therefore be managed using dissimilar methods. Their survey population consisted of 1005 midwest insurance company employees. Two research questions were addressed:

1. Do work-unit environments differ for IS and non-IS people?

2. Is the relationship of work-unit environment to productivity different for IS and non-IS people?

Ferratt and Short reached the following conclusions as could pertain to Chief Information Officers (CIO):

1. IS and non-IS employees at the same level are motivated in the same way and should not be managed differently.

2. The same work-unit environment should be established for IS and non-IS personnel at the same occupational level.

3. Organizations do not need to establish different programs for managing employees as they become more heavily involved in information systems tasks.

4. Managers should be encouraged to consider distributing IS personnel to various non-IS functional areas. [Ref.13]

Janice Veneri, while a student at the U.S. Naval Postgraduate School, researched the motivational differences between IS and non-IS personnel working in their respective types of organizational departments. She used the Hackman and Oldham JDS to measure the motivational factors of Growth Need Strength (GNS) and Motivating Potential Score (MPS). She also added a series of questions to measure Group

Interaction Strength (GIS), Advanced Technology Strength (ATS), and Change Acceptance Strength (CAS). She controlled for occupational level differences in the same manner as Couger and Zawacki; professional/technical, managerial, and clerical/operational. With the exception of higher ATS for IS professionals, Vaneri found no other significant differences. [Ref. 14]

B. RATIONALE FOR THE RESEARCH

As noted in the introductory chapter, non-IS managers are hiring more and more IS personnel to work exclusively in their departments. However, a number of prior research studies have shown that motivational differences exist between IS and non-IS personnel [Refs. 2;9;10;12;13;14]. Several, although not all, of these studies have concluded that IS people have lower social needs and higher need for achievement when compared with their non-IS counterparts. All of the previous studies have confined research in this subject, however, to IS personnel working in IS departments (e.g. Couger and Zawacki) and non-IS personnel working in non-IS departments (e.g. Hackman and Oldham). Thus the notion that IS professionals would not "fit" into non-IS departments has not been directly tested. What this thesis seeks to investigate are the differences in motivation and job perceptions of non-IS and IS personnel working in non-IS organizational departments - the setting in which "lack of fit" would be expected to occur.

C. HYPOTHESES

This thesis addresses the subject of IS personnel working in non-IS organizational departments and how their perceptions about themselves and their jobs compare with their non-IS co-workers. Self-perceptions are evaluated in terms of critical psychological states, growth need strengths (GNS), social need strengths (SNS), and measures of satisfaction. Job perceptions are measured using five core job dimensions, and combined to obtain a motivating potential score (MPS) [Ref. 3:p. 15-22]. Research for this thesis tested the following null hypotheses with respect to self-perceptions:

H1. There are no differences in the critical psychological states of IS and non-IS personnel working in non-IS organizational departments.

H2. There are no differences in the growth need strengths of IS and non-IS personnel working in non-IS organizational departments.

H3. There are no differences in the satisfaction levels of IS and non-IS personnel working in non-IS organizational departments.

H4. There are no differences in the social need strengths of IS and non-IS personnel working in non-IS organizational departments.

Also tested was the following null hypothesis pertaining to job perceptions:

H5. There are no differences in the motivating potential scores of IS and non-IS personnel working in non-IS departments.

The results of the tests of these hypotheses are tabulated and discussed in detail in Chapter IV.

III. METHODOLOGY

A. GENERAL APPROACH

Data used in this thesis was collected by means of a mailed survey. A total of 600 surveys were sent to 41 IS-related organizations across the United States.

B. SELECTION OF ORGANIZATIONS AND RESPONDENTS

Two specific types of organizations were surveyed: commercial corporations and government civil service organizations utilizing mainframe computer systems. The commercial organizations surveyed were chosen randomly from a two-volume Directory of Computer Executives. The directory listed IS executives working in organizations that utilized at least one mainframe computer system. The government civil service organizations surveyed were randomly identified by contacting Personnel Systems Managers (PSM) at various U. S. Navy bases around the country. The PSMs identified non-IS organizational departments on each base that employed both IS and non-IS personnel.

After identifying a number of commercial and government IS-related organizations, the researchers then contacted by phone an IS executive in each organization. After giving each executive a thorough explanation of the thesis subject, the researchers asked each one the following questions:

1. Would your organization be willing to participate in our research?

2. Does your company employ IS personnel in non-IS departments?

3. Can you identify an equal number of IS and non-IS personnel working in the same non-IS department?

Executives answering yes to all three questions were next sent a letter explaining the research again, as well as an agreed-upon number of surveys, which they were asked to distribute to prospective respondents. The researchers asked the executive points of contact to inform all prospective respondents that taking part in the survey was strictly voluntary and that their responses would be kept confidential. In order to encourage honest answers to survey questions, the survey instructions stated that participants should individually mail back their completed answer pamphlets directly to the researchers. A return envelope was provided in each survey packet for this purpose.

C. THE SURVEY INSTRUMENT

This research used the Couger and Zawacki Job Diagnostic Survey for Data Processing (JDS/DP) [Ref. 3:p. 11-12], supplemented by a set of demographic and biographic questions (See Appendix B). As discussed in chapter II, the survey measures core job characteristics, employees' experienced psychological states, employees' satisfaction with their jobs and work context, growth need strength, and the social need strength of respondents.

Variables in the JDS/DP are measured by the answers to anumber of questions, each one using a seven-point response scale. For example, a participant is asked to indicate via the response scale how much he or she agrees with aparticular statement, or how accurately a statement describes his or her job. A summary score for each variable is then produced by averaging the responses to the group of survey questions that define it.

The present researchers chose to use the JDS/DP to collect data for this thesis because of the population they wished to study - IS personnel working in non-IS organizational departments. The Couger and Zawacki white-collar JDS/DP was designed for IS personnel and has been successfully used in studies of that population.

D. ANALYTICAL PROCEDURES

The participants' answers to the JDS/DP questionnaire were tabulated using the BORLAND, Inc. computer spreadsheet program titled "QUATTRO". The tabulated answers were then transferred to an IBM mainframe computer where they were scored and analyzed using the SAS Institute, Inc. statistical analysis system named "SAS" [Ref. 15]. SAS is a computer program that has routines for describing data and generating statistical analyses.

Means were computed using the SAS procedure MEANS, and levels of significance were recorded utilizing the Student T scores computed. One-way analysis of variance (ANOVA) was

conducted to test the hypotheses. The SAS program called the "General Linear Model (GLM)" was used for this purpose. The GLM procedure uses the method of least squares to fit general linear models. GLM is used in most unbalanced situations, that is, models where there are unequal numbers of observations for the different conditions specified in the model statements. [Ref. 16]

IV. RESULTS

A. RESPONSE RATE AND BREAKDOWN OF RESPONDENTS

Out of 600 surveys mailed to 41 organizations across the United States, the researchers received 173 responses back from personnel working in eight different types of departments in six types of organizations for a total response rate of 28.83%.

Along with a written questionnaire, the survey instrument included a number of demographic/biographic questions (See Appendix B). On the basis of the answers to these questions, respondents were classified as either non-IS or IS personnel, and were placed in one of six occupational categories:

- IS Professional/Technical: programmer/analysts, database administrators, technical advisors, and consultants.
- IS Managerial: first-line supervisors, and department managers.
- IS Clerical/Operations: computer operators and data entry personnel.
- non-IS Professional/Technical: accountants, personnel specialists, military officers, weather technicians, and quality assurance specialists.
- non-IS Managerial: first-line supervisors, department managers and administrators.
- non-IS Clerical/Operations: secretaries, office clerks, and lab and engineering assistants.

Using the above criteria, the respondents were broken out according to the following occupational group distribution:

IS Professional/Technical	82
IS Managerial	19
IS Clerical	0
Total IS Respondents	101
non-IS Professional/Technical	36
non-IS Managerial	24
non-IS Clerical	12
Total non-IS Respondents	72

Although no random sampling technique was used, the respondents to the survey come from a wide variety of organizations and geographic regions, and cover a broad spectrum of professional/technical and managerial levels. The Profile of Respondents in Appendix A shows various distributions of the survey respondents.

Due to the very limited number of responses received in the IS and non-IS Clerical/Operations categories, these survey answers were not included in the data analysis for this thesis. It was assumed that the relatively small number of respondents in these categories was a result of non-IS organizational departments not normally hiring IS personnel to do simple data entry jobs. The total lack of respondents in the IS Clerical/Operations category seemed to reinforce this assumption. Of the 161 responses used, 63.1% were from IS personnel and 36.9% from non-IS personnel. By occupational group the respondents were:

- professional/technical 73.8%.
- managerial 26.2%.

B. TESTS OF HYPOTHESES

This section is organized in the following manner. First, hypotheses are tested using the combined sample of professional/technical and managerial personnel. Then the hypotheses are tested separately for each of these two occupational groups.

1. The Combined Sample

Table 1 summarizes the means of the variables measured by the JDS/DP as they relate to the two primary job groups, IS and non-IS. The column entries represent the means of all responses for each variable. For example, the means for the variable Skill Variety are 6.05 for all IS personnel surveyed working in non-IS organizational departments and 5.80 for non-IS personnel working in similar non-IS departments. The letter "n" represents the total number of respondents in each primary job group.

JDS/DP scale scores were calculated for the sample group. Scores resulted in values for the variables related to the Hackman and Oldham/Couger and Zawacki concepts discussed earlier. Also calculated were two additional variables: Average Psychological Score (APS) (the average of the three "psychological state" variables) and Overall Satisfaction Score (OSS) (the average of the separate satisfaction measures).

TABLE 1

SUMMARY OF VARIABLE MEANS

Variable	Mean non-IS (n=101)	Mean non-IS (n=60)
Job Characteristics		
Skill Variety	6.05	5.80
Task Identity	5.48	5.36
Task Significance	6.01	5.86
Autonomy	5.82	5.62
Feedback (Job)	5.41	5.20
Feedback (Agent)	4.27	4.56
Motivational Potential Score (MPS)	190.56	174.81
Psychological States		
Experienced Meaningfulness	5.55	5.54
Experienced Responsibility	5.90	5.91
Knowledge of Results	5.25	5.33
Average Psychological Score (APS)	5.56	5.59
Affective Outcomes		
General Satisfaction	5.41	5.17
Pay Satisfaction	4.24	4.42
Co-worker Satisfaction	5.74	5.69
Supervisor Satisfaction	4.73	4.94
Overall Satisfaction Score (OSS)	5.03	5.06
Growth/Social Need Strengths		
Growth Need Strength (GNS)	6.13	6.40
Social Need Strength (SNS)	4.05	4.73

As noted in Chapter III, Analysis of Variance (ANOVA) was conducted using the SAS General Linear Model (GLM) procedure to test hypotheses. This procedure was deemed the most appropriate because of imbalances in the number of responses from the two groups.

The results of the hypothesis testing by job groups (IS and non-IS personnel) are presented for each dependent variable in Tables 2 - 6. All five of the null hypotheses were tested at a five per cent significance level-an historically accepted standard.

a. **Hypothesis One**

Hypothesis 1 stated that there was no difference in the Critical Psychological States, and therefore in the Average Psychological Scores (APS) of IS and non-IS personnel working in non-IS environments. Results for the testing of Hypothesis 1 are shown in Table 2.

TABLE 2

HYPOTHESIS TEST RESULTS APS				
MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
5.56	5.59	.05	.83	.835

The Hypothesis Test Results tables are all read in the following manner:

- The **MEAN IS** and **non-IS** columns represent the average of the scores in the group of responses on the JDS/DP that make up the APS. The highest possible value is seven and the lowest possible value is one.

- A total (n) of 101 IS personnel and 60 non-IS personnel responded to the survey.

- The "F" value (calculated by GLM) represents the ratio of the variation between the job group means and the variation between the means within each job group. The larger this number is, the greater the probability that the variations in the means was not due to chance alone.

- The "p" value (calculated by GLM) is the means by which the F value is termed significant. For this study a p value of less than .05 (and therefore above the significance level) meant that the F value was significantly large and the relevant null hypothesis could not be accepted.

- Although the hypotheses are tested using ANOVA rather than T-tests, we have also provided Standard Deviations in the tables for the reader who may be more familiar with with T-tests. All standard deviations in this study were manually calculated. The SAS procedure GLM computed the mean square errors and the researchers took the square root of these mean square errors to arrive at the standard deviations.

The p value in Table two was greater than the significance level of .05. Hypothesis one is therefore not rejected for either job category. In other words, the results provide no evidence of a significant difference between IS and non-IS personnel in terms of APS.

b. Hypothesis Two

Hypothesis two stated that there was no difference in the growth need strengths (GNS) of IS and non-IS personnel working in similar non-IS environments. Results for the testing of hypothesis two are presented in Table three.

TABLE 3

HYPOTHESIS TEST RESULTS GNS				
MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
6.13	6.40	4.12	.04	.843

The p value of .04 is below the significance level of .05 and therefore shows that hypothesis two must be rejected. This indicates that there is a significant difference in the growth need strength (GNS) scores of IS and non-IS personnel working in similar non-IS environments. In this case, growth need strength is higher for non-IS personnel.

c. Hypothesis Three

Hypothesis three stated that there was no difference in the overall satisfaction scores (OSS) of IS and non-IS personnel working in similar non-IS environments. The results for the testing of hypothesis three are shown in Table four.

Since the p value is greater than .05, hypothesis three cannot be rejected, meaning that there is no significant difference in the overall satisfaction scores for IS and non-IS personnel working in similar non-IS environments.

TABLE 4

HYPOTHESIS TEST RESULTS OSS				
MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
5.03	5.06	.02	.88	1.080

d. Hypothesis Four

Hypothesis four stated that there was no significant difference in the social need strength (SNS) scores of IS and non-IS personnel working in similar non-IS environments. The results for the testing of hypothesis four are shown in Table five.

TABLE 5

HYPOTHESIS TEST RESULTS SNS				
MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
4.05	4.73	11.44	.001	1.224

The p value is well below the significance level of .05, signifying that hypothesis four must be rejected. Calculations show that there is quite a significant difference in the social need strength scores of IS and non-IS respondents, with non-IS respondents showing higher social need strength.

e. Hypothesis Five

Hypothesis five stated that there was no significant difference in the motivating potential scores (MPS) of IS and non-IS personnel working in similar non-IS environments. The results for the testing of hypothesis five are shown in Table six.

TABLE 6

HYPOTHESIS TEST RESULTS MPS				
MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
190.56	174.81	1.64	.20	80.20

It should be noted that the highest possible value for MPS is 343 and the lowest possible value is one. The p value is well above the significance level of .05. Therefore, hypothesis five cannot be rejected on the basis of data collected. This means that there is no significant difference between the motivating potential scores of IS and non-IS personnel working in similar non-IS environments.

The next part of this subsection examines the individual components of each of the three composite variables used in hypothesis testing - Motivating Potential Score (MPS), Average Psychological Score (APS), and Overall Satisfaction Score (OSS). The goal was to determine whether unusually high or low scores among the components making up a

composite variable were offsetting each other to the point where their significance was obscured.

f. Core Job Characteristics

Table seven compares the mean scores of the job core variables, of which the first five combine to form the Motivating Potential Score (MPS). As in the case of hypothesis five, which tested the overall MPS of IS and non-IS personnel working in non-IS organizational departments, the F-values for differences in the mean scores for all of the variables fall outside the p less than or equal to .05 significance level. Thus, there was no evidence that any of these core job dimensions was significantly different for IS and non-IS personnel. However, the difference in the mean scores for the skill variety variable (p value of .09) did approach significance.

TABLE 7

COMPARISON OF JOB CORE VARIABLES

JOB CORE VARIABLES	MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
SKILL VARIETY	5.41	5.17	1.60	.21	1.161
TASK IDENTITY	4.24	4.42	.38	.54	1.791
TASK SIGNIFICANCE	5.74	5.69	.08	.77	.954
AUTONOMY	4.73	4.94	.55	.46	1.751
JOB FEEDBACK	5.41	5.20	1.05	.31	1.233
AGENT FEEDBACK	4.27	4.56	1.17	.28	1.670

g. Psychological States

Table eight compares the mean scores of the psychological state variables. As was the case with hypothesis one, which tested the Average Psychological Scores (APS) of IS and non-IS personnel working in non-IS environments, no significant differences in the mean scores of the two groups was noted for any of the psychological states.

TABLE 8

COMPARISON OF PSYCHOLOGICAL STATE VARIABLES					
PSYCHOLOGICAL STATE VARIABLES	MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
EXPERIENCED MEANINGFULNESS	5.55	5.54	.01	.94	1.012
EXPERIENCED RESPONSIBILITY	5.91	5.90	.00	.95	.770
KNOWLEDGE OF RESULTS	5.25	5.33	.18	.67	1.152

h. Satisfaction Variables

Table nine compares the mean scores of the satisfaction variables. As was the case with hypothesis 3, which tested the Overall Satisfaction Scores (OSS) of IS and non-IS personnel working in a non-IS environment, no significance in the mean scores of the two groups was noted.

TABLE 9

COMPARISON OF SATISFACTION VARIABLES					
SATISFACTION VARIABLES	MEAN IS (n=101)	MEAN non-IS (n=60)	F VALUE	p VALUE	STAN DEV.
GENERAL SATISFACTION	5.41	5.17	1.60	.21	1.161
PAY SATISFACTION	4.24	4.42	.38	.54	1.791
CO-WORKER SATISFACTION	5.74	5.69	.08	.77	.954
SUPERVISOR SATISFACTION	4.73	4.94	.55	.46	1.751

2. Occupational Groups

In this subsection, the researchers tested the same hypotheses separately for each of the two occupational groups - managerial and professional/technical. IS managerial personnel were compared with non-IS managerial personnel and IS professional/ technical personnel were compared with their non-IS counterparts. The goal of this breakdown for hypothesis testing was to find out if significant differences in the mean scores, not apparent throughout the first set of tests, showed up in a further breakdown with respect to occupations.

a. Hypothesis One

Table 10 shows how the APSs for managerial and professional/technical IS personnel working in non-IS environments compared with non-IS personnel in the same job categories. No significant differences resulted.

TABLE 10

HYPOTHESIS TEST RESULTS BY OCCUPATIONAL GROUP APS					
JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	5.56 (n=82)	5.61 (n=36)	.08	.78	.876
MANAGERIAL (n=43)	5.57 (n=19)	5.57 (n=24)	.00	.99	.729

b. Hypothesis Two

Table 11 shows how GNS scores for IS managerial and professional/technical personnel working in non-IS environments compared with those for non-IS managerial and professional/ technical personnel. No significant differences were found. This differs from the initial test, where a significant difference between IS and non-IS personnel had been found. The disparity can be explained by the smaller sample size, given the fact that the standard deviations in all three tests were nearly the same.

TABLE 11

HYPOTHESIS TEST RESULTS BY OCCUPATIONAL GROUP GNS					
JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	6.15 (n=82)	6.38 (n=36)	1.78	.19	.843
MANAGERIAL (n=43)	6.04 (n=19)	6.44 (n=24)	2.91	.10	.768

c. Hypothesis Three

Table 12 shows how the OSSs for managerial and professional/technical IS personnel working in non-IS environments compared with non-IS personnel in the same job categories. No significant differences resulted.

TABLE 12

HYPOTHESIS TEST RESULTS BY OCCUPATIONAL GROUP OSS					
JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	5.09 (n=82)	5.03 (n=36)	.09	.76	1.083
MANAGERIAL (n=43)	4.75 (n=19)	5.10 (n=24)	1.09	.30	1.078

d. Hypothesis Four

Table 13 shows how SNS scores for IS managerial and professional/technical personnel working in non-IS environments compared with those for non-IS managerial and professional/technical personnel. Even with the smaller sample size, the differences in the mean scores were significant between IS and non-IS personnel working in professional/technical fields.

Table 13

HYPOTHESIS TEST RESULTS BY OCCUPATIONAL GROUP SNS					
JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	3.94 (n=82)	4.52 (n=36)	5.50	.02	1.227
MANAGERIAL (n=43)	4.53 (n=19)	5.04 (n=24)	2.12	.15	1.151

e. Hypothesis Five

Table 14 shows how the MPSs for managerial and professional/technical IS personnel working in non-IS environments compared with non-IS personnel in the same job categories. No significant difference was discovered in either job category.

TABLE 14

HYPOTHESIS TEST RESULTS BY OCCUPATIONAL GROUP MPS					
JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	189.29 (n=82)	171.52 (n=36)	1.23	.27	80.20
MANAGERIAL (n=43)	196.06 (n=19)	179.74 (n=24)	.74	.39	61.75

3. Composite Variables

As with the combined sample and occupational groups, hypothesis testing was also conducted to determine significant differences in the individual components of the three composite variables.

a. Core Job Characteristics

Table 15 provides a breakdown by job category of the job core variables that comprised the formula for the MPS. None of the variables for either job category showed differences that fell within the selected significance level (p value less than or equal to .05). However, the difference in scores for skill variety in both job categories was approaching significance.

TABLE 15

TEST OF JOB CORE VARIABLES BY OCCUPATIONAL GROUP					
JOB CORE VARIABLES BY JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN. DEV.
PROFESSIONAL/TECHNICAL (N=118)	(N=82)	(N=36)			
SKILL VARIETY	5.97	5.59	3.25	.07	1.062
TASK IDENTITY	5.53	5.32	.77	.38	1.163
TASK SIGNIFICANCE	5.94	5.69	1.32	.25	1.124
AUTONOMY	5.81	5.42	2.82	.10	1.169
JOB FEEDBACK	5.39	5.29	.17	.68	1.287
AGENT FEEDBACK	4.32	4.69	1.18	.28	1.693
MANAGERIAL (n=43)	(n=19)	(n=24)			
SKILL VARIETY	6.39	6.06	3.29	.08	.593
TASK IDENTITY	5.28	5.42	.15	.70	1.125
TASK SIGNIFICANCE	6.30	6.11	.55	.46	.818
AUTONOMY	5.86	5.92	.05	.83	.873
JOB FEEDBACK	5.46	5.07	1.33	.25	1.090
AGENT FEEDBACK	4.05	4.38	.42	.52	1.624

b. Psychological States

Table 16 provides a breakdown by job category of the three psychological variables that were combined to form the APS. None of the scores for either job category showed differences that fell within the significance level (p value less than or equal to .05).

TABLE 16

TEST OF PSYCHOLOGICAL VARIABLES BY OCCUPATIONAL GROUP					
PSYCHOLOGICAL VARIABLES BY JOB CATEGORY	MEAN IS	MEAN IS	F VALUE	p VALUE	STAN. DEV.
PROFESSIONAL/TECHNICAL (n=118)	(n=82)	(n=36)			
EXPERIENCED MEANINGFULNESS	5.52	5.40	.30	.58	1.077
EXPERIENCED RESPONSIBILITY	5.91	5.94	.03	.86	.787
KNOWLEDGE OF RESULTS	5.27	5.49	.83	.36	1.180
MANAGERIAL (n=43)	(n=19)	(n=24)			
EXPERIENCED MEANINGFULNESS	5.70	5.75	.05	.83	.796
EXPERIENCED RESPONSIBILITY	5.86	5.86	.00	.99	.735
KNOWLEDGE OF RESULTS	5.16	5.09	.04	.85	1.069

c. Satisfaction Variables

Finally, Table 17 provides a breakdown by job category of the satisfaction variables that were combined to form the OSS. None of the variables for either job category showed differences that fell within the significance level (p value less than or equal to .05).

TABLE 17

TEST OF SATISFACTION VARIABLES BY OCCUPATIONAL GROUP					
SATISFACTION VARIABLES BY JOB CATEGORY	MEAN IS	MEAN non-IS	F VALUE	p VALUE	STAN DEV.
PROFESSIONAL/TECHNICAL (n=118)	(n=82)	(n=36)			
GENERAL SATISFACTION	5.45	5.08	2.40	.12	1.187
PAY SATISFACTION	4.34	4.36	.01	.94	1.790
CO-WORKER SATISFACTION	5.73	5.58	.59	.45	.970
SUPERVISOR SATISFACTION	4.85	5.08	.42	.52	1.767
MANAGERIAL (n=43)	(n=19)	(n=24)			
GENERAL SATISFACTION	5.21	5.29	.06	.81	1.095
PAY SATISFACTION	3.82	4.50	1.52	.22	1.805
CO-WORKER SATISFACTION	5.77	5.86	.10	.75	.916
SUPERVISOR SATISFACTION	4.21	4.74	1.03	.32	1.690

V. CONCLUSIONS

A. SUMMARY

There are some measurable differences in job perceptions and motivation between IS and non-IS managerial and professional/technical personnel working in similar non-IS organizational departments. The significant differences are confined to differences in the motives of IS and non-IS personnel; in particular their Growth Need Strengths and Social Need Strengths. Non-IS personnel score higher on both needs in our sample.

The finding regarding Social Need Strength (SNS) agrees with previous studies. IS workers (and especially professional/technical personnel) reported less need for social interaction with subordinates, co-workers, or supervisors. Couger and Zawacki also found SNS scores to be substantially lower for both IS managers and professionals/ technicians than for their non-IS counterparts working in their own environments. The implication is that IS managers and technicians do not have a proclivity for group interaction. The finding regarding Growth Need Strength, however, was unexpected. As noted in Chapter two, earlier studies by Couger and Zawacki had reported that IS personnel scored higher on GNS. [Ref.3:pp. 26-27]

Despite the differences in motives between IS and non-IS personnel in our study, however, the study yielded no evidence of a "lack of fit" of IS personnel in non-IS departments. Overall Satisfaction Scores (OSS) and Average Psychological Scores (APS) were no lower for IS personnel than for non-IS personnel in the same non-IS departments. In addition, there was no significant difference in the motivating potential scores (MPS) of IS and non-IS jobs.

B. GENERALIZABILITY OF RESULTS

The discrepancies between current findings and those of some previous studies brings into focus the issue of the generalizability or representativeness of survey results on this topic. Table 18 presents a summary by occupational group of MPS and GNS scores that were found in the present study, as well as the Veneri, Couger/Zawacki, and Hackman/Oldham/Stepina survey results for IS and non-IS personnel. The table also identifies the instrument used in each study.

What is most striking about the table is the large range of differences in mean scores between the studies - even among studies studying the same job group (IS vs non-IS) of respondents in similar departments (IS vs non-IS), at similar levels of responsibilities (managerial vs professional/ technical).

TABLE 18

COMPARISON OF MPS AND GNS FOR PRESENT AND PREVIOUS STUDIES			
CLASSIFICATION OF RESPONDENTS		MPS	GNS
PROFESSIONAL/TECHNICAL			
PRESENT STUDY (JDS/DP)	IS in non-IS DEPT	189.3	6.15
	non-IS in non-IS DEPT	171.5	6.38
VANERI (JDS)	IS in IS DEPT	163.1	5.31
	non-IS in non-IS DEPT	149.8	5.37
COUGER/ZAWACKI (JDS/DP)	IS in IS DEPT	153.6	5.91
HACKMAN/OLDHAM/ STEPINA (JDS)	non-IS in non-IS DEPT	153.7	5.59
MANAGERIAL			
PRESENT STUDY (JDS/DP)	IS in non-IS DEPT	196.1	6.04
	non-IS in non-IS DEPT	179.7	6.44
VANERI (JDS)	IS in IS DEPT	182.4	5.50
	non-IS in non-IS DEPT	184.1	5.24
COUGER/ZAWACKI (JDS/DP)	IS in IS DEPT	199.1	6.32
HACKMAN/OLDHAM/ STEPINA (JDS)	non-IS in non-IS DEPT	155.9	5.30

Possible reasons for the disparity between the three studies include:

- Small sample size in the current and Veneri studies compared with the national databases used in the Couger/Zawacki and Hackman/Oldham/Stepina studies.

- The proportionately high number of civil service respondents in the current study compared with any

of the other two studies, which dealt mostly with private sector organizations.

- Differences in the survey instruments themselves. The current study utilizes the JDS/DP developed by Couger and Zawacki. The Veneri study utilizes a modified Hackman and Oldham JDS. Even though the questions measuring MPS components are identical in all of theses studies, it is conceivable that differences in the remainder of the questionnaires influence scores on these questions.

- Differences in the sampling of organizations and of respondents within organizations.

The major conclusion to be drawn from this comparison is the risk of generalizing from one study to another. Couger and Zawacki, for example, drew conclusions about the differences between IS and non-IS personnel by comparing their own data on IS personnel with those previously collected by Hackman et al, on non-IS personnel. In view of the differences between instruments and sampling procedures between those databases, this comparison now appears questionable. Such comparisons can be made with confidence only between samples using the same instrumentation and sampling procedures.

C. LIMITATIONS OF THE PRESENT STUDY

The researchers are aware that the methods used to conduct their written survey did not allow for total control of the survey population. We are satisfied with several aspects of the study's design. For example, IS and non-IS respondents were sampled from the same non-IS organizational departments, with data being gathered at approximately the

same point in time, and using the same instrument and procedures. However, the actual distribution and administering of the survey by the executive contact person in each organization proved to be genuinely weak points in the research. The researchers could not control the identification of, or the distribution to, an equal number of IS and non-IS survey respondents. A better method of conducting the survey would have been to identify organizations and personnel that could participate and then actually visit the organizations to administer the surveys in person. But because the researchers were full-time graduate students, time and cost constraints prevented them from using this method.

In view of the discussion in the previous section, it should also be noted that generalizations of the results of this survey to the population as a whole should be viewed with caution, due to the relatively small sample sizes, the data distribution imbalances, the fact that this was not a random sample, and the low response rate.

Another potential problem area with mailed surveys concerns the possibility of unrealistic answers being provided by respondents due to a lack of effort, time pressure to fill out the questionnaire, or a desire to purposely mislead the researcher. Hackman and Oldham point out the following:

The JDS is easily faked, and results may be distorted by

tendencies of respondents to present themselves as being consistent in how they respond to various sections of the questionnaire...Special care should be taken to ensure that the respondents believe that their own best interests will be served if the data they provide accurately reflect the objective characteristics of the jobs and their personal reactions to them. [Ref. 5:p. 230].

D. RECOMMENDATIONS

The researchers continue to see utility in comparing the job perceptions and motivations of IS and non-IS personnel. It is worth reiterating the reasons cited earlier in this work, which have to do with the advent of computers in the work place:

- More and more non-IS departments within organizations are bringing micro and mini computers into the work place. Because of the pace at which these computers are being procured, non-IS managers have been forced to hire IS personnel to bring non-IS end users 'up to speed' on computer applications.

- Many organizations are placing IS-trained managers into non-IS departments that have procured computer systems to the extent that traditional non-IS managers are no longer effective.

- A growing number of non-IS departments are choosing to hire their own IS professionals to write tailored software programs rather than contracting out to systems engineering companies or waiting on their own IS departments.

- Organizational management has spent a great deal of time and effort in applying new hardware and software techniques to increase productivity. Studies such as this thesis research can be just as successful toward applying behavioral techniques to improve production as well as enhance job satisfaction.

R.I. Benjamin reported that in 1981, 25 per cent of Xerox Corporation computing resources were dedicated to computer

end users. An end user is defined as any member of an organization who interacts with IS, but who is not employed as a programmer, analyst, or systems operator. By 1991, that percentage is expected to triple [Ref. 17]. Other studies estimate that end use by non-experts consumes 40 to 50 per cent of computing resources, and that this use is growing at a rate of between 50 and 90 percent per year [Ref. 18;19].

The above statistics reinforce the necessity of placing IS personnel into non-IS, end user organizational departments. Future research needs to be directed toward the best possible placement of IS personnel within end user departments. IS technology today affects worker satisfaction, worker motivation, and job content. These in turn, significantly affect the use of information and, therefore, the ultimate success of an organization. If organizations hope to realize the highest level of productivity possible from new technology, there is an urgent need to focus more attention on the IS end user. Until non-IS departments within these organizations are able to grow their own dual-qualified IS and non-IS end users, there will continue to be a need to employ, at least temporarily, IS managers and technicians to conduct end user training and to help non-IS departments get the most out of their information systems.

This research admittedly surveyed a very small sample of the working population and is therefore representative only

of the select organizations from which the surveys were gathered. However, surveys such as these within organizations may help the Human Resources departments to better understand their employees and to better provide for the needs of those employees, and to better understand how to manage those employees.

APPENDIX A

DEMOGRAPHIC/BIOGRAPHIC DATA

	IS IN NON-IS DEPARTMENTS (n=101)	NON-IS IN NON-IS DEPARTMENTS (n=72)
SEX		
Male	64	32
Female	37	40
AGE		
under 20	0	0
20-29	14	8
30-39	35	30
40-49	38	22
50-59	14	10
60 or over	0	2
EDUCATION		
Primary School	0	1
Some Secondary School	4	1
Secondary School	2	12
Some University	40	22
Bachelor's Degree	38	20
Master's Degree	15	12
Ph.D.	2	4

	IS	non-IS
COMPUTER FIELD EXPERIENCE		
1 year or less	2	21
1 to 4 years	18	25
4 to 8 years	33	14
8 to 12 years	22	4
12 to 16 years	12	2
Over 16 years	14	6
MANAGEMENT EXPERIENCE		
Not yet a manager	49	35
1 year or less	7	5
1 to 2 years	6	4
2 to 4 years	14	9
Over 4 years	25	19
NUMBER OF DEPENDENTS		
1	31	19
2	25	14
3	25	13
Over 3	20	26
REGION OF RESIDENCE		
Southeast	38	33
Northeast	10	11
Midwest	17	1
West	36	27

	IS	non-IS
ORGANIZATION		
Manufacturing	6	6
Services	7	9
Education	3	1
Government	80	51
Communication/Electronics	2	3
Computers	3	2
DEPARTMENT		
Personnel/Administration	17	21
Finance/Accounting	11	21
Marketing/Sales	1	3
Production/Supply	1	6
Quality Assurance	6	5
Research and Development	8	6
Computer-related	46	8
Operations	11	2
JOB TITLE		
Professional/Technician	82	36
Manager	19	24
Clerk/Secretary	0	12

	IS	non-IS
PRIOR EMPLOYMENT (last 10 years)		
1-2 organizations	67	47
3-4 organizations	23	19
5 or more organizations	11	6
TIME IN LAST POSITION		
Not previously employed	9	9
Less than 1 year	9	6
1-2 years	23	16
3-5 years	38	20
6-10 years	9	10
Over 10 years	13	11
TIME IN PRESENT POSITION		
Less than 1 year	14	20
1-2 years	25	14
3-5 years	30	21
6-10 years	23	9
Over 10 years	9	8

APPENDIX B

GENERAL INFORMATION QUESTIONS

A. DEMOGRAPHIC DATA

1. For what type of organization do you work? (i.e., government (federal, state, or local), banking, retail, health, manufacturing, electronics, computer industry, communications, transportation, etc.)
   Please specify:_____

2. In which category would you classify your job? (Check one.)

   _____ Professional/Technical
   _____ Clerical
   _____ Managerial
   _____ Production Work
   _____ Sales
   _____ Service

   _____ Other (please specify):_____

3. In what department of your organization do you work? (i.e., Marketing, Finance, Sales, etc.)

   _____

4. What is your job title/description? (Please be specific.)

   _____

5. How many organizations have you worked for in the past ten years? (Check one.)

   _____ 1-2 _____ 3-4 _____ 5 or more

6. If previously employed, how long did you serve in your last position? (Check one.)

   _____ Not previously employed
   _____ Less than 1 yr
   _____ 1-2 yrs
   _____ 3-5 yrs
   _____ 6-10 yrs
   _____ more than 10 yrs

7. How long have you served in your present position? (Check one.)

_____ Less than 1 yr _____ 1-2 yrs _____ 3-5 yrs

_____ 6-10 yrs _____ over 10 yrs

8. In what state do you live?_____

B. **BIOGRAPHIC DATA**

Sex:
(M,F)

Number of Dependents (Including Yourself):
(1, 2, 3, More Than 3)

Education Completed:
(Primary School, Some Secondary School, Secondary School, Some University, Bachelor's Degree, Master's Degree, Ph.D.)

Age:
(Under 20, 20-29, 30-39, 40-49, 50 -59, 60 or Over)

Years In The Computer Field:
(1 Year or Less, 1 to 4 Years, 4 to 8 Years, 8 to 12 Years, 12 to 16 Years, Over 16 Years)

Management Experience:
(Not Yet A Manager, 1 Year or Less, 1 to 2 Years, 2 to 4 Years, Over 4 Years)

For Programmers and Analysts Only:
(Indicate percent of time spent on each element of your job:
Supervision ____%; System Analysis ____%; Development Programming ____%; Maintenance Programming ____%; Other ____% = 100%)

Job Code:
(Directors/Executive, Middle Management, First Line Supervisors and Project Managers, Clerical, Secretary, DP Trainer, Systems Analyst, Programmer/Analyst, Programmer, Systems Programmer, Data Base Designer, Data Communications Specialist, Data Communications Operator, Computer Operator, Data Control (Output Distributor), Operations Scheduler, Data Entry)

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