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A new construct of IS performance measurement: Consonance approach

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A NEW CONSTRUCT OF IS PERFORMANCE MEASUREMENT: CONSONANCE APPROACH

by

Michael Weldon Boyd, BSBA, MBA

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Business Administration

COLLEGE OF ADMINISTRATION AND BUSINESS
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ABSTRACT

The purpose of this research is to create a subjective measurement system that can assist in the successful creation of new information systems (IS). That entails moving from the commonly used objective measures of success (time and money constraints) to subjective measures (people's perceptions).. Literature in the social perception area and goal congruence area has provided a basis for changing the measurement of success. Due to major differences in how people react to stimuli and perceived outcomes the objective measures must evolve to include subjective observations.

This research uses a questionnaire to gather data about the perceptions of the stakeholders (IS personnel and IS end users) involved in production or use of IS. A performance construct and satisfaction construct are used to investigate hypotheses regarding the differences in the perceptions of IS end users and IS personnel. Discrepancy theory is the basis for depicting gaps in the perceptions of the different stakeholders. By creating new constructs related to IS work, performance expectations and perceived outcomes can be measured for IS end users and IS personnel that are involved in creating and maintaining information systems. Current literature supports the involvement of these two stakeholders and the movement to subjective measures.

A process of consonance is also included to insure consistence over time in creating common goals. Consonance is defined as harmony and understanding between stakeholders or people. Consonance is a process that can help achieve consistence in

setting common goals in IS projects. If IS end users and IS personnel are working toward a common goal, higher IS success rates will occur.

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CHAPTER 1

INTRODUCTION

The Information Resource Division (IRD) function in organizations has become a focal point of importance in our business environment. IRD has a major obligation to user computing in both organizationally controlled computing and end user computing. In our rapidly changing business world, new technology and the corresponding daily changes that occur in business operations are not only expensive in dollars spent on hardware, software, and human resources, but are also intricately tied to the organization's future performance, earnings, and overall health and success (Goodhue, 1995). When an organization deals with a function as important as IRD, it is imperative that communication and understanding exist throughout all segments of the organization affected by IRD actions.

There has been considerable research in the area of Information System (IS) success and failure. Failure rates, according to Linberg (1999), are staggering. Over 31% of all corporate software development projects are cancelled prior to completion, almost 53% of all corporate software development projects are costing nearly 200% of the allotted budget, and the average software project success rate is about 16%. Various reports on identifying methods for determining success were inconclusive (Saarinen, 1996).

Many researchers and most organizations use and have used economic measurements to determine success. Economic measures are only one segment of what makes a project a success or failure. There are many resources, other than time and money, used in an IS project. Researchers have expanded their efforts to include the use of subjective measures, along with the objective measures, in an effort to measure IS success. Subjective areas include human resources, organization culture, and project and organizational goal focus.

There are numerous examples of attempts to measure success in the subjective areas; however, an overall measurement that is usable in generic situations has remained elusive. Doll and Torkzadeh (1988) developed an instrument for measuring five components of user satisfaction. These components are content, accuracy, format, ease of use, and timelines. Gap measurement, first used extensively in the marketing area of service quality (Kettinger and Lee, 1994), is another step forward in measuring and defining success of IS. Productivity and quality measures now exist, at the organizational level, which reflect the view of both developers and managers (Zahedi, 1995). These, and others, are measures used to gauge success at the end of a project (DeLone and McLean, 1992). They are not, however, utilized at the beginning of the project, thereby, leaving room for variance in the expectations of all parties involved.

Another problem is that each of the measures reviewed above generally affect a specific group. None encompasses all interested parties. In particular, the literature reflects the idea that IS end users have different interests than IS personnel. IS end users are concerned with system characteristics and a working/service relationship with the IS personnel who are the providers of IS. IS personnel are more interested in the technical

aspects and system quality (Graf and Misic, 1994). The two primary participants in the process, IS end users and IS personnel, are naturally working with different perceptions of needs (Ives and Olson, 1984; London, 1995). The final outcome is often unsatisfactory to one stakeholder, even though the other is pleased. The stakeholders are starting the project with different goals, thus, perceived outcomes will be different and both stakeholders cannot be simultaneously satisfied. There is an obvious need to bring the stakeholders together throughout the development process.

The lack of measures that define the multitude of aspects in an IS, the use of post development metrics, and the failure to bring in a variety of stakeholders into the evaluation system make it difficult to evaluate and predict the performance of an IS (DeLone and McLean, 1992). Management must strive to have agreement among all stakeholders before an IS project commences, if evaluation is to be based on commonly understood metrics. We call this consonance (agreement or harmony among all stakeholders). To attain consonance, a process of aligning perceptions, of all stakeholders involved, is critical before development begins. A consonance building process alerts management to differences in expected outcomes during the planning stages when appropriate steps can be taken for alignment of goals that are acceptable to all stakeholders. The successful completion of the project is more likely with all participants working toward the same outcome.

Theoretical ideas drawn from human resource management and organizational behavior literature will guide us toward goal accomplishment and success. To truly understand a system's success, one must ask whether success can be measured only by time and money constraints, which are very tangible measures, or whether one needs to

incorporate intangible measures to complement the tangible measurements. The intangibles could include, but not limited to, organizational longevity, job satisfaction, user satisfaction, management satisfaction, improved customer relations, and higher quality product. IS research has shown that strictly tangible measurements do not always produce measurable success data (Saarinen, 1996). Therefore, the search continues for measurable success factors that are not tangible such as attitudes and perceptions. This research shows that the concept of consonance between two IS stakeholders enhances mutual satisfaction.

To measure the success of an information system project, all stakeholders must effectively define what makes that project successful or unsuccessful. Once these measures are established, goals and objectives can be set that meet the requirements of all stakeholders involved. The major stakeholders are the organization's management, IS personnel, and IS end users. The IS end user effectively involves participants in the whole organization; therefore, the health and success of the entire organization is involved.

Measurements that encompass all aspects of the process and that try to capture the satisfaction levels and perceptional awareness for both groups have the potential to alert management to possible concerns or problems with the production of the new system. If the consonance process is in place from the beginning, gaps in performance expectations and satisfaction of IS end users and IS personnel can be detected and managed to prevent serious problems that inhibit successful completion of the project.

This study follows a process of building consonance, developed by Klein et al. (2001), that aids in the search for a comprehensive solution to defining system success.

By monitoring the alignment of the needs and requirements of two of the major stakeholders, discrepancies between the two groups can be flagged early in the process. There are two major areas considered in this research. Chapter 2 deals with the creation of a system for comparing the two major stakeholders, the IS end user and IS personnel, and detecting perceptional differences that can lead to potential problems with IS success. Chapter 3 proves there are differences in perceptions of performance and satisfaction between the stakeholders and prescribes what can be done to align the stakeholders' perceptions in order to improve the likelihood of IS success.

The research model of this dissertation provides a graphic display of the foundation for this research (Figure 1). By using the performance construct (Jiang, Sobol, and Klein, 2000) and an existing satisfaction construct (Baroudi and Orlikowski,

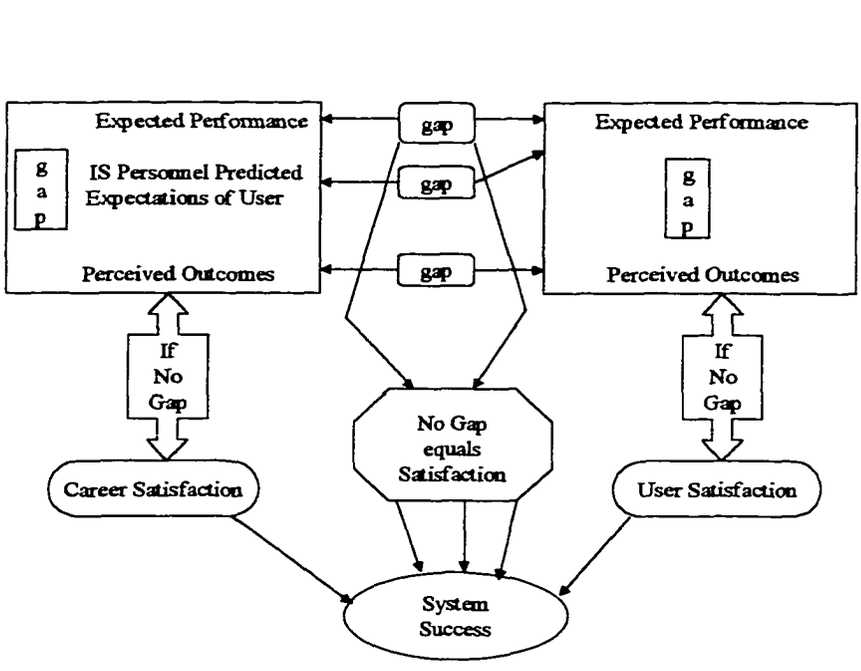

Figure 1. Research Model

1988) in conjunction with tools provided by discrepancy theory (Locke, 1976), it is possible to pinpoint specific gaps and gap effects in the perceptions of the two IS stakeholders.

Chapter 2 explores a new use of current measures to assist the organization in creating successful IS. Traditional objective measures are utilized only after the system is completed. Subjective measures are needed to assist in the planning stages of IS creations. Following the suggestions of several researchers (Linberg, 1999; Saarinen, 1996; Ginzberg, 1981), this research involves testing and creating a more subjective measure for IS success or failure. This measure exposes differences in the perceptions between the two IS stakeholders. Perceptional attitudes of people are an important aspect of creating and implementing IS in an organization (DeLone and McLean, 1992). The judgement issues of what people want, how it should be achieved, and the success of the final outcome are very subjective and difficult to measure. These two primary participants in the process, IS end users and IS professionals, are naturally working with different perceptions of needs (Ives and Olson, 1984; London, 1995). The final outcome is often unsatisfactory to one or both groups involved. Therefore, a concerted effort to bring the stakeholders together throughout an evaluation process is critical (Adelman, 1992). The process must include a comprehensive set of measures that incorporate the views of both user and provider, as well as any other stakeholder (Linberg, 1999). The ability to measure and give feedback on the perceptions of all stakeholders is critical for avoiding IS failures. Linberg suggests that a new paradigm be pursued because all people use paradigms as a filter for what they perceive to be real. Therefore,

measurement must allow for interpretation by a variety of individuals, once a common framework of concepts can be agreed upon.

Discrepancy theory (Locke, 1976) provides the possibility of such a measuring tool. This theory simply states that individuals hold a set of expectations – a set of wants for a product, service or feature. The same individuals also have a perception about how well that want is being met by a provider – i.e., what the individual actually has been provided. A gap between what an individual wants and what they have leads to dissatisfaction. Discrepancy theory can be used to show the gap between a stakeholder's expectations and the stakeholder's perception of the actual outcomes produced in the IS process. Discrepancies or gaps may cover numerous areas, thereby producing a total gap over many dimensions. These gaps are not only present in specific goal areas but also may be prevalent in the different standards set by each stakeholder. Thus, it is imperative for all stakeholders to pursue a common set of goals. This research will develop a common (to all stakeholders) paradigm, which allows interpretation by all stakeholders, and provides a discrepancy measurement framework.

Chapter 3 involves using the differences identified from the performance construct and the use of discrepancy theory to show how the stakeholders are not in tune or harmony with one another. The major emphasis here is on the issues that can cause disruption between the stakeholders and what can be done to correct that situation. In the research model (see Figure 1), this is shown by removing the gap between the expectations of both stakeholders in the beginning of the process and also by reducing the gap between what the IS personnel assume will be the IS end user's expectation. If the producer of a product – IS person – does not understand what the customer wants, the

General congruency theory suggests that behavior is a function of personal and environmental characteristics. According to Nightingale and Toulouse (1977), congruence is a natural state of affairs while working toward the overall goals of the organization even when congruence is forced by rules and regulations that are not congruent with each component of the system. The primary idea is to set goals that all stakeholders are aware of and that are compatible with individual desires. According to goal setting theory, people will perform at their best when they accept expectations as their own goals (Locke and Latham, 1990). An example would be when IRD personnel accept IS end users and IS management's expectations about what the new system should be. Goal setting theory should be used to reduce the conflicting and confusing expectations among all stakeholders. Vancouver and Schmitt (1991) research organizational congruence and look at relationships between supervisor and subordinate, worker and constituents. Both ideas are compatible with IS personnel and end users or IS supervisors and workers. Goal matching between stakeholders is necessary for effectiveness and efficiency in organizations.

Agency theory is closely aligned with social perception theory in that it deals with a person's tendency to perceive and react to a situation in his or her own best interest. Eisenhardt (1989) presented agency theory in terms of supplier and buyer and showed how to resolve the differences or goal outcomes of the two parties.

Maintaining agreement between two groups is essential for success (George and Jones, 1999). Inconsistencies in this area will lead to the pursuance of different goals, which will create different outcomes. The need for maintaining a focus on the common interests shared by the IS personnel and IS end user when creating or maintaining

information systems is imperative. This commonality between stakeholders is difficult to reach because of the different perspectives that each group maintains (Adelman, 1992). Each group's goals may differ because of the perceived importance of different parameters involved in defining the work at hand. Without the common goal to direct both stakeholders, inconsistent decisions could be made by the two groups (Abdel-Hamid, 1999).

By using a new set of performance constructs (Jiang et al., 2000) to measure the importance perceptions of the two stakeholder groups (expected outcomes) and a well established satisfaction construct (Baroudi and Orlikowski) to measure perceived final outcomes, the differences between stakeholder perceptions can be identified through the use of discrepancy theory tools. Creating management awareness about specific problems can start the process of consonance. Consonance can be achieved through better communication techniques and more direct influence in the goal setting process for projects that encompass more than one group of stakeholders. An evaluation and control system for the organization can be improved through the concept known as 360 degree evaluation (London and Smither, 1995).

Many organizations currently use the 360 degree evaluation approach to maintain links between stakeholders that are not directly working with one another. This approach allows significant stakeholders to rate the performance of an individual or group, thereby placing IS personnel and IS end users in a position to receive feedback from one another. Measures used in such evaluation procedures should match the shared goals of the organization in order to encourage personnel to meet the true goals rather than simply

focus on the rewards of the job (Kerr and Bettis, 1987). If IS end users are included in the teams that create IS, team building and organizational learning will be encouraged.

It is time to rethink evaluation systems in order to promote all the advantages of system development and investment (DeLone and McLean, 1992). The organization – and IRD particularly – should expand its view to include more than just the metrics applied to measure success: it should include the organizational culture and practices, the different stakeholders in a new system, and the ultimate goals of the system (Parker, 1996; Weill and Broadbent, 1998). An evaluation process that strives to promote success rather than simply measure success is the ultimate goal (Adelman, 1992). The creation of a system that can detect misconceptions between stakeholders is imperative in today's technology explosion. A system that can detect and regulate such problems assists in achieving success.

This research consists of four chapters. Chapter 1 serves as an introduction to the body of work. Chapter 2 deals with the use of discrepancy theory to find perceptional differences in performance facets between IS end users and IS personnel. Chapter 3 moves to the need of rectifying the differences by explaining what an organization can do to help remove the gaps between perceptions of the IS end users and IS personnel. The process of consonance is used to align common goals for the stakeholders and improve the success rate of new IS. Chapter 4 is a summation of the conclusions for both essays.

Chapter 2 proposes that stakeholders view IS success differently. This proposition is supported by several theories with social perception theory being the most prominent. People are very different and their perceptions of target situations are not always exactly alike. A survey is conducted to gather data on perceptional attitudes of IS

end users and IS personnel. These perceptional differences can be seen by using discrepancy theory as a tool to identify the existence of gaps in performance expectations for both stakeholders.

Chapter 3 deals with consonance and how consonance can improve the success rate of IS projects. It shows that the expectations of IS end users and IS personnel are different from the beginning of new IS. It also illustrates that perceptions the IS personnel have about the IS end users expectations can be incorrect. The emphasis of this chapter is on goal setting and aligning expectations from the beginning.

CHAPTER 2

DISCREPANCY BETWEEN DESIRED AND ACTUAL PERFORMANCE OF INFORMATION RESOURCE DEPARTMENTS: TWO VIEWS OF SUCCESS

Introduction

The importance of information systems within most business organizations today is very critical. The explosion of new technology and the refinement of existing technology are closely related to an organization's performance, earnings, and future ability to maintain its competitiveness (Goodhue, 1995). With IS so vital to a business's future viability, the necessity to create and maintain the systems that contribute to its health is very important. The ability of the organization's different components to operate simultaneously within a framework of common goals that reflect a common outcome is very essential, as this directly impacts the health and success of the whole organization. The ability to promote the commonality between stakeholders during the IS planning stages should improve the probability of the successful creation of new information systems or the refinement of existing ones.

Success has been an elusive target for many organizations. Part of the problem lies in defining success and deciding what elements to include in that definition. Over the past several years, the elements used to define success have expanded from the traditional objective measures of time and money to include less measurable, subjective elements that include perceptional attitudes and the needs of the people involved in IS development or refinement (Ginzberg, 1981; Saarinen, 1996: Linberg, 1999). One of the main reasons for including these new elements is the low success rates for software development. Linberg (1999) published data that showed poor performance in successful completion of IS software projects. Linberg's data reflected a 31% cancellation rate on corporate software development projects before their completion. Fifty three percent of the projects exceeded budget by almost 200%, while the average project success rate was calculated at approximately 16%. To improve the success rate, the stakeholders must be guided toward outcomes on which there is consensus.

A beginning step is the ability to recognize the different perceptions and expectations that may be held by many of the stakeholders, particularly, IS end users and IS personnel. The perceptions of those things needed to accomplish certain tasks may be different for each stakeholder. This was pointed out by Ross and Fletcher (1985) and Schiffmann (1990) in their work on social perception theory. DeLone and McLean (1992) also supported the importance of the synthesis of different stakeholder ideas and attitudes during the IS planning process. For example, one of the main problems inherent in synthesizing stakeholder perceptions and expectations relates to their different cognitive approaches. IS end users are more concerned with the relationship between the user and IS personnel and how user friendly the system will be. IS personnel create the

new software and are usually more concerned with the technical aspects of how the program can be developed and the quality of the overall system when the new project is completed. Both stakeholders may be aware of these issues; however, because of their specific and unique backgrounds, their primary interests usually lie in different areas. To increase success rates, allowances for the divergent stakeholder interests must be considered.

To help achieve a compatibility of all stakeholder interests, a comprehensive set of measures needs to be developed that will incorporate the perceptions of the stakeholders (Linberg, 1999). This would enhance the ability to acquire feedback, from the participants, that can be used during the planning stages of the project. The data gathered about perceptions could then be reviewed during the planning stage to create a process that would be inclusive of all stakeholder input and more likely to be agreed upon by the varying participants. The feedback can be used to educate all participants about the different expectations identified.

This research presents a performance construct that is capable of identifying different perceptions from different stakeholders (Jiang et al., 2000). Discrepancy theory (Locke, 1976) is used as a measuring tool to point out gaps between the stakeholders' perceptions at the beginning of a project. With this information, management can then focus the stakeholders on a process that will produce an outcome that is more acceptable to all and that is compatible with management's goals. This research also relies on Linberg's (1999) suggestion referencing the establishment of a paradigm to create a filter to help people arrive at a common point of expectation. A performance construct that is understood by all stakeholders can be a part of this commonality.

Literature Review

Human behavior is a concept that is unique to each individual. The study of individual behavior has shown that each person reacts to their environment differently based on their own schema of knowledge and past experience. When dealing with individual people and groups of people, a researcher must consider the effects of human behavior and how these individuals will react with one another. As a result of his studies of human behavior, Maslow (1970) developed a hierarchy of needs. Alderfer (1972) and Wahba and Bridwell (1976) identify other basic needs to add to Maslow's list. Study in the area of human needs and perceptional attitudes continues.

From this point, the literature review explains the natural progression of past research leading to the current research structure. We begin with a review of how rating scales evolved and move on to the introduction of the IS end user into the IS provider realm of information systems. The differences between the stakeholders (IS end user and IS personnel) were explored for problem areas and measurements that could be statistically explained. This literature review serves as a guide through management's function in the consonance process and to how social perception theory is used in the current research. The last area pertains to discrepancy theory and how it is used in this project.

Arvey and Hoyle (1974) began the development of behaviorally based rating scales for IS systems analysts and programmers. Inherent in this pursuit was the basic development of lists of possible dimensions that could be explored and identified as proper statistical methods to be used to determine the consistency and reliability of the measures. Among the methods used are the Guttman scaling procedure, Cronbach's

alpha, and correlation analysis. Some of the dimensions that Arvey and Hoyle address in the behavioral study of system analysts and programmers include (1) technical knowledge, (2) planning, organizing, and scheduling skills, (3) maintenance of customer relations, (4) provision of supervision and leadership, (5) the training of others, (6) documentation, (7) maintenance of communications, (8) assessment of customer needs and formulation of recommendations, (9) job commitment and effort, (10) debugging, (11) program modification and development, and (12) conducting presentations.

Kaiser and Srinivasan (1982) introduce the IS end user into the provider (IS personnel) realm of IS. They began by evaluating the attitudinal differences of analysts and users and investigated the idea that differences between IS personnel and IS end users could cause problems in the development and success of IS. They developed five measurable factors: (1) user-analyst communication, (2) user needs focus, (3) systems staff competence, (4) development methodology, and (5) information systems potential. This study was a beginning step in showing that situational differences exist between the stakeholders involved, requiring the development of metrics from the viewpoint of the user as well as the technical views of the IS professional.

Cheney and Dickson (1982) researched the area of IS end user satisfaction in the organizational setting to determine whether or not satisfaction affected IS end user performance. They also investigated the characteristics of the IS department and how those characteristics affected the performance of new IS projects completed by the department. They concluded that the managerial portion of creation and implementation is much more important to the use of the system than are the latest technological advances. Without IS end user support and understanding, the IS function loses validity.

Porter, Crampton, and Smith (1976) created a questionnaire that operationalized organizational commitment, thus pioneering the concept of operationalization by questionnaires. Bailey and Pearson (1983) developed a definition of user satisfaction which they were able to operationalize into an instrument for collecting data that measures this satisfaction. Ives, Olson, and Baroudi (1983) expanded on this research to create the user information satisfaction (UIS) instrument that is commonly used for measuring IS end user information satisfaction. IS end user satisfaction, as measured by the UIS, was found to be a surrogate for system success (Saarinen, 1996; Linberg, 1999). The UIS does not recognize the need for metrics that may be common to or have similar meaning to the stakeholders.

In their work on social perception, Ross and Fletcher (1985) helped explain the cognitive process of studying and storing perceived facts about people and situations and how people draw on that perceived information at later times to help them understand the present surroundings and situations. The perceptions tend to be very individualized to the person who has stored that information; thus, each person perceives differently as a result of personal past experiences. Adelman, Rook, and Lehner (1985) look at perceptions of groups. Each group has different perceptions of the same target and the importance of that target. Griffin, Bateman, Wayne, and Head (1987) gave an explanation (social information processing model) of what causes people to expect certain outcomes from jobs and why they tend to perceive situations in a specific way (social perception model). Schiffmann's work (1990) supports the findings of Ross and Fletcher (1985).

Dos Santos and Hawk (1988) investigated IS end users and IS personnel characteristics. IS end users were concerned with user friendly characteristics and worker

relationships with IS personnel. IS personnel were more concerned with system technical aspects and quality. Green (1989) was at the forefront of research in the area of aligning IS end user needs with IS personnel job performance. Green's interest in perception differences between the two stakeholders stemmed from three observations: (1) there are differences in needs of public sector companies and private sector companies; (2) more functional areas are included in the private sector companies; and (3) there is the perception that system analysts in the private sector are of a higher quality than those in the public sector. Green's research reveals there is a distinct difference in the perceptions of IS personnel and IS end users regardless of the sector in which they are employed. This led to further work on the user side of successful systems development. Franz and Robey (1984) pointed out the relationship between the two stakeholders and the outcome of the project being successful.

Davis (1989) performed an in-depth review of literature pertaining to theoretical issues in the areas of IS end user perceived usefulness and the perceived ease of use of individual IS applications. The author investigated several theories, including expectancy theory, self-efficacy theory, and behavioral decision theory, and how these theories relate to usefulness and ease of use. Doll and Torkzadeh (1988) researched the satisfaction of end users in computing. They worked with previous instruments seeking to improve on factor identification, and moved from semantic differential scaling to Likert-type scales. They moved from a traditional model of data processing users (part of IRD) which specifically includes IS professionals, to a model that includes only IS end users (EUC, end user computing). While these metrics are restricted to use in a single group, inclusion of many groups in evaluation can be valuable (London and Smither, 1995).

Discrepancy theory (Locke, 1976) considers individual differences to be important to perceived outcomes. Different people will have different outcome perceptions of the same project even when measured with the same metrics. Discrepancy theory recognizes the lack of consideration for individual differences and claims that job satisfaction is related to the extent to which outcomes (such as IS system compatibility and ease of use) match those desired by the individual. The closer the match - that is, the more a stakeholder receives what his or her desires dictate - the higher the level of satisfaction. In addition, the outcomes that people value may not necessarily be represented in need categories (Alderfer, 1972; Maslow, 1970). The important issue of discrepancy theory is the perceived "gap" between aspects of the project outcomes one has and one wants (desires). Larger gaps result in more dissatisfaction, and smaller gaps result in more satisfaction (Locke, 1976).

Behavioral researchers have empirically supported the relationship between gaps and satisfaction. For example, Rice, McFarlin, and Bennett (1989) found that smaller discrepancies between an individual's desire for a specific outcome and the individual's perceived end outcome were associated with higher levels of satisfaction. Using job facets (pay, promotion, etc.) to measure satisfaction levels, this research was able to show that two individuals in the same job had different responses toward the same outcome. The results highlight an important distinction between discrepancy theory and previous needs theories: desired aspects are not the same for all people, and satisfaction varies by individual values and personal perception of discrepancies. These findings would indicate that facet satisfaction is determined, in part, by discrepancies that result from a

psychological comparison process that includes an individual's current experience as compared to some personal standard of expectation.

The psychological comparison process can produce both positive and negative discrepancies. Positive discrepancies or gaps are experienced when the amount of service expected by the IS end user is less than the IS personnel's perceived standard of delivered services (e.g., project outcome is better than expected). Negative discrepancies are experienced when IS end users receive less service than they desire. As noted by Locke (1976), the effects of discrepancy (positive and/or negative) depend on the specific person's perceived outcome. Rice et al. (1989) predict that positive discrepancy effects usually occur in effort requirements (e.g., hours required to complete a job) but not in opportunities (e.g., promotions or learning new skills). If the theory holds for wants in the IS field, then the gaps that exist for a set of common measures allows for ready interpretation of performance.

In summary, social perception theory allows that the various stakeholders will view metrics of success differently. Discrepancy theory allows that the gap between what each individual stakeholder wants and perceives to have is related to overall perceived performance. In terms of the IS professionals in the IRD and the IS end users of the IRD products and services, we expect that the views between the two stakeholders will be different and, for each stakeholder, a discrepancy in "wants to haves" will relate to overall satisfaction. This leads to the hypotheses below. First, IS end users and IS professionals will view the same metrics differently, a condition necessitating more comprehensive metrics and establishing a base for the use of discrepancy theory (H1 and

H2). Second, any gaps between the haves and wants of a stakeholder will be strongly related to a more common measure of satisfaction for that stakeholder (H3).

H1: There is a difference between IS end users and IS personnel ratings on the importance of IRD job performance measures.

H2: There is a difference between IS end users and IS personnel ratings on the perceived delivery of IRD job performance.

H3: A positive gap between IS end user wants and haves is associated with lower user satisfaction.

Methodology

Data Collection

A sample of ninety three mutually exclusive pairs of IS end users and IS professionals was taken from several geographic areas including Texas, Arkansas, Colorado, Kansas, Oklahoma, and Missouri. This sample was gathered through the distribution of a questionnaire. IS professionals are defined as those responsible for working with IS end users to gather and analyze information about current and future information systems for the organization (Misic, 1996). They are also responsible for gathering information from the IS end users, solving problems, making system improvement proposals, training the IS end user, and delivering and setting up finished system products. The IS end users in this study include anyone in the organization who had need of IS support. This includes all levels of management, professionals, staff members, and in some cases, other IS personnel. Anyone who has a need to use information systems in their daily routine is considered an IS end user. The IS end user should also play the role of "participant" in the analysis of needs and design of the systems.

The IS end users and IS personnel participants had to be working together currently or recently worked together on a specific project or extensive job task. Contact was generally made with upper level management and then taken to the IRD management person. The importance of matched pairs was reemphasized and the requirement that each of these pairs had worked together in the recent past on a specific project or extensive job task was the guideline for contacting the participants. The distribution of the questionnaires was conducted on a personal contact basis by the researcher or authorized agents. Complete confidentiality was maintained for all participants. The only requirement was the use of some identification mark (task or project used as basis for the answers presented in the questionnaire) to identify the company and the projects within the company in terms of pair alignment. Company officials and/or supervisory personnel were not allowed to see the completed instruments.

The questionnaires were identical for the IS end users and IS professionals except for the satisfaction scale (see Appendix). A total of 229 questionnaires were returned to the researcher and 214 of those returned were complete. Out of the 214 completed there were 93 pairs. There were 93 IS personnel questionnaires and 121 IS end user questionnaires. Several of the IS personnel questionnaires were matched with more than one IS end user. When this occurred, one of the multiple matched IS end user forms was chosen randomly to pair with the IS personnel questionnaire, discarding the remaining IS end user forms.

Certain demographics were requested on IS end users and IS personnel questionnaires, for results see Table 1. The data shows the number of male and female respondents in each group, along with the average age and range for age. For IS

personnel, there are four general job descriptions and the total people in each area. There is also the average number of years that the IS personnel have spent in user support area, with least number of years and most number of years reported. The last statistic gathered on IS personnel is about their job assignment. It identifies the number of respondents assigned to the IS department, the number of respondents assigned to other operations

Table 1. Demographics

IS Personnel		IS End Users	
Total Surveyed:	93	Total Surveyed:	121
Gender:		Gender:	
Male:	63	Male:	71
Female:	30	Female:	50
Age:		Age:	
Average:	38	Average:	27
Range:		Range:	
Youngest: 23		Youngest: 19	
Oldest: 63		Oldest: 61	
Job Description:		Job Description:	
Customer Support:	42	Supervisor:	55
Systems Analyst:	22	Professionals	66
Project Leader:	11		
Manager:	18	Supported by IS Professional (yrs.):	
		Average:	7.3
Time spent in User Support Area:		Low: 0.25	
Average (yrs.):	11	High: 25	
Least: 1			
Most: 34			
Work Assignments:			
Assigned to IS Department:	75		
Assigned to an Operations Department:	12		
Assigned to IS but on Loan to Operations Department:	6		

departments, and those individuals who are generally assigned to the IS department but who are on loan to another operations department.

Constructs

The present research examined IS personnel performance and IS end user and IS personnel satisfaction. The IS personnel performance construct, which is used as a base for this study, was first introduced by Jiang et al., (2000). It is a performance based construct which consists of seven categories. The satisfaction construct is for the IS end user. The UIS instrument (Baroudi and Orlikowski, 1988) was used to measure IS end user satisfaction.

Performance Construct. Jiang et al., (2000) used the performance constructs in an earlier study. They were looking for three essential qualities in these performance constructs. First, the measures must represent many aspects of the process development; secondly, the measures must be recognized and validated in prior research, and thirdly, the measures must be recognized and understood by both IS professionals and IS end users.

A questionnaire containing seven categories of performance was used to measure the perceptions of the IS end users and IS personnel as to the importance of each category. The seven categories are: quality, project work, general task, personal quality, dependability, teamwork and leadership, and career related training. The items in each construct segment are displayed in Table 2. Respondents were asked to indicate the importance of each issue on a five point Likert-type scale ranging from (1) not important to (5) very important.

individual ranking a specific project relative to the work performed by the IS personnel. The categories of work that are considered are delivery or implementation of specific software or programs, understanding of proper procedures to be used, proper use of appropriate tools, and the effectiveness and conciseness of the overall performance in these areas (DeLone and McLean, 1992; Saarinen, 1996; Zahedi, 1995). Questions that pertain to technical quality were avoided because of the inability of the IS end users to accurately judge that area of expertise. The IS end user's perceptional view of the IS personnel performance is very important to the relationship of the two in future interactions. Quality of the product and professional use of tools and procedures should leave a favorable impression with the IS end user about the capabilities of the IS personnel member. This could be very important in future interactions between the two groups. If rapport and respect are not established early in the relationship, the probability of future problems may increase. Quality should be important to the IS personnel for its role in building self-esteem, self-confidence, and facilitating future interaction with the IS end users. Performing at quality levels in the beginning will also decrease the probability of future problems that can occur in a system if quality issues are not stressed. Likewise, efficiency and effectiveness in time and materials used are generally associated with quality. If quality is present in all resources - machines, programs, and personnel - productivity usually goes up, and cost usually goes down.

Project work is associated with project management transactions. The performance criteria that are measured in this construct determine: if objectives and scopes of the project are thoroughly defined, if the creation of accurate time tables and information about the impact on IS end users' job are provided, how well the project is

planned from start to finish, if meeting schedules and predetermined requirements are met without exceeding resource estimates, and if timely and accurate reports are delivered throughout the entirety of the project. Prior research has defined these objectives (Jones and Harrison, 1996; Saarinen, 1996). These are issues about which IS end users should be knowledgeable and in which they should be involved. Congruency theory (Bourgeois, 1980; Vancouver and Schmitt, 1991) and social perception theory (Baron and Byrne, 1991; Ross and Fletcher, 1985; Schiffmann, 1990) stress mutual goal knowledge and mutual involvement. This type of process will increase productivity and promote understanding and acceptance of the project. When the two major stakeholders communicate and work toward a mutual set of goals, the levels of efficiency and effectiveness in the organization are increased.

The general task factor looks for performance in response time, problem solution application, awareness of user needs, ability to resolve application and system problems, and the supply of knowledge and hardware for new technologies. All of these requirements are an integral part of the IS function and an attribute that the IS end user highly desires (Grupe and Kilari, 1994; Sullivan-Trainor, 1988). Timely response is an efficiency issue in any type of performance and also increases satisfaction for IS end users. Anticipation of needs is a sign of a good perception skill, on the part of the IS personnel, that improves satisfaction for the other stakeholders. Persistence in problem solving and advance notice and training on new hardware and other technological advances are performance measures that are desired by the IS end user. These also enhance the self esteem of the IS personnel. Meeting these types of needs is compatible

with congruence theory (Vancouver and Schmitt, 1991) and social perception theory (Kaiser and Srinivasan, 1982; Baroudi, Olson, and Ives, 1986).

The fourth category of the performance questionnaire is personal qualities. This construct deals with the interpersonal skills of the IS personnel. It investigates their efforts to listen and understand the desires and needs of the IS end user. It also measures the respect that the IS personnel affords the IS end user, along with the ability of the IS personnel to build cooperative relationships and to enhance and generate dialog between themselves and the IS end user (Green, 1989; Lee, Trauth and Farwell, 1995; Silver, Markus and Beath, 1995). The IS personnel should be very concerned with maintaining good relations with the IS end user in order to meet the project objectives with consensus from all parties.

Dependability is the fifth construct of the performance importance section of the questionnaire. Dependability deals with the IS personnel having met previous commitments and their willing acceptance of new assignments. The dependability questions check for satisfactory performance in the areas of follow-through and follow-up and search for the ideal situation of completion with eagerness to excel (Green, 1989; Grupe and Kilari, 1994; Lee, et al., 1995). Excitement and motivation are abstract concepts within an organization's culture that - once instilled - can become regenerating with little effort from the upper levels of the management team. Through cooperation and communication between the IS end users and the IS personnel the levels of dependability will increase because the IS personnel have a better understanding of the Is end users expectations.

Teamwork and leadership is the sixth construct of this performance importance section of the questionnaire. The leadership questions are designed to measure the ability of the IS personnel to encourage pursuit of current project goals and other non-project related efforts, while leading the team toward stated objectives. The IS personnel should also be able to coach, instruct, and support other IS personnel in the pursuit of quality and completion of the goals and objectives defined for the project (Green, 1989; Grupe and Kilari, 1994; Lee, et al., 1995). The IS end user is capable of recognizing these abilities while working with IS personnel on a project. At the same time, the IS end user will be impressed and motivated by the exuberance displayed by the team leader or discouraged if that leadership quality is not detected.

The final construct of performance importance deals with the career aspects of the IS personnel. If there is a relationship between the IS end user and the IS personnel - which should be present between two people working on a specific project - the IS end user would be able to ascertain and expect the presence of certain professional qualities (Lee, et al., 1995). The points questioned are those in relation to the IS personnel's pursuit of training and education in order to stay current in the field. The second issue deals with an attitude of seeking opportunities and being aggressive in order to develop new and better skills for career advancement. The final issue is the initiative to participate in professional societies that support learning and currency in new and changing technology (Green, 1989; Silver, et al., 1995). The ability and desire of the IS personnel to maintain currency in new technology and improve skills and knowledge for existing technology is an expectation that IS end users have (Lee, et al., 1995). It should also be a concern for IS personnel. This is a very important tool for IS personnel to use

to achieve personal goals such as promotion and advancement in their career field and is also an efficiency expectation of management.

Satisfaction Construct. Constructs for user satisfaction have been used extensively in prior research. Baroudi and Orlikowski (1988) were the originators of the user information satisfaction (UIS) construct. The current UIS instrument contains thirteen questions. This version of the UIS was further analyzed by Doll, Raghunathan, Lim, and Gupta (1995) and found to be composed of three factors: (1) IS personnel relationship, (2) information product, and (3) knowledge and involvement. The UIS instrument has also been used as a surrogate for measuring system success (Saarinen, 1996, and Linberg, 1999).

Metrics

Performance Construct. As mentioned previously, respondents were asked to rate the importance of the performance constructs on a scale of 1 to 5 with 1 equal to not important to 5 equal to very important. To confirm the fit of the different questions to their corresponding category a Confirmatory Factor Analysis (CFA) was performed using the 214 responses gathered in this research project. One of the important advantages offered by CFA is the opportunity to examine the reliability and validity of the construct once it has been established by prior research or analysis. The specific confirmatory factor analysis (CFA) conducted utilized the Covariance Analysis of Linear Structural Equations (CALIS) found in the SAS program package. Fit indices are reported in CALIS to identify goodness of fit, including 1) Adjusted Goodness of Fit Index (AGFI); Root Mean Square Residual (RMR); the Bentler's Comparative Fit Index (CFI); Bolen's Non-Normed Fit Index (NNFI), and Chi-Square value/degree of freedom (Bentler, 1989;

Bollen 1989). The results of the CFA (Table 3) indicated a good fit for the seven constructs between model and data (AGFI=.81, RMR=.04, Chi-Square/D.F.= 1.70, CFI=.91, and NNFI= .90). These exceed the recommended fit requirements (Bollen, 1989; Kettinger and Lee, 1994).

Convergent validity is demonstrated by the use of different instruments to measure the same construct if the scores of the multiple tests are highly correlated. If all factor loadings for the indicators measuring the same construct are statistically significant (more than twice their standard errors) and the T-values are significant, the evidence supports the convergent validity of those indicators (Anderson and Gerbing, 1988). Table 3 shows this to be true. The homogeneity of each of the items was further established by computing its internal consistency coefficient (alpha) using the formula as recommended by Cronbach (1951). The seven alphas ranging from .68 to .84 are shown in Table 3.

Discriminant validity can be empirically demonstrated by a confidence interval test (Anderson and Gerbing, 1988). The confidence interval test involves calculating an interval of plus or minus two standard errors around the correlation between factors and then analyzing the results to see if the interval included 1.0, or −1.0. If the interval for each construct does not include 1.0 or −1.0, discriminate validity is demonstrated. These results can be seen in Table 4. No interval contains the value 1, therefore, discriminant validity is demonstrated.

User Information Satisfaction Construct. Table 5 displays the results of the CFA for the UIS instrument. It is broken down into the three sub-components, and the decision variables indicate a good fit between model and data (with AGFI = .76, RMR =

Table 3: Properties of the CFA of IS Personnel Performance

Construct Indicators	Standardized Loadings	T-value	Cronbach Alpha
Quality			.68
Q1	.49	6.58*	
Q2	.63	8.89*	
Q3	.66	9.45*	
Q4	.54	7.48*	
Project Work			
P1	.56	8.20*	.83
P2	.62	9.35*	
P3	.82	13.46*	
P4	.75	11.88*	
P5	.76	12.15*	
General Task			.71
G1	.69	10.48*	
G2	.62	9.26*	
G3	.26	3.51*	
G4	.67	10.28*	
G5	.64	9.59*	
Personal Quality /Interpersonal Skills			.84
I1	.77	12.43*	
I2	.79	13.01*	
I3	.85	14.31*	
Dependability			.83
D1	.80	13.03*	
D2	.75	11.97*	
D3	.79	12.93*	
Teamwork & Leadership			.78
T1	.73	11.17*	
T2	.77	11.90*	
T3	.70	10.57*	
Career-Related Activity			.78
C1	.70	10.41*	
C2	.85	13.29*	
C3	.66	9.65*	

Note: 1) * indicates significant at $p < .05$ level.
2) AGFI = .81; RMR = .04; Chi-Square/D.F. = 472.99/278= 1.70; CFI = .91; NNFI = .90

Table 4. Discriminant Validity Test For IS Personnel Performance

Dimension	Estimate	Standard Error	Lower Boundary	Higher Boundary
Quality - Project Work	.64	.06	.52	.76
Quality – General Task	.59	.07	.45	.73
Quality - Interpersonal	.55	.07	.41	.69
Quality – Dependability	.66	.06	.54	.78
Quality – Teamwork	.65	.07	.51	.79
Quality – Career Activity	.69	.06	.57	.81
Project Work – General Task	.72	.05	.62	.82
Project Work – Interpersonal	.62	.06	.50	.84
Project Work – Dependability	.59	.06	.47	.71
Project Work – Team Work	.62	.06	.50	.74
Project Work – Career Activity	.46	.07	.32	.60
General Task – Interpersonal	.79	.05	.69	.89
General Task – Dependability	.85	.04	.78	.93
General Task – Team Work	.57	.07	.43	.71
General Task – Career Activity	.43	.08	.27	.59
Interpersonal – Dependability	.74	.05	.64	.84
Interpersonal – Teamwork	.63	.06	.51	.75
Interpersonal – Career Activity	.44	.07	.30	.58
Dependability – Team Work	.64	.06	.52	.76
Dependability – Career Activity	.52	.07	.38	.66
Team Work – Career Activity	.59	.07	.45	.73

Note: The range between lower boundary and higher boundary does not contain the value 1.0 – indicating the discriminant validity between the constructs.

Table 5. Properties of the CFA for UIS

Construct Indicators	Standardized Loadings	T-value	Cronbach Alpha
Knowledge & Involvement			.77
S2	.75	8.45*	
S3	.52	5.41*	
S4	.46	4.77	
S5	.68	7.52*	
S12	.62	6.62*	
IS Personnel Relationship			.80
S1	.65	7.18*	
S6	.85	10.45*	
S11	.80	9.54*	
Information Product			.82
S7	.84	11.38*	
S8	.70	8.09*	
S9	.56	6.02	
S10	.72	8.32*	
S13	.76	8.94*	

Note: 1) * indicates significant at $p < .05$ level.
2) AGFI = .76; RMR = .06; Chi-Square/D.F. = 139.19/62= 2.24; CFI = .88; NNFI = .85

.06, CFI .88, Chi-Square/DF=2.24, NNFI = .85). In addition, the significance of all parameter estimates (e.g., t-value > 3.0) indicates that the constructs demonstrate acceptable convergent validity. The confidence interval test (Table 6) does not include 1.0 (or -1.0); hence, each scale seems to capture a construct that is significantly unique from the other constructs, demonstrating discriminant validity.

The homogeneity of each of the remaining items was further established by computing its internal consistency reliability coefficient (alpha) using the formula as recommended by Cronbach (1951). The three alphas range from .77 to .82 and are

Table 6. Discriminant Validity Test For UIS – Confidence Interval Test

Dimension	Estimate	Standard Error	Lower Boundary	Higher Boundary
IS Personnel Relationship - Involvement	.84	.05	.74	.94
IS Personnel Relationship - Info. Product	.72	.06	.60	.84
Info. Product -Involvement	.74	.07	.60	.88

Note: The range between lower boundary and higher boundary does not contain the value 1.0 – indicating the discriminant validity between the constructs.

shown in Table 5. Convergent validity is supported by all factor loadings being statistically significant (more than twice their standard errors).

Statistical Testing Methods for Discrepancies. Headley and Choi (1992) explain the mechanics of gap analysis. They find that the major difficulty in examining or measuring the gap is the accuracy of the measure of two different perspectives on the same issue. This particular research formulates methods for the accurate measurement of this intangible from two different stakeholders. Headley and Choi's main focus is thedevelopment of a premise that has immediate managerial value and that would have the potential to serve as a catapult for future development of the concept. They recommend seven steps to accomplish an easily repeatable gap analysis. Those steps are

1) Identify critical areas of service that are meaningful to management.

2) Phrase statements in the survey so that respondents can agree or disagree on a numerical scale. This will facilitate more accurate statistical analysis later.

3) Administer the surveys to both employees and customers by mail, telephone, or in person. You must gather at least one hundred surveys for sound statistical outcome.

4) Edit, code, and process the raw data once the surveys are returned.

5) Obtain a t-test for the significance of each statement for each group. Compare the two primary groups for differences.

6) Evaluate the findings within the framework of the specific setting that was tested.

7) Repeat the process periodically for monitoring purposes.

This model is followed in this research to help assure the validity of the analysis results. The statistical analysis is more vigorous than that recommended by Headley and Choi. To test the hypothesis as it pertains to "have and want" discrepancies, an ANOVA model of positive and negative discrepancies is employed to examine differences in the mean satisfaction expressed by each group based on the gap of overall performance satisfaction.

The ANOVA analysis demonstrates "additive" discrepancy effects associated with the standard of comparison (i.e., want). First, a single gap measure is computed as the average of the gaps for all seven dimensions of performance satisfaction. The categories in the ANOVA are then determined according to whether the gap is positive or negative. The dependent variable is IS end user satisfaction for testing the hypothesis regarding the IS end users. Based on discrepancy theory, one would predict the ANOVA model is significant and the means for the positive gaps will be lower than for the negative gaps. A higher "want" amount would indicate less satisfaction and higher "have" amounts would indicate more satisfaction or the existence of a higher state of satisfaction for the user.

Results

In Table 7 the results of two paired t-tests that were conducted to establish the differences between expectations and perceived results of performance for the two stakeholders (IS end user and IS personnel). The significant t-tests are marked with an asterisk. These t-tests are matching IS end user expectations to IS personnel expectations and the results show that each stakeholder started with differing expectations on the importance of each segment of the performance construct. Likewise, differing perceptions of outcome on the performance construct segments for the two stakeholders exist. This supports H1 and H2, which states that a difference in perception exists between users and IS professionals in expectation and perceived delivery.

Table 7. Data Analysis Results for H1 and H2: IS Personnel Job Performance

	IS End Users	IS Personnel	T-value
Expectations (Want)			
Mean	4.12	4.35	3.69*
Std.	.48	.41	
Median	4.17	4.34	
Skewness	-1.65	.44	
Kurtosis	4.41	4.86	
Satisfaction (Have)			
Mean	4.02	4.23	2.27*
Std.	.76	.53	
Median	4.14	4.28	
Skewness	-.76	-1.16	
Kurtosis	.19	1.53	

Note: * indicates significant at p-value < .05 level.

Table 8 presents the descriptive values of the user satisfaction measures. The analysis reported in Table 9 uses the UIS section of the IS end user instrument to demonstrate the accomplishment or non-accomplishment of desired outcomes for these

stakeholders. In Table 9, the "haves" and "wants" are a single measure of the scales from the confirmatory factor analysis. This analysis shows that the overall UIS measure is related to the independent "wants" and "haves". The expected direction, as predicted by discrepancy theory, is negative for "want" and positive for "have." The IS end user is not satisfied with the IS personnel's deliverance of performance. Thus, H3 is supported, indicating that a discrepancy is negatively related to satisfaction.

Table 8. User Satisfaction

	(Overall UIS) User Satisfaction	UIS IS Staff Relationship	UIS Information Product	UIS Knowledge Involvement
Mean	3.76	4.07	3.67	3.47
Std	.70	.79	.77	.74
Median	3.86	4.17	3.75	3.45
Skewness	-.45	-.90	-.15	-.39
Kurtosis	-.32	.39	-.50	.05

Table 9. ANOVA Analysis for H3 and H4

	Expectations (Want) > Satisfaction (Have)	Expectations (Want) < Satisfaction (Have)	P-value
User Satisfaction (IS End Users)	3.39 (n = 47)	4.17 (n = 43)	.01*

Note: * indicates significant at p-value < .05 level.

Conclusions and Implications

The results of the testing of the data support the hypotheses very well. The paired t-tests clearly point out the perceptional differences expected to exist between IS

personnel and IS end users (H1 and H2). They also delineate the difference between each group's expectations and their perceived end product. The data was collected from a wide range of companies and institutions in several different regions of the United States. All of the validity tests performed are positive in nature. They confirm the absence of population bias and the clear delineation between the constructs that are used. The CFA's were used to reconfirm the validity of the questionnaires that were used. They reinforce what past research has already established.

When looking at expectation levels for both stakeholders (Table 10) it is very obvious that the two stakeholders started out with different expectations for the upcoming work or project. On the seven segments of the performance construct the means for each segment are different for IS end users and IS personnel. By accepting hypotheses H1 and H2 we find this research compatible with the background theory. Past research in organizational behavior and social perception theories predicted that differences would exist between individual expectations and perceived outcomes. The differences between expectations and outcomes predicts differences between groups. Ross and Fletcher (1985), supported by Schiffmann (1990), help explain this cognitive process of studying and storing perceived facts about people and situations and how they draw on that information at later times to help them understand their present surroundings and situations. The situations and past experiences tend to be very individualized to the person who has stored that information; thus, each person perceives differently as a result of his or her past experiences. The descriptive statistics for Job Performance Satisfaction in Table 11 also point out differences in the satisfaction levels of both stakeholders.

Improving user satisfaction has been the subject of prior research. Baroudi et al. (1986), supported later by Baron and Byrne (1991), explored the realm of user involvement and how it leads to system usage and satisfaction. User involvement should also lead to a narrowing of the differences between user and IS personnel expectations through increased communications (Ginzberg, 1981). This would provide a better anchor point in any discrepancy model. Hawk and Dos Santos (1991), along with Cowan, Gray, and Larson (1992), and Miller (1993), express the need for end user participation in design and analysis in order to gather more accurate information. This type of process will help provide revitalization in the organization when linked with other efforts to improve quality, timeliness, and customer satisfaction. It would also lead to a better understanding of performance and perhaps serve to close existing discrepancies.

In Table 9, the ANOVA analysis for discrepancy theory is performed to confirm a gap effect between satisfaction levels and perceived performance delivery. This model shows that the UIS is related to an overall measure of IS performance in terms of "haves" and "wants". The "haves" and "wants" are a single measure of the seven performance scales in the performance construct after the CFA analysis. The measure exhibits the expected lack of agreement or gap effect between IS end user expectations and perceived outcomes. Table 9 shows that IS end users are not satisfied. The IS end user is not satisfied with the level of performance provided by the IS personnel as shown in Tables 8 and 11.

The setting of common goals should prove effective for clarifying the expectations among stakeholders (Cowan et al., 1992). Creating a common set of metrics between the two stakeholders facilitates an understanding of common goals. Locke and

Table 10. Expectations

A. IS End User Want:

	IS Personnel Performance (Overall)	Quality	Project Work	General Task	Personal Quality/ Interpersonal	Dependability	Team Work & Leadership	Career Related Activity
Mean	4.06	4.38	3.91	4.27	4.36	4.27	3.84	3.77
Std	.63	.61	.81	.79	.67	.74	.75	.77

B. IS Staff Want:

	IS Personnel Performance (Overall)	Quality	Project Work	General Task	Personal Quality/ Interpersonal	Dependability	Team Work & Leadership	Career Related Activity
Mean	4.38	4.60	4.13	4.27	4.58	4.56	4.24	4.29
Std	.40	.50	.69	.55	.63	.50	.60	.75

Table 11. Perceived Outcomes

A. IS End User Have:

	IS Personnel Performance (Overall)	Quality	Project Work	General Task	Personal Quality/ Interpersonal	Dependability	Team Work & Leadership	Career Related Activity
Mean	4.12	4.15	4.03	4.09	4.13	4.27	4.09	3.78
Std	.91	.87	.83	.79	.86	.91	.97	1.04

B. IS Staff Have:

	IS Personnel Performance (Overall)	Quality	Project Work	General Task	Personal Quality/ Interpersonal	Dependability	Team Work & Leadership	Career Related Activity
Mean	4.30	4.42	4.08	4.17	4.40	4.57	4.27	3.88
Std	.82	.74	.86	.66	.65	.63	.86	1.05

Latham's (1990) goal setting model shows how goals serve as motivational devices that compare a person's present capacity to that capacity required to succeed in reaching a specific goal (outcome). For goal setting theory to be viable, consonance or harmony needs to exist between the stakeholders in order to develop goals that are achievable with clearly stated outcomes that will enhance the stakeholders commitment to the IS project. According to goal setting theory, people will perform at their best when they accept expectations as their own goals. An example would be when IS personnel accept IS end users expectations about what the new system should be. If IS personnel accept, or at least know, the goals of the users, then they can target performance to those levels, further closing any discrepancy and improving satisfaction.

Future Research

As researchers continue their quest to define success in IS projects, there are many ways to improve upon this segment. This research is very general in nature, and further refining in specific areas could improve the analyses. This study is compatible with the 360 degree evaluation process. The consonance process includes multiple stakeholders and produces constructive feedback for the various participants. Consonance is designed to improve harmony among the stakeholders and assist in setting goals that are understood by all participants. These goals should be in alignment with organizational goals. In order for consonance process to gather pertinent information the two stakeholders, IS end users and IS personnel, must have had previous contact on a project in order to evaluate the performance skill areas.

This study is compatible with the 360 degree evaluation process. The consonance process includes multiple stakeholders and produces constructive feedback for the

various participants. Consonance is designed to improve harmony among the stakeholders and assist in setting goals that are understood by all participants. These goals should be in alignment with organizational goals. Better communication of goals and accomplishments between IS end users and IS personnel should increase the overall efficiency and effectiveness of the organization.

In future studies, it would be beneficial to examine reaction to discrepancies between self perception and user feedback. Ideally, one would want IS Personnel performance to rise rather than to have their self-image lowered to meet the IS end user evaluation.

Limitations

There are limitations to this study. The sample size was small but adequate. Additional samples with larger numbers need to be utilized to strengthen the reliability of this instrument. The sample for this research is very diverse and does not focus on any specific industry or organization type; thus, it needs refining. The instrument and process should be confined to specific areas such as, technical support, system analysis, and software engineering, for comparison of results. Each of these areas may be unique enough to require some specific changes of the process to enhance its predictive and enabling powers to guide an IS system to success. This process should also be reexamined in those companies that have complied with the use and suggestions made from this study to appraise any improvements or lack of improvements made in the organization. The current research mentioned the need of management input and guidance and that area needs to be formulated and incorporated into the consonance process suggested in this research.

CHAPTER 3

CONSONANCE APPROACH TO INFORMATION SYSTEM SUCCESS

Introduction

Consonance exists when there is harmony and understanding between stakeholders within the desired environment, thereby facilitating the promotion of cooperation and understanding in an IS project. If this type of optimum environment is present at the beginning or refinement stage of an information system, it will be much simpler to guide the stakeholders toward a common goal or outcome that is satisfactory to those involved. When people work closely together and communicate their perceptions and desires at the beginning of a new project, project and organizational goals can be better aligned. When goal alignments are successful, the probability of project success will improve, in turn improving organizational efficiency and effectiveness (Ginzberg, 1981; Linberg, 1999; Klein et al., 2001).

The last chapter discussed how the performance construct designed by Jiang et al. (2000) and discrepancy theory (Locke, 1976) identify the differences in the expectations and perceived outcomes of the various stakeholders. This chapter discusses a gap between IS personnel and IS end user perceptions and then discusses the various ways to

help bring consonance to the organization in order to lower or eliminate the differences in this gap between stakeholder perceptions. One must rely on some theoretical building blocks to accomplish a state of consonance.

The first building block is an understanding of social perception theory, so that we may understand the differences that occur in human thought processes and why those differences occur. To help promote this understanding, a cognitive process is used that compares learned knowledge and past experiences to current circumstances. An individual's knowledge and past experiences, stored in the brain, are used as a filter through which current activities are processed. The person then uses the resulting information to develop an understanding of current data, make decisions, and develop perceptions. This personal schema is different for every person; thus, perceptions of current events are not likely to be the same for any two people unless there has been some procedure or process implemented to guide them to a common perception or conclusion (Ross and Fletcher, 1985; Ainley et al., 1986; Baron and Byrne, 1991). That process can be consonance.

Another building block for creating consonance is the ability to set goals that are congruent with the stakeholder's needs and desires and the ability to maintain focus on the organizational needs and desires. Maintaining agreement between stakeholders is generally an important ingredient in the achievement of a successful outcome for all concerned (George and Jones, 1999). If the affected stakeholders are not in agreement about outcome, conflicting goals can be pursued--resulting in outcomes that are not satisfactory to all stakeholders. The differences in the perspectives of IS end users and IS personnel make it difficult to maintain a commonality in these two groups (Adelman,

1992). When specific goals are not defined for a project and organizational goals are not widely understood or accepted, people tend to pursue their own interests, which are not always in the best interest of the organization. This lack of goal direction often causes the two stakeholders to make inconsistent decisions (Abdel-Hamid, 1999). Agency theory also does a good job of explaining these types of problems by supporting the premise that individuals tend to pursue their own interests if management does not clearly define the organization's goals. Eisenhardt (1989) defines these problems in the context of supplier (IS personnel) and buyer (IS end user) and gives some insight on how to resolve the goal outcomes of the two parties. Congruence and goal setting theories play an important role in the understanding of agency theory.

The ability to become aware of perceptional problems between stakeholders through the use of discrepancy theory, and the use of a performance construct that both stakeholders can understand and respond to, opens the way for creating a system that promotes understanding between stakeholders. Consonance can be achieved through a better understanding of each person's thought processes and better communication paths. The use of more elaborate evaluation systems, such as 360 degree evaluations, also improves the understanding of other's perceptions and creates better communication between stakeholders. Consonance is compatibility among all stakeholder interests in an organization. This in turn improves the stakeholder's ability to focus on organizational goals.

Literature Review

Webster's dictionary defines consonance as "harmony or agreement among components." It is viewed in this research as a theory-supported process used to improve

the success rate of IS projects (Klein et al., 2000). The major components of IS creation are the numerous stakeholders that are involved. The most prominent of those stakeholders would include IS personnel, IS end users, and management. The critical issue involved in reaching IS success is the formulation of goals, measures, and projected outcomes that are acceptable to all parties involved. This allows management to direct development and provides feedback for future endeavors. The concerns of this research revolve around the actions and reactions of people, the ability to set initial goals that are satisfactory to all, and making sure people are working toward organizational goals and not self-serving goals.

Human behavior is unique to each individual. The study of behavior has shown how environment, knowledge, and past experience cause each individual to react differently (Baron and Byrne, 1991; Saal and Knight; 1988). When dealing with individuals and groups, this knowledge must be considered in order to understand the different perceptions that occur and the different interactions that occur between people. This study attempts to determine the perceptions and resulting actions of two different stakeholder groups – IS personnel and IS end users. Once each individual's expectations and perceived outcomes are understood, the task of developing the consonance process is less difficult. Management would have the ability to direct goal setting when supplied with information gathered about the stakeholder's beginning expectations and past experiences. Goal setting directives can be incorporated with other remedies, such as 360 degree evaluation (Serven, 1996), to assist the stakeholders in maintaining congruence for the task being performed. Past literature in goal setting and agency theory has shown us it is imperative for all stakeholders to seek a common goal in order to be successful

(Huarng, 1995; Brown, Cron, and Slocum, 1998). Commonly held goals among stakeholders will reduce agency theory problems.

The study of social perception is very important to understanding the cognitive process. Individuals' perceptions of past events are stored and then used in this cognitive process to help understand present surroundings and situations. This process is unique to each individual because all people have different events stored from the past (Ross and Fletcher, 1985; Baron and Byrne, 1991; Schiffmann, 1990). Multiple group perceptions of the same target will also differ in content and importance because of differing past experience (Adelman et al., 1985; Baron and Byrne, 1991). Many researchers support the idea of joint participation in IS projects and document the improvement in relationships and problem resolution as well as overall improved efficiency for a project and for the organization (Markus and Bjorn-Anderson, 1986; Hawk and Dos Santos, 1991; Miller, 1993). This improvement is based in goal setting and congruency theory. The ideal working situation is for both IS end users and IS personnel to be present at the planning stages of new IS. With representation of all viewpoints at meetings between the two stakeholders, it is possible to discuss pertinent issues from all concerned and receive input from all sources. This highly improves the communication process and allows a melding of needs and wants to allow all parties involved a better opportunity to express their own wishes and better understand the views of other stakeholders. Acceptance by all stakeholders of goals and plans made under these conditions is much higher when all participate and can claim ownership in those goals and plans.

Ginzberg expanded the body of knowledge regarding early IS end user expectations for a new IS project. His research placed emphasis on goals and objectives,

importance of the problem being resolved by the new IS, how the system will be used, how it is expected to impact the organization, and what criteria will be used to evaluate the system. These issues make it even more imperative to include the IS end user in the design and planning stages of a new project. There are clearly different emphases on goals and objectives set forth by all the stakeholder groups. As a rule, management personnel are more attuned to objective measures – time and money. IS end users tend to be more aligned with effectiveness and ease of use, and IS personnel are more interested in the technical aspects of the software and its reliability. Achieving "wants" compatibility is crucial to higher levels of success. Ginzberg is steadfast about stakeholders beginning expectations being a predictor of system failure or success.

An organization needs to be focused on the same goals to maintain efficiency and satisfaction among its members. Social perception theory illustrates the differences between IS personnel and IS end users. Measures need to be developed to statistically delineate these differences between stakeholders (Kaiser and Srinivasan, 1982; Green, 1989). Once these differences are exposed, management techniques can be formulated to create consonance between the stakeholders. These differences have been identified in prior research (see Figure 2) (Jiang et al., 2000; Abdel-Hamid, 1999). The process of consonance will enhance the process of organizational change caused by the transition to new technology and will also improve the ability of the stakeholders to stay focused on like goals.

A more desirable situation is represented when the three parties - IS end users, IS personnel, and Management - have come to a prior agreement on measuring system success and the target levels for the metrics. Agreement at the start of system

development can ensure the project moves toward the mutually understood goals and objectives. Agreement, in a multi-stakeholder environment, has been proposed in past works on multi-source feedback (London and Smither, 1995). Multi-source feedback systems require the use of metrics that are understood by all parties. Once the metrics are agreed upon a timetable for issuance can be determined and conflicts or variances can be resolved when discovered.

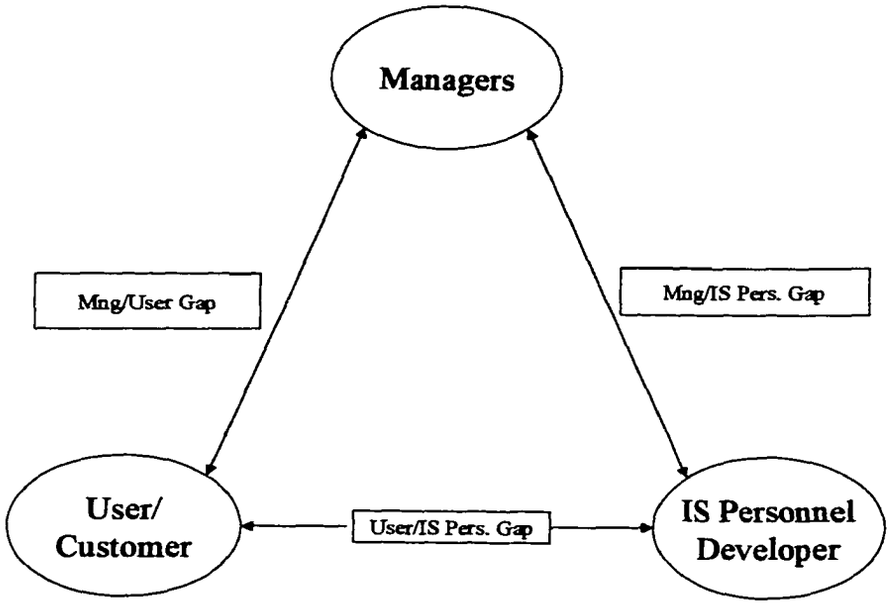

Figure 2. Stakeholder Views of Two Criteria

It is also important to understand that satisfaction and personal perceptions are linked to outcomes. This is shown in a study performed by Bartol (1983) linking satisfaction to an outcome (employee turnover) of an IS project and also by Davis (1989) who links IS end user perceptions of usefulness and ease of use to specific outcomes. The operationalization of satisfaction was accomplished with the User Information Satisfaction (UIS) instrument. The UIS is widely used in current research for end users

(Porter et al., 1976; Bailey and Pearson, 1983; Ives et al., 1983). Saarinen (1996) finds user satisfaction to be a surrogate for system success. Franz and Robey (1984) point out the significance of a managed relationship that guides both stakeholders toward a common goal that could increase the chances of the successful development of information systems.

In the area of perceptions related to outcome, researchers have expressed a need for new subjective measurements. A performance based construct has been created by Jiang et al. (2000) that allows both IS end users and IS personnel to rank the importance of seven performance issues used in creating new IS. That performance construct is used in this research.

Upper management is responsible for aligning goals among the stakeholders involved in developing IS (Huarng, 1995). Other researchers emphasize that congruence is important, and that through guided competition, congruence will increase production and innovation (Bozarth and Berry, 1997; Brown et al., 1998). Once agreement is achieved, at the beginning of the system development, a process can exist to ensure that the project moves toward the mutually understood objectives. Maintaining consonance within the organization then becomes a task for management to address. Thus, goal congruency requires the sharing of a common view of the system objectives, while social perception indicates that goal congruence is an unlikely occurrence without intervention.

Building and attaining consonance within the organization can promote higher efficiency and productivity. Consonance requires that the various stakeholders share an understanding of common goals while providing a vehicle for the resolution of any conflict in those goals. Consonance is a composite of many factors that encompass

relevant success criteria, uses many dimensions of success, and should be used during the planning stages of new IS. Alignment of stakeholder perceptions of the importance of issues and desired outcomes should be required before starting the process of setting project goals. This allows management to set the stage for success in the beginning rather than looking for the cause of failure after the project or service has been delivered.

There are three hypotheses tested in this research. H1 and H2 are designed to show that differences do exist between the two stakeholders, IS personnel and IS end users. H3 shows that these differences cause problems between the stakeholders.

Social perception theory has been applied to IS end users and IS personnel in numerous research endeavors. It is important to remember that all people think and act differently, based on their own personal schemas that are developed over a lifetime. Therefore, it would be normal to expect different expectations from the two stakeholders involved in this research. The first hypothesis is:

H1: There is a difference between IS end users and IS personnel ratings on the importance of each of the IS job performance measures.

Hypothesis H1 predicts a difference between stakeholders. Hypothesis H2 moves a step further in demonstrating that the IS personnel have perceptions about how they think the IS end user will respond to the importance issues in the performance construct. Social perception theory is also a strong basis for this hypothesis. The different background of the individual and the basic differences that are generally present in work situations help explain the lack of agreement between the stakeholders perceptions of importance. If there is agreement, congruence does exist and there is no need to establish consonance. If there is disagreement, it further corroborates our assumption that the stakeholders are not in agreement on goal motivation and probably do not perceive the

same outcome. This further demonstrates that the IS personnel do not understand what the IS end user really wants from the project.

H2: The IS personnel prediction of IS end user ratings for importance of performance measures is different than the actual IS end user ratings.

If both H1 and H2 prove to be correct, they will be very good predictors of IS project failure. This assumption is based on previous material covering goal theory and agency theory. Ginzberg (1981) was very emphatic about expectation alignment at the beginning of the creation of new IS and its importance as a predictor of IS success. His concern stemmed from economic losses and lost potential due to high failure rates in new IS. Likewise, Huarng (1995) and Brown et al. (1998), in their research on goal setting and agency theory, found it imperative for all stakeholders to seek a common goal in order to be successful. Therefore, we test the following hypothesis:

H3: The lower the gap between IS personnel expectation and IS end user expectation the higher the level of IS end user satisfaction.

Methodology

Data Collection

The sample of ninety three pairs of users and IS professionals was taken from several geographic areas including Texas, Arkansas, Colorado, Kansas, Oklahoma, and Missouri. IS professionals are defined as those responsible for working with IS end users to gather and analyze information about current and future information systems for the organization (Misic, 1996). They are also responsible for gathering information from the IS end users, solving problems, making system improvement proposals, training the IS end user, and the delivering and setting up of finished system products. The IS end users in this study include anyone in the organization who had need of IS support. This

includes all levels of management, professionals, staff members, and in some cases, other IS personnel. Anyone who has a need to use information systems in their daily routine is considered an IS end user. The IS end user should also play the role of "participant" in the analysis of needs and design of the systems.

For purposes of this research, the IS end users and IS personnel participants had to be working together on a specific project or extensive job task. Contact was generally made with upper level management representative who then discussed the research with the IRD management person. The importance of matched pairs was reemphasized, and the requirement that each of these pairs had worked together in the recent past on a specific project or extensive job task was reiterated. Survey distribution was conducted on a personal contact basis by the researcher or authorized agents. Complete confidentiality was maintained for all participants. The only requirement was the use of some identification mark (task or project used as the basis for the answers presented in the questionnaire) to identify the company and the projects within the company in terms of pair alignment. Company officials and/or supervisory personnel were not allowed to see the completed instruments.

A total of 229 questionnaires were returned to the researcher, and 214 of those returned were complete. Out of the 214 completed, there were 93 mutually exclusive pairs. There were 93 IS personnel questionnaires and 121 IS end user questionnaires. Several of the IS personnel questionnaires were matched with more than one IS end user; therefore, one of the multiple matched IS end user forms was chosen randomly to pair with the IS personnel questionnaire and the remainder were discarded.

Certain demographics were requested on IS end users and IS personnel questionnaires, and this information is reflected in Table 1. The data shows number of male and female respondents in each group, along with average age and the age range. For IS personnel, there are four general job descriptions and the total in each of these identified areas. Also reflected is the average number and range of years that the IS personnel have spent in user support area. The last statistic gathered on IS personnel relates to their job assignment. It identifies the number of respondents assigned to the IS department, the number of respondents assigned to other operations departments, and those individuals who are generally assigned to the IS department but who are on loan to another operations department.

Constructs

The current research develops the idea of consonance between IS end users and IS personnel as a tool to improve information system success. To accomplish this link, a performance construct for IS personnel is used in conjunction with a satisfaction construct for IS end users. The IS personnel performance construct was first introduced by Jiang et al. (2000). The performance construct consists of seven segments that are used as a basis for this study. The satisfaction construct is the UIS instrument developed by Baroudi and Orlikowski (1988) and is used to measure IS end user satisfaction.

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The IS end users in this study include anyone in the organization who had need of IS support. This includes all levels of management, professionals, staff members, and in some cases, other IS personnel. Anyone who has a need to use information systems in their daily routine is considered an IS end user. The IS end user should also play the role of "participant" in the analysis of needs and design of the systems.

Performance Construct. Jiang et al. (2000) used the performance construct in an earlier study (see Table 2 for more detail). That study looks for three essential qualities in the performance constructs. First, the measures must represent many aspects of the process development; secondly, the measures must be recognized and validated in prior research; and thirdly, the measures must be recognized and understood by both IS professionals and IS end users.

There are seven different segments within the performance construct. The first one deals with overall quality of implementation, use of tools and procedures, and overall pursuit of effectiveness in the process of creating IS (DeLone and McLean, 1992; Zahedi, 1995; Saarinen, 1996). Technical quality of the system is omitted due to the inability of IS end users to properly judge this factor.

The second segment defines procedures in the project work area. The procedures involve accurate time schedules, planning, defining objectives, and the delivery of timely reports (Jones and Harrison, 1996; Saarinen, 1996). The third area looks at issues listed under general tasks and that includes factors such as anticipating IS end user needs, persistence in problem solving, and keeping IS end users informed (Sullivan-Trainor, 1988; Grupe and Kilari, 1994). The fourth area measures personal qualities and interpersonal skills. This area deals with listening skills, respect, and clarity of ideas

(Green, 1989; Lee et al., 1995; Silver et al., 1995). The fifth segment deals with dependability of follow up, responsiveness, problem solving, and the acceptance of new assignments (Green, 1989; Grupe and Kilari, 1994; Lee, et al., 1995).

The last two segments cover teamwork and leadership abilities and IS personnel career training. Teamwork and leadership involve such activities as coaching other IS staff members, actively contributing to a project, and leading a team toward its stated objectives (Green, 1989; Grupe and Kilari, 1994; Lee, et al., 1995). Career training involves activities geared toward currently advancing one's career (Green, 1989; Silver, et al., 1995). IS end users are presumed to be familiar with all seven of the performance segments. Specific expertise areas have been avoided, as untrained IS end users are not able to make competent decisions in those kind of areas. IS end users expect the IS personnel to be current in all of these areas (Lee, et al., 1995).

Satisfaction Construct. There are two constructs used to measure satisfaction in this research. One is incorporated in the performance construct as a final section to that segment and reflects information from both IS end users and IS personnel. This satisfaction construct is under development, along with the new performance construct previously reviewed (Jiang et al., 2000).

The UIS instrument has been in use for a long time, and its validity has been proven in numerous studies relative to measurement of IS end user satisfaction with IS programs. Bailey and Pearson (1983) were able to operationalize IS end user satisfaction with a questionnaire that was later improved by Ives et al. (1983). The questionnaire evolved into the user information satisfaction (UIS) instrument used in this research. Baroudi and Orlikowski (1988) compiled the short form version of the UIS used in this research. It

was further refined by Doll et al., (1995) to show that it included three primary factors. These factors were IS personnel relationship, information product, and knowledge and involvement. Saarinen (1996) and Linberg (1999) have also used the UIS as a surrogate for system success.

Metrics

Statistical Testing Methods for Discrepancies. Headley and Choi (1992) review the process of gap analysis. The attempt to accurately measure two different perspectives on the same issue is a daunting challenge. Their research delves into the accurate measurement of the differences or gap in these two different perspectives. They were able to formulate methods to accomplish the accurate measurement of this intangible from two different stakeholders. Headley and Choi's main focus is the development of a premise that has immediate managerial value and that would have the potential to serve as a building block for the future development of the concept. They recommend seven steps to accomplish an easily repeatable gap analysis. Those steps are

1) The identification of critical areas of service that are meaningful to management.

2) The phrasing of statements in the survey so that respondents can agree or disagree on a numerical scale. This will facilitate more accurate statistical analysis later.

3) The administration of the surveys to both employees and customers by mail, telephone, or in person. At least one hundred surveys must be gathered for sound statistical outcome.

4) The editing, coding, and processing of the raw data once the surveys are returned.

5) The obtaining of a t-test for the significance of each statement for each group. Compare between the two primary groups for differences.

6) The evaluation of the findings within the framework of the specific setting that is tested.

7) Repetition of the process periodically for monitoring purposes.

This model is followed in this research to help assure the validity of the analysis results. Identical questionnaires on IS performance were administered to both IS personnel and IS end users. The statements created are the original seven constructs that were developed in earlier research by Jiang et al. (2000). The statistical analysis is more vigorous than that recommended by Headley and Choi.

Regression analysis demonstrates gap effects associated with the standard of comparison (i.e., want). The significance of the regression analysis using the overall measure of satisfaction shows lack of satisfaction, thus, the lack of consonance between IS end users and IS personnel. The dependent variable for testing the hypothesis regarding the IS end users is IS end user satisfaction. Discrepancy theory predicts the model is significant because satisfaction is not present. These results indicate that a higher "want" amount indicates less satisfaction, and a higher "have" amount would indicate more satisfaction or the existence of a higher state of satisfaction for the user.

Results

In Table 7 the results are reflected for the paired t-test (overall construct) that was conducted to establish the differences between expectations of performance for the two stakeholders (IS end user and IS personnel). The t-test shows the difference to be significant. This t-test matches IS end user expectations to IS personnel expectations, and the results show that each stakeholder started with differing expectations on the importance for the overall segment of the performance construct. Table 12 contains the results for the paired t-tests between IS personnel perception of IS end users' importance

Table 12. Paired T-test - IS Personnel Job Performance

IS Personnel
Perception of User

Expectations	Ovrall	Qual	Prj Wk	Gen Task	Per Qual	Dep	Team/Lead	Career Act
Mean	3.93*	3.93	3.69	4.28	4.63	4.17	3.43	3.37
Std.	.53	.73	.69	.59	.52	.63	.92	.95
Skewness	-.69	-.45	-.23	-1.20	-1.43	-.41	-.42	-.50
Kurtosis	3.70	2.73	2.43	4.37	4.43	2.82	2.82	2.82
t-value	2.37*	-3.98*	-2.44*	.65	2.99*	-.73	3.42*	3.42*

Table 13. Consonance H3

Gap Score Correlation to UIS
Regression to UIS (Overall regressed separately)

Expectations	Ovrall	Qual	Prj Wk	Gen Task	Per Qual	Dep	Team/Lead	Career Act
Mean	.49	.51	.87	.72	.60	.67	.72	.83
Correlation.	-.37*	-.24*	-.00	-.13	-.45*	-.46*	-.24*	-.39*
Regression	-.59*	-.09	.07	.04	-.34*	-.29*	.11	-.34*

(* Significant at .05)

rating for the performance construct and the IS end users actual rating for the importance of the performance construct. The results show that each stakeholder has different perceptions and the overall t-test show that the two stakeholder perceptions are different.

The analysis reported in Table 13 uses data from the UIS section of the IS end user instrument and the performance construct to demonstrate the misalignment of perceptions between the primary stakeholders (IS end user and IS personnel). The misalignment of perceptions is shown two ways – through correlation analysis and two regression analyses to show gap effect. The dependent variable in the regression analyses is a single measure of the UIS instrument. The independent variable in the regression analysis is the absolute gap for each of the performance measures. The performance construct variables are also correlated against the UIS. All of the correlation data point in the expected direction, and all but two are significant. The first regression uses all of the performance variables except the overall variable, and all of the significant coefficients point in the expected direction. The regression result for the overall score is in the expected direction and is significant. Thus H3 is accepted. There is a gap effect in expectations. The negative for "want", as predicted by discrepancy theory, indicates the IS personnel do not understand IS end user expectations.

Conclusions and Implications

The results of the data testing support the hypotheses very well. The paired t-test for expectations clearly point out the perceptional differences expected to exist between IS personnel and IS end users (H1) (Table 7). The paired t-test for IS personnel perception of IS end user expectation compared to the actual IS end user expectation

clearly points out the lack of understanding that the IS personnel have for the IS end users (H2) (Table 12). The data was collected from a wide range of companies and institutions in several different regions of the United States. The instruments used have been confirmed and validated in previous research (Jiang et al., 2000; see Chapter 2).

When looking at expectation levels for both stakeholders (Table 10) it is very obvious that the two stakeholders started out with different expectations about the upcoming work or project. On the seven segments of the performance construct, the means for each segment are different for IS end users and IS personnel. It is also obvious that the IS personnel do not understand the wants of the IS end users. Accepting hypotheses H1 and H2 leads to the conclusion that this research is compatible with the background theory. Past research in organizational behavior and social perception theories predicts that the differences will exist between individual expectations and perceived outcomes, and these differences in expectations also predict differences between groups. Ross and Fletcher (1985), supported by Schiffmann's work (1990), help explain this cognitive process of studying and storing perceived facts about people and situations and how people draw on that information in later times to help them understand their present surroundings and situations. The situations and past experiences tend to be very individualized to the person who has stored that information; thus, each person perceives differently as a result of his or her past experiences.

Improving user satisfaction has been the subject of prior research. Baroudi et al. (1986), supported later by Baron and Byrne (1991), explore the realm of user involvement and how it leads to system usage and satisfaction. User involvement should

also lead to a narrowing of the differences between user and IS personnel expectations through increased communications (Ginzberg, 1981).

In Table 13, the correlation analysis and regression analysis is performed to confirm a gap effect between satisfaction levels and perceived performance expectation in both stakeholder groups. This model shows that the UIS is related to an overall measure of IS performance in terms of expectations. The expectations are a measure of the seven performance scales in the performance construct. The measure exhibits the expected lack of agreement or gap effect between IS end user expectations and IS professional expectations. The correlations are all in the expected direction, negative, and all but two are significant. Likewise, in the regression analysis, all seven performance variables are significant and in the expected direction. The overall variable was regressed against the UIS; it is significant, and H3 is accepted. There is a gap effect between the stakeholders, and there is no congruence or understanding between the groups.

Consonance requires an effort to understand a set of common goals created by the various stakeholders. If differences can be detected at the beginning of the project, resolution of the resulting conflicts can be dealt with early in the process. These resolutions can be incorporated into an approach called consonance. The organization needs to concentrate on building a culture that promotes consonance. To help clarify the expectations among stakeholders, the setting of common goals would prove effective (Cowan et al., 1992). By creating a common set of metrics between the two stakeholders, an understanding of common goals is promoted. Goals can serve as motivational devices that compare a person's present capacity to that capacity required to succeed in reaching

a specific outcome (Locke and Latham, 1990). According to goal setting theory, people will perform at their best when they accept expectations as their own goals. An example would be when IS personnel accept and understand IS end users expectations about a new system.

Research has shown that the resolution of discrepancies from multiple sources is deemed an effective evaluation and control technique (London and Smither, 1995). Current evaluation systems, using the 360 degree evaluation approach, demonstrate the ability to gather multiple evaluation data. The various potential sources for feedback for these ratings would include IS staff, IS end users, and management. The measures used in the evaluation procedures should be correlated with the goals of the organization to encourage goal attainment rather than rewards attached to the job (Kerr and Bettis, 1987). Goal setting can be augmented with the use of 360 degree evaluations. The feedback from multiple sources on issues pertinent to a person's work will keep that person informed about perceptional differences between groups and allow a better understanding of other people's expectations of their own performance. When endowed with the knowledge of others' expectations it is easier to align oneself to current situations. This creates better goal alignment and more effective and efficient productivity.

Consonance must be inclusive of many dimensions so that all relevant success criteria are considered. The need for consonance is cumulative; that is, the greater the number of stakeholders that are involved in the process and the greater the number dimensions of success that are considered, the greater the need for consonance in a new system or service. Management must be dedicated to consistency to produce the idea of

consonance in all projects. The ability to always view attitudes and opinions prior to starting a project will help align a set of goals that all stakeholders will support.

Future Research

This research is very general in nature, and further refining in specific areas could improve the analyses. This study is compatible with the 360 degree evaluation process. The consonance process includes multiple stakeholders and produces constructive feedback for the various participants. Consonance is designed to improve harmony among the stakeholders and assist in setting goals that are understood by all participants. These goals should be in alignment with organizational goals. In order for consonance process to gather pertinent information, the two stakeholders, IS end users and IS personnel, must have had previous contact on a project in order to evaluate the performance skill areas.

This study is in alignment with the 360 degree evaluation process. The consonance process includes multiple stakeholders and produces constructive feedback. Consonance is designed to improve harmony among the stakeholders and assist in setting goals that are understood by all participants and in alignment with organizational goals. Better communication of goals and accomplishments between IS end users and IS personnel should increase the overall efficiency and effectiveness of the organization.

In future studies, it could be beneficial to examine reactions to discrepancies between self perception and user feedback. Ideally, one would want IS Personnel performance to increase rather than lower to meet the IS end user evaluation. results and where better performance is needed.

Limitations

There are limitations to this study. The sample size was small but adequate. Additional samples with larger numbers need to be utilized to strengthen the reliability of this instrument. The sample for this research is very diverse and does not focus on any specific industry or organization type; thus, it needs refining. The instrument and process should be confined to specific areas such as technical support, system analysis, and software engineering for comparison of results. Each of these areas may be unique enough to require some specific changes of the process to enhance its predictive and enabling powers to guide an IS system to success. This process should also be reexamined in those companies that have complied with the suggestions resulting from this study in order to appraise any improvements or lack of improvements in the organization. The current research mentions the need for management input and guidance. That area needs to be formulated and incorporated to a point that is instilled in the company's culture. Consonance should be an ongoing and all encompassing practice to increase the understanding among stakeholders.

CHAPTER 4

CONCLUSIONS

Although tangible, objective measures such as time, money, and other available resources are an important segment of the success of any project, there are other underlying factors that can affect those measures. People are involved in organizations, and that itself creates complexity. Thought patterns may vary widely while involved in a project if management does not have a mechanism in place to keep all personnel on the same organizational path. People tend to follow a path that will fulfill their own needs and desires, and that does not always benefit the organization. Creating new ways of measuring perceptional attitudes and comparing the results to each person's beginning expectations, ending perceptions, and between groups will produce valuable information at the beginning of a new project to assist in the planning and goal setting stages. The information obtained from these subjective measures should increase the acceptability of and success of a project. It will also help guide the process of system creation in terms of facilitating a better understanding between stakeholders relative to each person's perceptions, expectations, and interests. This in turn, will improve relationships among the stakeholders and improve efficiency and effectiveness within the organization. Management's monitoring and guidance of individual desires, in order to direct them toward organizational goals will also help provide positive results for objective measures

by containing costs and honoring time constraints since all stakeholders will be more attuned to each other's expectations and desires.

This research gathers these components into a new system in new ways to help guide IS providers and IS end users toward a higher success rate for new IS projects and the refinement of existing information systems. By using a relatively new construct of performance and combining that with other theories for measurement, management can create a more harmonious environment among the players. This in turn creates a situation that allows the development and/or refinement of IS in a more orderly, efficient, and effective manner with improved project success rates and improved performance in the objective measures of time and budget.

The components used in this research are varied. A new performance construct designed by Jiang et al. (2000) was used, and a satisfaction scale was used: the UIS scale developed by Baroudi and Orlikowski (1986). These scales were rigorously tested for validity through the use of CFA testing to check the fit of the questions used with their respective categories. Convergent validity was checked through the use of the CFA. Confidence interval tests were used to check discriminant validity for all of the instruments used. The results of all of the tests can be viewed in Tables 3, 4, 5, and 6. Testing upheld the validity of all the scales used in this research.

Table 7 presents the results of two paired t-tests that were conducted to establish the differences between expectations and perceived results of performance for the two stakeholders (IS end user and IS personnel). Both of the t-tests are significant, verifying there is a gap in the expectations of both stakeholders and a gap in the perceived performance outcome. These findings support the concept that success is difficult to

achieve when stakeholders start out with different goals and expectations. Therefore H1 and H2 in Chapter 2 are supported. These hypotheses stated that a difference in perception exists between users and IS professionals in expectation and perceived delivery.

Table 8 presents the descriptive values of the user satisfaction measures. Based on a scale of 1 (low) to 5 (high), the overall mean was 3.76, which is rather low on satisfaction level. When it is distributed into the three corresponding segments, it appears that the relationship segment (mean=4.07) is the only area that achieves satisfaction. Knowledge (mean=3.47) and product (mean=3.67) both rank rather low.

The analysis reported in Table 9 uses the UIS section of the IS end user instrument to demonstrate the accomplishment or non-accomplishment of desired outcomes for these stakeholders. The ANOVA analysis shows that the overall UIS measure is related to the independent "wants" and "haves". The expected direction for low satisfaction, as predicted by discrepancy theory, is a positive gap between "have" and "want" and the results support that expectation. The IS end user is not satisfied with the IS personnel's performance or product delivered. Thus, H3 is supported, indicating a gap in satisfaction due lack of expected performance. All of the hypotheses Chapter 2 are accepted, verifying the predicted differences in the two stakeholders.

Chapter 3 had three hypotheses that were accepted. H1 is the same as H1 in Chapter 2. It is designed to show a difference in beginning expectations of the two stakeholders. In Table 7 the results are reflected for the paired t-tests (overall construct) that was conducted to establish the differences between expectations of importance of performance for the two stakeholders. The t-test shows the difference to be significant.

This t-test matches IS end user expectations to IS personnel expectations, and the results show that each stakeholder started with differing expectations regarding the importance of the overall segment of the performance construct. Table 12 contains the results related to H2 in Chapter 3. This hypothesis states there is a difference in IS personnel predictions of IS end user importance ratings for performance and the actual performance ratings made by the IS end user. The results of the paired t-tests show a gap in that perception. The IS personnel really do not understand how the user will rate that importance. Theory shows (social perception theory and goal setting theory) that the two stakeholders are probably working toward different goals.

The analysis reported in Table 13 supports H3 in Chapter 3. Data from the UIS scale and the performance construct scale demonstrate the misalignment of perceptions between the primary stakeholders (IS end user and IS personnel). The misalignment of perceptions is shown two ways – through correlation analysis and two regression analyses to show gap effect. Thus H3 is accepted. There is a gap effect in expectations. The negative for "want", as predicted by discrepancy theory, indicates the IS personnel do not understand IS end user expectations.

The metrics verify that differences exist and that expectations for what the final outcome will be are very different between IS personnel and IS end users at the beginning of the project. Social perception theory is proven correct by the findings that groups with different backgrounds use a different schema to analyze current data and produce expectations and perceived outcomes that are different. These differences are upheld by the statistics in Tables 10 and 11, which show the differences in the expectation levels of each group and the perceived outcome level for each group.

Therefore, management needs a device that will bring the two stakeholders closer together in an understanding of desired needs and preferred outcomes for the new IS. All of the hypotheses in this research are upheld, validating that there are several perceptional differences between the two major stakeholders participating in this research. The primary implication is management's need for a mechanism to bring the two groups in closer alignment relative to their expectations and desired outcomes. To accomplish this task, the process of consonance is suggested.

The improvement of user satisfaction has been researched previously (Baroudi et al., 1986; Baron and Byrne, 1991). The inclusion of IS end user involvement has been suggested. This can have several positive effects. By including people who are directly affected by the creation of new systems or the refinement of existing systems, the probability for successful use and increased efficiency of the final product can be substantially increased. Another boon for management is that the participants serve as a readily available, involved source of innovative ideas. With the two primary stakeholders working together on the creation or refinement of IS, management creates an environment that provides a better opportunity for the participants to discuss and understand the needs, wants, and expectations of all the parties involved. Increasing the probability of designing a system that would be acceptable to all stakeholders in the beginning would help cut down on cost and time overruns that result from misinterpretations of the needs of the IS end users (Ginzberg, 1981).

Consonance is attained through an effort to set goals that are acceptable to the stakeholders involved and that are in harmony with the organizational strategy. When the planning process includes all pertinent input from affected stakeholders, the resolution of

major differences can be dealt with early in the process, and acceptable solutions built into the project. The absence of major disagreements about what the expected outcome should be will improve the success rate of any project. System development that begins with early planning, includes all stakeholders that will be affected by the outcome, and devotes proper attention to acceptable goals, is a daunting challenge for any organization. Promoting consonance in an organization actually requires integrating it into the organizational culture over time. This helps insure its longevity and facilitates management's ability to maintain high success rates in IS production. Part of this consonance integration process is the creation of a set of metrics that is understood by all stakeholders so that stakeholders can be more closely aligned on a common set of goals. Part of goal setting theory is the need to convince people that they create these goals, allowing each individual some ownership and providing them with motivation to attain the established goals.

The incorporation of an in-depth evaluation system that could help expose and resolve discrepancies would also be an asset in creating consonance within the organization (London and Smither, 1995). The 360 degree evaluation system involves multiple evaluators and systems to expose and deal with discrepancies between people and allows the gathering of diverse information from many sources. If the system can be designed to correlate with the performance data gathered in this research and with organizational goals, management can be provided with a device that could prove to be an invaluable tool for educating the stakeholders about perceptional differences that exist between themselves (Kerr and Bettis, 1987). The awareness of other stakeholders' expectations would be an asset in directing the goal setting for a project.

Consonance is a cumulative process that needs include many processes. It is a process that brings people together in understanding and needs to be developed into the organizational culture for longevity. The planning and building of new information systems as well as the improvement of the efficiency of those processes are essential to organizational health. The more that people are connected with or are knowledgeable about each other, the more likely the creation of a higher efficiency level, since the team members have a higher incidence of shared, common goals. This research is designed to help management find the differences that exist, determine what causes those differences, and suggest what can be done to facilitate the project operation and create a higher success rate in IS production.

APPENDIX

SURVEY INSTRUMENTS

IS End User Questionnaire
(Modified Version)
Performance Variables

1. Quality:
   - 1: Implementing changes properly
   - 2: Understanding procedures
   - 3: Using tools consistently
   - 4: Pursuing ways to be more effective

2. Project Work:
   - 5: Defining objectives and scopes
   - 6: Providing accurate project time and impact information to users
   - 7: Producing accurate plans
   - 8: Meeting schedules
   - 9: Providing timely report about the status of project

3. General Task:
   - 10: Respond in a timely fashion
   - 11: Apply solutions to problems
   - 12: Anticipating user's needs
   - 13: Sticking with users' problem
   - 14: Keeping user informed about technology

4. Personal Quality:
   - 15: Listening and understanding users
   - 16: Showing respect to users
   - 17: Making ideas understood

5. Dependability
   - 18: Meeting commitments
   - 19: Willing to accept new assignments
   - 20: Following through; following up well

6. Teamwork and Leadership
   - 21: Contributing actively to projects
   - 22: Leading a team toward its objectives
   - 23: Coaching and supporting other team members

7. Career-relating Training
   - 24: Pursuing necessary training to remain up-to-date
   - 25: Seeking opportunities to develop skills for future advancement
   - 26: Member and participates in professional societies

Job Performance Satisfaction for Performance Variables

1. The quality of the work/service overall.
2. The project work was carried out overall.
3. The general tasks were carried out overall.
4. Personal quality overall.
5. Dependability overall.
6. Being a team player and leader, overall.
7. Career-related activities, overall.
8. The outcome of the project

End User Satisfaction - UIS

1. Relationship with IS professional.	Dissonant	1 2 3 4 5	Harmonious
	Bad	1 2 3 4 5	Good
2. Processing of requests for changes to existing systems.	Fast	1 2 3 4 5	Slow
	Untimely	1 2 3 4 5	Timely
3. Degree of IS training provided to users	Complete	1 2 3 4 5	Incomplete
	Low	1 2 3 4 5	High
4. Users' understanding of systems	Insufficient	1 2 3 4 5	Sufficient
	Complete	1 2 3 4 5	
Incomplete			
5. Users' feelings of participation	Positive.	1 2 3 4 5	Negative
	Insufficient	1 2 3 4 5	Sufficient
6. Attitude of the IS professionals	Cooperative	1 2 3 4 5	Belligerent
	Negative	1 2 3 4 5	Positive
7. Reliability of output information	High	1 2 3 4 5	Low
	Superior	1 2 3 4 5	Inferior
8. Relevancy of output information (to intended function)	Useful	1 2 3 4 5	Useless
	Relevant	1 2 3 4 5	Irrelevant
9. Accuracy of output information	Inaccurate	1 2 3 4 5	Accurate
	Low	1 2 3 4 5	High
10. Precision of output information	Low	1 2 3 4 5	High
	Definite	1 2 3 4 5	Uncertain

11. Communication with IS professional	Dissonant	1	2	3	4	5	Harmonious
	Destructive	1	2	3	4	5	Productive
12. Time required for new systems development	Unreasonable	1	2	3	4	5	Reasonable
13. Completeness of the output information	Sufficient	1	2	3	4	5	Insufficient
	Adequate	1	2	3	4	5	Inadequate

Company Information

1. Circle one: Male Female

2. How old are you? _____ years

3. Are you currently a supervisor or manager? A. Yes B. No

4. What is the total number of years IS personnel have been supporting your hardware or software needs? _____ years

During your work life, has your organization's IS department ever "loaned" your operating unit (e.g., accounting, marketing, production, etc.) one or more IS professionals:

5. for the duration of a project? A. Yes
B. No

6. for an extended (but pre-determined) period of time? A. Yes
B. No

7. indefinitely (i.e., as long as you wanted them there)? A. Yes
B. No

8. Have IS personnel ever been officially assigned to your unit? A. Yes
B. No

9. Have you formally evaluated IS personnel's <u>work</u> in the past or currently?
A. Yes, only in the past
B. Yes, only currently
C. Yes, in the past and currently
D. No, I have not evaluated IS personnel

10. Have you formally evaluated IS <u>personnel</u> who have supported you in the past or currently?
A. Yes, only in the past
B. Yes, only currently
C. Yes, in the past and currently
D. No, I have not evaluated IS personnel

IS Personnel Questionnaire
(Modified Version)
Performance Variables

1. Quality:
   - 1: Implementing changes properly
   - 2: Understanding procedures
   - 3: Using tools consistently
   - 4: Pursuing ways to be more effective

2. Project Work:
   - 5: Defining objectives and scopes
   - 6: Providing accurate project time and impact information to users
   - 7: Producing accurate plans
   - 8: Meeting schedules
   - 9: Providing timely report about the status of project

3. General Task:
   - 10: Respond in a timely fashion
   - 11: Apply solutions to problems
   - 12: Anticipating user's needs
   - 13: Sticking with users' problem
   - 14: Keeping user informed about technology

4. Personal Quality:
   - 15: Listening and understanding users
   - 16: Showing respect to users
   - 17: Making ideas understood

5. Dependability
   - 18: Meeting commitments
   - 19: Willing to accept new assignments
   - 20: Following through; following up well

6. Teamwork and Leadership
   - 21: Contributing actively to projects
   - 22: Leading a team toward its objectives
   - 23: Coaching and supporting other team members

7. Career-relating Training
   - 24: Pursuing necessary training to remain up-to-date
   - 25: Seeking opportunities to develop skills for future advancement
   - 26: Member and participates in professional societies

Job Performance Satisfaction for Performance Variables

1. The quality of the work/service overall.
2. The project work was carried out overall.
3. The general tasks were carried out overall.
4. Personal quality overall.
5. Dependability overall.
6. Being a team player and leader, overall.
7. Career-related activities, overall.
8. The outcome of the project

IS Personnel Job Satisfaction Rating

1. The job requires one to work closely with other people.
2. The job permits one to decide on his own how to go about doing the work
3. The job is only a small part of the overall piece of work, which is finished by other people or by machines
4. The job requires one to do many different tasks, using a variety of skills
5. The results of the work or likely to significantly affect the lives or well being of other people
6. Managers and users of the services let one know how well he is doing on the job
7. The job itself is set up so that one gets almost constant feedback about their performance
8. The job requires one to use a number of complex or sophisticated skills
9. The job requires a lot of cooperative work with other people
10. The job is arranged so that one does not have a chance to do an entire piece of work from beginning to end
11. Just doing the work required by the job provides many chances for one to determine how well he is doing
12. The job is simple and repetitive
13. The job can be done adequately by working alone
14. Supervisors and users of this job's services almost never give feedback about how well I do the work
15. The job is one where many other people can be affected by how well I do the work
16. The job denies one of any chance to use personal initiative or discretion in performing the work
17. Supervisors often let one know how well they think he/she is performing
18. The job provides one with the chance to finish completely with work that he she starts

19. The job itself provides very few clues about whether a person is performing well
20. The job gives one considerable opportunity for independence and freedom in how the job is done
21. The job itself is not very significant or important in the broader scheme of things

Career Satisfaction Rating

1. I am satisfied with the success I have achieved in my career
2. I am satisfied with the progress I have made toward meeting my overall career goals
3. I am satisfied with the progress I have made toward meeting my goals for income
4. I am satisfied with the progress I have made toward meeting my goals for advancement
5. I am satisfied with the progress I have made toward meeting my goals for the development of new skills

Company Information

1. Circle one: Male Female

2. How old are you? _____ years

3. Which best describes your current position?

   A. I am an IS technical/customer support staff professional.
   B. I am a systems analyst.
   C. I am an IS project leader.
   D. I am an IS manager.

4. For how many years have you, as an IS professional, been supporting users?
   _____

5. Have there been formal evaluations of your work by end users you have supported in the past or currently? (Choose one answer)

   A. Yes, only in the past
   B. Yes, only currently
   C. Yes, in the past and currently
   D. No, I have not been evaluated by end users

6. **As an IS professional, are you officially assigned to an IS department or division, or are you officially assigned to a specific unit (e.g., accounting, marketing, research and development, production)?**

    A. I am officially assigned to an IS department or division and work out of the IS department.
    B. I am officially assigned to an IS department or division, but I am loaned to operating units in which I work full time until I complete a project for them or even longer.
    C. I am officially assigned to an operating unit.

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