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Service quality using the deviation-score approach to fit in contingency theory in a U.S. Army Corps of Engineers setting

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SERVICE QUALITY USING THE DEVIATION-SCORE APPROACH TO FIT IN CONTINGENCY THEORY IN A U.S. ARMY CORPS OF ENGINEERS SETTING

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ABSTRACT

The purpose of this study is to learn how organizational work unit context, structure, and processes relate to service quality. The theoretical basis for the research is that organizational work units should be structured based on the work that they perform. If the work that a unit performs is highly variable, then the work unit should be structured in such a way as to provide flexibility, that is, few rules and procedures and highly decentralized decision making. If the work that a unit performs is not variable, then the work unit should be structured to provide a non-varying product or service to take advantage of efficiency, that is, many rules and work procedures, and highly centralized decision making. It is hypothesized that, if the work unit is properly structured then the customer will perceive high service quality and if the work unit is not properly structured then the customer will perceive low service quality. Data for this research was obtained from members of the St. Louis District Corps of Engineers. Support was found for Contingency theory's ideas on formalization and centralization that as technology moves from routine to nonroutine, work units adopt a less formalized and centralized structure. In addition, this research showed that the "fit" between a work unit's context and employee hierarchy of authority and the overall mechanistic organic nature has an effect on customer perceptions of service quality.

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I. INTRODUCTION TO THE STUDY

A. BACKGROUNΓ

The economic base of the United States is increasingly service orientated. Seventy percent (70%) of the United States economy is involved in services, not including the three fourths of manufacturing activities that represent support services (Collier, 1992). With this level of involvement of services in our economy, it is worth measuring and optimizing the effectiveness of service organizations.

B. PROBLEM MOTIVATING THIS STUDY

Despite the major role services have in the economic base of the United States, very little research has been done on how to organize service organizations. To this author's knowledge, no studies have been performed which combine traditional organizational theory and service quality theory. This study combines those two bodies of knowledge by using contingency theory with service quality as the dependent variable. Other studies have used contingency theory with productivity (ratio of output to input), employee moral (degree of maintenance of social system), and/or effectiveness (attainment of goals) as their dependent variable.

The primary problem statement is: Given a certain technology, is there an organizational structure that will maximize service quality?

This study is at the work unit level of analysis and focuses on internal customers. Internal customers are employees of a company which are exterior to a work unit that is providing the service. It is important to provide high service quality to internal customers because their attitudes, in the form of service quality perceptions, are critical to the functioning of a complex organization. They do so through the maintenance of the social action system.

The theoretical basis for the research is that organizational work units should be structured based on the work that they perform. If the work that a unit performs is highly variable, then the work unit should be structured in such a way as to provide flexibility, that is, few rules and procedures and highly decentralized decision making. If the work that a work unit performs is not variable, then the work unit should be structured to provide a non-varying product or service to take advantage of efficiency, that is, many rules and work procedures, and highly centralized decision making.

Although this study will not empirically test this proposition, it is proposed that if work units do not provide high service quality to its internal customers, then the organization will not function properly. This proposition is based on the following reasons. A complex organization is an open social action system consisting of multiple forms of differentiated but interdependent subsystems (work units). Each subsystem (work unit) has its own structure, program, or modus operandus which programs its cycle of activities. These subsystems or work units are linked by flows of information and flows of work. If the open social action system (or the flows or information and flows of work) are not functioning properly, then by definition the organization is not functioning properly.

Perceptions of poor service quality will hinder the social action system, or the flow of information and flow of work in the following way. Service quality is a second order construct that is similar to an attitude and related to, but not equivalent to, satisfaction. Service quality perceptions are considered long-term consumer attitudes and consumer satisfaction refers to short-term, service encounter-specific consumer judgments. Service quality theorists generally agree that many occurrences of satisfaction will lead to perceptions of high service quality and many occurrence of dissatisfaction will lead to perception of poor service quality. Satisfaction has also been used as an operational definition of employee moral which reflects "the degree of maintenance of the social system in an organization". Since, satisfaction is an observed variable of "the degree of maintenance of the social system", which by definition is an organization, then we may conclude that the service quality construct is also related to "the degree of maintenance of the social action system".

To give an example, if an employee is consistently dissatisfied with the services of an organizational work unit, then he/she will develop a "less that ideal" attitude or perceptions of poor service quality which will lead to a breakdown of the social action system or exchange of information and work between that person, the internal customer, and the work unit. Either he/she will reluctantly work with the work unit, or find another provider of the service, such as outsourcing.

If one were focusing on external customers, an analogy would be; if high service quality is not provided to external customers, then business would decrease.

C. PURPOSE OF THIS STUDY

1. What is to be Accomplished. Now that it has been discussed "why" it is important to provide high service quality to internal customers, "how" high service quality is provided to internal customers, which is the goal of this research, will be explored.

The objective of this research is to test the relationship between the deviation from the "ideal" work unit structure, which is based on the work that the unit performs, and the quality of services as perceived by their customers. It is hypothesized that, if the work unit is properly structured, then the customer will perceive high service quality. On the other hand, if the work unit is not properly structured, then the customer will perceive low service quality. Service quality is defined as the difference between what a customer expects to receive and what that customer perceives he/she actually received. The dimensions of service quality are reliability, responsiveness, assurances, empathy, and tangibles. The study focuses on "internal" customers.

Since this study is at the work unit level of analysis and focuses on internal customers, our problem statement becomes; Given a certain technology facing a work unit, is there a work unit structure/process that will maximize service quality to internal customers?

The main objective of this study is to test the deviation-score hypotheses which have been developed. The deviation-score hypotheses imply that there is an ideal value of structure for each value of technology that will maximize service quality. Deviations from this relationship in either direction will lower service quality.

2. The Importance of This Study. This study important in showing that there are practical benefits in combining organizational design theory and service quality theory.

This study is useful to company executives who wish to differentiate their company from their competitors based on service quality.

This study is useful to managers of service organizations. It provides them with insight into ways to maintain a healthy organization, or open social action system, through the maintenance of healthy employee attitudes or perceptions of high service quality. It provides them with a tool to measure context, structure and processes, and service quality. It provides managers with the knowledge of how their work units should be structured based on the context or technology to provide perceptions of high service quality.

This study is useful to theorists who wish to understand the relations between organizational design and service quality.

D. RELEVANT THEORY

1. The Concept of Quality. The concept of quality has evolved over the past fifty years. It has changed from a concept of "conformance to specifications" of goods in a manufacturing environment to the present concept of continuous improvement of goods and services in both manufacturing and services industries. In that transition, the concept of quality has evolved from having an acceptable number of non-conforming products in a product lot (inspection sampling), through a concept of "zero" acceptable number of non-conforming products (quality control), to the present concept of continually improving the goods and services. With each new concept of quality came a new definition and a new measurement technique.

The definition of quality is often defined by how it is measured and how it is measured is dependent upon whether one is dealing with goods (products) or services. Therefore, one first needs to identify and categorize the outputs and associated processes of the organization as either goods or services or a combination of both and decide which to measure.

In general, however, quality has two aspects: an aim (do the right thing) and an variance (do the right thing right the first time). An increase in quality is normally associated with a change in aim or a decrease in variance of some aspect of the product or service. For example, in services, an increase in service quality is defined and measured as a decrease in the variance (difference) between customer perceived service and customer expected service in key dimensional aspects of service: tangibles, reliability, responsiveness, assurance, and empathy. In other words, if a customer's perceptions of services rendered is close to what the customer expected then the customer will perceive that service as being of high quality. In the production of a product, an increase in quality is often defined and measured as a decrease in the variance (difference) between some physical parameter of successive product runs such as the decrease of the number of spelling errors in successive reports.

2. <u>Services Defined and the Characteristics of Services and their Implications</u>. Services have been defined as follows:

> "A service is an activity or series of activities of more or less intangible in nature that normally, but not necessarily, take place in interactions between the customer and (1) service employees and/or (2) physical resources or goods and/or (3) systems of the service provider, which are provided as solutions to customer problems. (Gronroos 1990, p. 27)"

"Services entail doing something for someone who is unable, unwilling or incapable of doing it for him or herself" (Mills 1986, p. 38). A service, being an activity can take many forms such as "an idea, entertainment, information, knowledge, change in the customer's appearance or health, social innovation, circumstance (being in the right place at the right time), convenience, ...security" (Collier, 1990, p. 237).

Services have three unique characteristics. They are intangibility, inseparability, and heterogeneity.

Most services are intangible (Sasser 1976; Bateson 1977; Shostack 1977; George 1977; Berry 1980; Lovelock 1981). Services are performances rather than objects. As a result, services are not manufactured and delivered to the customer. The customer often participates in the production of the service, often in the form of providing information. Where the customer participation is intense, firms have less control over the performances because the customer participation is a source of uncertainty during service delivery (Argote 1982; Larson and Bowen 1989; Kelley 1993). Customer participation in the delivery of services brings to importance the concepts of role performances, socialization, and customers as partial employees. Because services are performances and experiences rather than objects, precise manufacturing specifications concerning uniform quality can rarely be set. Moreover, since services are performances, the criteria customers use to evaluate it may be complex and difficult to capture. The concept of intangibility has two meanings: (1) that which cannot be touched, impalpable (2) that which cannot be easily defined, formulated, or grasped mentally (Berry 1980).

For many services, the production is inseparable from its consumption (Regan 1963; Sasser 1976; Carmen and Langeard 1980; Upah 1980). Services are generally produced and consumed in the same time frame. Where goods are generally produced, sold, and then consumed, services are generally sold, and then produced and consumed simultaneously. The simultaneous production and consumption means that the service provider is often present when consumption takes place and brings to importance "how" the service is distributed. How the service provider conducts himself/herself in the presence of the customer can influence future patronage decisions (Berry 1980).

Since services are intangible and inseparable, and cannot be inventoried or transported there is an immediacy or perishability (e.g. you cannot inventory or transport a haircut) with services that has implications to the management of service organizations (service delivery systems). Since there is an immediacy with services, a service manager must match the organization's capacity to supply the services with the demand for the services. The service manager is often in an environment where demand fluctuates greatly and is hard to predict. Peak demands vary across business types; restaurant peak demands occur during certain hours of the day, hair styling peak demands occur during certain days of the week, banking peak demands occur during certain weeks of the month, and income tax services peak demands occur during certain months of the year.

The service manager may adopt one of two strategies to cope with the fluctuating demand which is influenced by the labor-skill level required, job discretion, compensation rate, working conditions, training required per employee, labor turnover, hire-fire costs, error rate, amount of supervision required, and type of budgeting and forecasting required. Managers who are responsible for unskilled employees, performing jobs with little or no discretion, for low pay, and in a relatively unattractive environment, will likely adopt a "chase demand" strategy which is to modify the capacity of the service delivery system to supply the services that are demanded. Managers who are responsible for highly skilled employees, performing jobs with some or a lot of discretion, for high pay, in a relatively pleasant environment, will likely adopt a "level capacity" strategy which is to set and maintain the capacity of the organization at a level higher than projected demand levels (Sasser 1976).

In addition to the strategies just described, a service manager may develop off-peak pricing schemes, nonpeak promotions, complementary services, and reservation systems to attempt to manage the demand.

A manager may shift demand from peak periods to nonpeak periods by employing differential pricing schemes. This normally consists of offering lower prices or incentives during nonpeak periods.

A manager may develop nonpeak period demand by offering additional items or promotions. Increasing the demand during nonpeak periods may have a its drawbacks if the organization used the slack time to train new employees, do maintenance on equipment, clean the premises, prepare for the next peak, or give the workers some rest.

A manager may shift demand, or at least attention away from peak periods, by offering complementary services. This method diverts the customers attention away from waiting for the primary service. An example of this is to provide mirrors in hotel lobbies where customers may check their appearance while waiting for an elevator.

A manager may manage the demand by employing a reservation system. This method presells the production capacity of the service delivery system and often deflects excess demand to nonpeak periods or other facilities of the same company. This method reduces waiting time and guarantees customer service.

On the other side, a manager may attempt to modifying the capacity of the service delivery system to supply the fluctuating demanded. Many companies have found that it is more efficient to handle demand whenever it occurs than it is to attempt to smooth out the peaks. The service manager has more direct influence on the supply side that he or she does on the demand side. A service manager can modify the capacity of the service delivery system by using part-time employees, maximizing efficiency during peak periods, increasing consumer participation, sharing capacity, and investing in expansion potential.

A manager can increase the capacity of the service delivery system by employing part-time employees during peak periods.

A manager can analyze their processes to ensure that their service delivery system is efficient during peak demand periods. For example, the service manager may ensure that only service delivering tasks are performed during peak demand periods and support tasks are performed during nonpeak periods. Another technique is to cross train employees. During peak demand periods, employees of less utilized subunits will be able to assist in the over-utilized subunits.

A manager can increase the capacity of the service delivery system by increasing consumer participation. We have seen increased consumer participation at self-service gas stations, food bars at restaurants, and bag-em-yourself grocery stores. The disadvantages of increased consumer participation are reduced control over the service delivery system and potential objection by the consumer to doing the work. For example, when self-service gas stations first appeared, my grandfather refused to pump his own gas. He finally gave in.

A manager can increase the capacity of the service delivery system by sharing expensive and underutilized equipment with other companies. We have seen this in the medical and airline industries. When several hospitals are located in the same geographic area, each hospital may purchase a certain type of expensive equipment - cardiac, gynecological, obstetrical, kidney - and then share that equipment with the other hospitals. Airlines have shared gates, ramps, baggage-handling equipment, ground personnel, and even aircraft. This sharing has promoted the division of labor and specialization, and increased the utilization of high cost, fixed input equipment.

A manager can invest in equipment that will make future expansion relatively inexpensive. An example of this is running wiring, plumbing, and air conditioning ducts to the edge of a building where expansion will take place (Sasser 1976).

Also, since services cannot be inventoried and transported, the customer must be brought to the service delivery system or the service delivery system to the customer.

Services are heterogeneous (Berry 1980; Zeithaml et al. 1990). Services industries differ to the extent to which they are "people-based" or "equipment-based" (Thomas 1978). That is, there is a larger human component in performing some services. The involvement of people in the production of a service introduces a degree of variability in the outcome of the service. That is, the outcomes of people-based services tend to be less standardized and uniform that the outcomes of equipment-based service or goods-producing operations. The service or performance is difficult to standardize to ensure uniformity.

3. Service Quality and its Measurement. The study of service quality and its measurement began in 1985 when Parasuraman, Zeithaml, and Berry (1985) did a literature review on quality assessment and concluded that service quality can neither be conceptualized or measured by relying on traditional theories concerning the quality of goods. Parasuraman, Zeithaml, and Berry (1985) reached three primary conclusions from their literature review and a series of focus group interviews: (1) service quality is more difficult for customers to evaluate than the quality of goods, (2) service quality results from the comparison of actual service performance and the level of expected service on criteria that is defined by the customer, (3) service quality perceptions involve the process of service delivery as well as the outcome. Before Parasuraman, Zeithaml, and Berry's (1985) literature review, only a few authors had addressed service quality: Lehtinen and Lehtinen (1982), Gronroos (1982), Lewis and Booms (1983), Sasser (1976).

Parasuraman, Zeithaml, and Berry (1988) proposed that service quality is a second-order construct that is similar to an attitude and related, but not equivalent, to consumer satisfaction. Lilien, Kotler, and Moorthy (1993) defined an attitude as an overall tendency to respond consistently favorably or unfavorably toward an object. Service quality perceptions are considered long-term consumer attitudes and consumer satisfaction refers to short-term, service encounters-specific consumer judgments (Taylor 1994; Cronin and Taylor 1992, 1994; Oliver 1993; Patterson and Johnson 1993). Consumer satisfaction is believed to mediate the relationship between service quality evaluations and the ultimate behavioral intentions of customers towards service providers (Johns 1981, Woodside, Frey, and Daly 1989).

Service quality may be defined as a comparison of expectations and performance:

> Service quality is a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis. (Lewis and Booms 1983)

Gronroos (1982) developed a model of service quality in which he proposed that consumers, in evaluating service quality, compare the service they expected with the services they perceived they received.

Smith and Houston (1983) developed a model of satisfaction which used the disconfirmation paradigm. The disconfirmation paradigm maintains that satisfaction is related to the size and direction of the disconfirmation experience, where the disconfirmation is related to a person's initial expectations. An individual's expectations are (1) confirmed when a product performs as expected; (2) disconfirmed, in a negative sense, when the product performs more poorly than expected; and (3) disconfirmed, in a positive sense, when the product performs better than expected.

(Churchill and Surprenant, 1982). The consumer will experience satisfaction when expectations are confirmed or positively disconfirmed. In their model, Smith and Houston (1983) defined expectations as cognitive scripts.

Parasuraman, Zeithaml, and Berry (1988) proposed that service quality should be operationalized as a comparison between (a) the expectations a consumer holds for a class of service providers and (b) the relative performance of a firm on specific attributes related to service quality. The following relationship represents the service quality construct: Service Quality = f (Performance - Expectations).

Parasuraman, Zeithaml, and Berry (1988) operationalized the service quality construct by developing and proposing the SERVQUAL survey instrument. The original SERVQUAL survey was comprised of a set of twenty-two paired expectations/performance items which purported to capture the domain of service quality. One half of these items are intended to measure customer's expected levels of service for a particular service industry (expectations). The other twenty-two matching items are intended to measure the perceived level of service provided by a particular organization (perceptions). Service quality is measured by calculating the difference scores between the corresponding items (i.e., perceptions minus expectations). Parasuraman, Zeithaml, and Berry (1988) used factor analysis to suggest that the domain of service quality can be conceptualized as comprised of five, first-order dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Parasuraman, Zeithaml, and Berry (1988) measured the quality of service provided by an appliance repair and maintenance firm, several retail banks, a long distance telephone provider, a securities broker, and a credit card company.

Parasuraman, Berry, and Zeithaml (1990) subsequently added a series of items that captured the relative importance that the service firm's customers attaches on each of dimensions of service quality. The following relationship represents the weighted form of service quality measurement using the SERVQUAL scale: Service Quality = f (Performance - Expectations) * Importance. The difference scores of the 22 items that represent the five dimensions of service quality can be treated as weighted or unweighted. The individual factor scores are summed and averaged into the five dimensions of quality and the overall service quality score is obtained by summing and averaging the five factor scores.

There appears to be a consensus that service quality is a second-order construct; however, there are alternative conceptualizations with regard to the number of first-order dimensions. Lehtinen and Lehtinen (1982) defined service quality as a 3-dimensional construct consisting of "interactive," "physical," and "corporate" quality dimensions. Gronroos (1984) conceptualized service quality as a 2-dimensional construct consisting of "technical" and "functional" quality. Hedvall and Paltschik (1989) conceptualized service quality as a 2-dimensional construct consisting of "willingness and ability to serve" and "physical and psychological access". Most recently, Carmen (1990) suggested that the service quality construct consist of five to nine distinct dimensions depending on the type of service sector under investigation.

Despite these alternative conceptualizations SERVQUAL has enjoyed wide popularity. The SERVQUAL scale has been used in general service environments (Berry and Parasuraman 1991; Bolton and Drew 1991a, 1991b; Carman 1990; Gronroos 1990; Heskett, Sasser, and Hart 1990; and Zeithaml, Parasuraman, and Berry 1990), information service environments (Kettinger and Lee 1995), health care environments (Babakus and Mangold 1989; Brown and Swartz 1989; Woodside, Frey, and Daly 1989; and Reidenbach and Sandifer-Smallwood 1990), recreational services environments (Crompton and Mackay 1989; Hamilton 1989; and Mackay and Crompton 1988), professional service environments (Bojanic 1991), real estate brokerage environments (Johnson, Dotson, and Dunlop 1988), higher education environments (Ford, Joseph, and Joseph 1993), logistics environments (Stank 1993), motor carrier services environment (Brensinger and Lambert 1990), retail environments (Finn and Lamb 1991), and airline carrier environments (Elliott 1995).

Despite its wide use, a number of studies have questioned the efficacy of the SERVQUAL scale, the conceptualization of the service quality construct, and the SERVQUAL methodology as an appropriate operational definition of service quality.

Carmen (1990) attempted to replicate and test the SERVQUAL dimensions and measures. Carmen's replication found mild support for the reliability and validity of the SERVQUAL dimensions when the scale was customized to different service settings: a dental school patient clinic, a business school placement center, a tire store, and an acute care hospital. Carmen (1990) suggested that the SERVQUAL scale may not exhibit the five-factor scale across all service industries. He suggested that when one of the dimensions of quality is important to customers, then they are likely to break that dimension down into subdimensions. Carmen (1990) also questioned the expectations and perceptions gap model which underlies the SERVQUAL scale. He suggested that the perception-expectation data be collected directly via one question instead of asking a question about each separately. e.g., "The visual appeal of XYZ's facilities are (much better, about the same, worse, or much worse) than I expected".

Babakus and Boller (1992) specified a number of methodological shortcomings of the SERVQUAL technique. They questioned: 1) the validity of SERVQUAL as a 5-dimensional measure of perceived service quality; 2) the appropriateness of operationalizing service quality as a difference score; and 3) the use of negatively worded items (two of the SERVQUAL dimensions are loaded with negatively worded items: responsiveness and empathy).

Given the disagreement on the number of dimensions of the service quality construct and the lack of empirical evidence that service quality is a second-order construct, Babakus and Boller (1992) suggest that it is unclear whether SERVQUAL is measuring a number of distinct constructs or a global, more abstract variable. Their tests of convergence and discrimination validity did not indicate the existence of the 5 dimensions proposed by Parasuraman, Zeithaml, and Berry (1988). Their results suggested that the dimensionality of the service quality construct is a function of the type of service under investigation.

Babakus and Boller (1992) found that the difference scores did not provide any additional information beyond that already contained in the perceptions component of the SERVQUAL scale. That is, the expectation scores did not add to the explained variance of the operationalization of service quality. Rather the dominant component in the difference scores is the perceptions scores. In other words, the correlation between the difference scores and a "third variable" is dominated by the perceptions scores.

Babakus and Boller (1992) cautioned against using negatively-worded items in any survey item attempting to operationalize the service quality construct. Their analysis of expectations and perceptions components of the SERVQUAL scale produced a 2-dimension factor structure which appeared to be determined by the direction of the item wording. That is, the negatively worded items loaded heavily on one factor and the positively worded items loaded heavily on the other factor. They suggested that the instruction section of the scale might contain a warning to the respondents on the existence of negative/positive wording in order to reduce the detrimental effects of item wording (Schmitt and Stults 1985). Babakus and Boller (1992) concluded that the SERVQUAL items themselves appear to capture the domain of the service quality construct, but the reliability and validity of the combined items appear suspect.

The recommended improvements to the 1988 SERVQUAL scales, recommended by Carmen (1990) and Babakus and Boller (1992) aimed at overcoming problems created by using negatively worded items, were made by Parasuraman, Berry, and Zeithaml in their 1991 instrument.

A number of other studies have examined the psychometric properties of the SERVQUAL scale.

Brensinger and Lambert (1990) used the motor carrier services environment with a sample size of 170. They used a mail survey, principal-axis factor analysis by oblique rotation, and obtained cronbach alphas of .64 to .88 with the five Parasuraman Zeithaml, and Berry (1988) dimensions of tangibles, reliability, responsiveness, assurance, and empathy.

Finn and Lamb (1991) used the large retail store environment, like K-mart, with a sample size of 58-69 across settings. They used a telephone survey, LISREL confirmatory factor analysis, and obtained cronbach alphas of .59 to .83

with a poor fit for the 5-dimensional structure. No alternative factor structure was examined.

Parasuraman, Berry, and Zeithaml (1991) used a telephone company, an insurance company, and a bank with a sample size of 290-487 across settings. They used a mail survey, principal-axis factor analysis by oblique rotation, and obtained cronbach alphas of .80 to .93 with the five Parasuraman, Zeithaml, and Berry (1988) dimensions of tangibles, reliability, responsiveness, assurance, and empathy (six if 'tangibles' is split into two dimensions).

Cronin and Taylor (1992) used the banking, pest control, dry cleaning, and fast food industries with a sample size of 84-96 across settings. They used an on-site survey, principal-axis factor analysis by oblique rotation, and obtained cronbach alphas of .85 to .90 with a single clear service quality dimension.

Pitt, Watson, and Lilford (undated) used the information services function of a large financial institution with a sample size of 237. They used an on-site survey, principal-axis factor analysis by oblique rotation, and obtained cronbach alphas of .62 to .87 with the five Parasuraman, Zeithaml, and Berry (1988) dimensions of tangibles, reliability, responsiveness, assurance, and empathy (seven if 'tangibles' and 'empathy' are split into two dimensions).

The collective results of these studies, which examined the psychometric properties of the SERVQUAL scale, provide consistent support for the reliability, face validity, and predictive validity of the SERVQUAL's five dimensions. Support for convergent and discriminant validity are mixed because several studies showed items loading on different dimensions. The number of factors retained has not been consistent across studies (Kettinger and Lee 1995).

In addition to Carmin (1990) and Babakus and Boller (1992), Cronin and Taylor (1992) and Brown, Churchill, and Peter (1993) argue in favor of a performance based measure of SERVQUAL. Cronin and Taylor (1992) developed the 22-item SERVPERF instrument. Cronin and Taylor's SERVPERF scale utilizes the 22 perceived performance items used in the SERVQUAL instrument. Cronin and Taylor (1992) showed stronger predictive validity for the SERVPERF instrument using only perceived service quality performance as opposed to the SERVQUAL's gap scores of performance minus expectations. Parasuraman, Zeithaml, and Berry (1994) stated that the superior predictive power of the performance-only measure must be balanced against the inferior diagnostic power. The SERVPERF instrument has been identified as being superior in explaining variance in an overall measure of perceived service quality (Cronin and Taylor 1994). SERVQUAL, on the other hand, has been shown to more accurately identify service shortfalls and deficiencies within a company (Parasuraman, Zeithaml, and Berry 1994). Elliott (1995) suggested that one should choose between SERVQUAL or SERVPERF based on whether explaining variance or identifying deficiencies is more important. Using performance scores (SERVPERF) may lead to different perceptions and decisions with regard to areas of quality enhancement that need attention (Elliot 1995). For example, if one obtained a SERVPERF score of 4.5 on "reliability" and a SERVPERF score of 3.9 on "empathy" one may conclude that the "empathy" area of performance needs more attention than the "reliability" area of performance. However, if for the same sample, one obtained a SERVQUAL score of (-1.4) on "reliability" and a SERVQUAL score of (-1.2) on "empathy" one would conclude that there is a more serious deficiency in the "reliability" area of performance than in the "empathy" area of performance. This situation occurred in Elliott's 1995 study.

4. Role Theory. Role theory is important because customer expectations have been suggested to be cognitive scripts (Smith and Houston 1983).

Services may be classified as people-based (professional services) and equipment-based (direct mail, automatic teller machines, insurance). This study is concerned with people based services. The service encounter is a social, human interaction between two people. In order to understand the service encounter, it is necessary to look at both parties of the encounter as a dyad and not individually (Solomon et al. 1985). There exists an interdependence between both parties. A service encounter is a form of social exchange in which the participants seek to maximize the rewards and minimize the costs of the transaction (Homans 1961). The service encounter is a dyadic interaction involving a buyer and a seller or a series of dyadic interactions involving several organizational members. The service encounter is a special case of a more general class of goal-oriented dyadic interaction. Dyadic interactions involve two people who are acting out learned and consistent behavior patterns called "scripts" which must be followed for a transaction to proceed smoothly (Solomon et al. 1985). A script may be defined as "a predetermined, stereotyped sequence of actions that defines a well-known situation" (Schank and Abelson 1977, p.41). This definition was extended as follows: A script for a commonplace event consists of the standard actions, characters, and objects involved in the event. Scripts are intended to represent knowledge about events which are so well practiced in everyday life that their performance is stereotyped. The service encounter is a purposive transaction whose outcome is dependent upon the mutual coordination of appropriate behavior vis-a-vis the other person (Thibaut and Kelly 1959). The service experience is the true outcome or product of the service interaction (Solomon et al. 1985).

A role is a cluster of social cues that guide and direct an individual's behavior in a given setting. The study of roles is the study of socially defined positions rather than the individuals that occupy those positions. Service encounters are role performances. Each participant to an interaction has a role or script to play which is goal orientated, agreed upon by society, and ritualized in nature. Role theory emphasizes people as social actors who learn behaviors that are appropriate to the positions that they occupy in society. The "actors" in a service setting, both service provider and customer/client, have a repertoire of roles or scripts (Solomon et al. 1985). The particular role or script that the service provider or customer/client adopts is dependent upon the specific service environment or situational cues (Lutz and Kakkar 1976). A customer entering a restaurant with plush furnishings will evoke a script or set of behaviors which is quite different than the script or set of behaviors that he/she would have evoked if he/she had entered a restaurant with sparse furnishings. Or a service provider of an exclusive restaurant will evoke one script or set of behaviors with a customer entering the restaurant in a suit and tie and a different script or set of behaviors with a customer entering the restaurant in cut-off shorts, no shoes, and tee shirt.

5. Organizational Design Theory.

a. Organizational Paradigms. A paradigm is an accepted way of solving a problem which then serves as a model for future workers. It is a set of shared values, test methods, standards and generalizations shared by those trained to carry on work that models itself on the accepted way of solving a problem. It is not merely rules, laws, and theories or a mere sum thereof, but something more "global" from which rules and theories can be abstracted. Alternate paradigms of organizational theory have been developed to analyze organizations. They are:

(1) The classical or comparative management paradigm purported by Barnard (1938) and grounded in functionalism (Malinowski 1961). The emphasis in classical management theory is the curtailment of individual freedom through the application of rational control.

(2) The contingency management paradigm purported by Thompson (1967) and grounded in structural functionalism (Radcliffe-Brown 1952). Researchers functioning in this paradigm test hypothesis of the effects of the "fit" between contextual and structural variables on an outcome variable (organizational performance).

(3) The organizational cognition paradigm purported by Weick (1979) and grounded in ethnoscience (Goodenough 1971). Researchers functioning in this paradigm, view organizations as ongoing cognitive processes, bodies of thought, and sets of thinking practices. Organizations viewed as bodies of thought can be described as recurring schemata, causal textures, and sets of reference levels. Organizations viewed as thinking practices can be described in terms of dominant rules for combining cognitions, routine utterances, mixtures of habituation and reflection, nature of rehearsing, and preferences for simplification. This paradigm sees managerial work as managing myths, images, symbols, and labels. (Weick 1979a) Researchers seek to understand shared cognitions, values and beliefs, and unique ways that members perceive and organize their world, in order to understand what guides their behavior (Weick 1989). Researchers also seek to spot the

thinking people in an organization, learn what they are thinking, and study how those thoughts are, or are not, diffused through the organization (Weick 1979a).

(4) The organizational symbolism paradigm purported by Dandridge, Mitfoff, and Joyce (1980) and grounded in symbolic anthropology (Geertz 1973). This organizational paradigm brings attention to the "deep structure" of an organization. It emphasizes symbolic phenomena such as stories, myths, ceremonial events, logos, and day-to-day jokes that organizational members use to make comprehensible the unconscious feelings and images that are inherent in the organization and to express the underlying character, ideology, or value system of the organization. Each symbol expresses the "deeper layers of meaning" inherent in all human forms of organization and culture. Theorist of this paradigm believe that symbols serve the functions of describing the system, controlling the flow of energy within it, and maintaining or aiding in the systems modification (Dandridge, Mitfoff, and Joyce 1980).

(5) And, the structural/psychodynamic paradigm purported by Turner (1983) and grounded in structuralism (Levi-Strauss 1963). Researchers functioning in this paradigm see organizations as forms of human expression rather than goal-oriented, problem solving instruments (Desphande and Webster 1989). They emphasize that there are enormous amounts of other patterned social relationships that are intertwined with the pattern that the "formal structure" depicts (Turner 1983).

They also stress the philosophical nature of knowledge in that they accept other concepts or paradigms of organizational structure as being valid whether structure is thought of as being real, organic, open, or whatever (Turner 1983).

b. Complex Organizations. A complex organization is an open social action system consisting of multiple forms of structures and processes. This action system is a repetitive cycle of transforming inputs into outputs (Katz and Kahn 1978). Since inputs are processed to yield outputs, there are goal-directed events in the transformation cycle with cause and effect relations among the events (Parsons 1949). These events may be grouped by function and activities to achieve the benefits of process specialization (Thompson 1967). Each event has its own cyclical pattern of sub-goal directed activities and is therefore a subsystem (Katz and Kahn 1978). This grouping of activities form jobs. Jobs may further be grouped into work units (sections, branches, division, and departments). The work units (sections, branches, division, and departments) represent the vertical and horizontal differentiation of a complex organization. The work units (sections, branches, divisions, and departments) are often thought of as being the organizational structure and are most visible in the organizational chart. These groupings, or organizational structure, serve to control and distinguish the parts of a complex organization. Work units, in turn, adopt a structure, program, or modus operandus which is determined by the nature of the work that the unit performs. This structure, program, or modus operandus organizes the transformation process into a predictable pattern of cyclical activities (March and Simon 1958).

To have an organizational chart depicting work units (sections, branches, divisions, and departments) is not necessary or sufficient to have an organizational structure. What is necessary and sufficient is that the employees know what they are supposed to do and with whom they are to do it. An organizational chart depicts the intended chain of command and authority, but does not show important lines of communication and influence. The organizational chart shows positional power but not other sources of power such as expert, referent, personal, and informational.

Organization structure "...implies a configuration of activities that is characteristically enduring and persistent; the dominant feature of organizational structure is its pattern of regularity" (Ranson, Hinings, and Greenwood 1980). This pattern of regularity of activities are the processes of an organization. These processes within and between organizational components are exhibited in the flow of work and information among actors (Van de Ven 1976).

Therefore, complex organizations consist of multiple forms of differentiated but interdependent subsystems (work units). Each subsystem (work unit) has its own structure, program, or modus operandus which programs its cycle of activities.

c. Organizational Design and Organizational Dimensions. Organizations are purposeful and goal orientated. It follows then that organizational structures are purposeful and goal oriented (Huber and McDaniel 1986). Organizations are designed to influence the behavior of individuals and groups toward those purposes and goals (Miller 1987).

The design of a complex organization requires a theory and methodology that integrates macro (overall organization) and micro (work unit) level of analysis.

The design of an organization is not a deterministically occurring condition. It is the result of strategic choices made by organizational administrators (Child 1972). Strategic decisions on the overall design of an organization are made in the context of economic considerations of *demand* for goods and services and *supply* of needed input resources. Organizations are dependent to varying degrees on their environment for survival (Burns and Stalker 1961; Lawrence and Lorsch 1967). The environment is defined as factor markets which are composed of organizations and parties that supply the organization with its input resources and product markets which are composed of the organizations and parties that receive the organization's products or services. The basic elements of micro-economic theory of a firm are the product market's demand for an organization's outputs and the factor market's cost of inputs for supplying them (Samuelson 1948). Determining the best level and combination of inputs for the provision of a particular level of outputs is defined as the economic production function problem (Henderson and Quandt 1958). The economic production function problem must be solved before the organizational design problem can be solved. Solving economic production function problem provides the organizational designer with the quantity and combination of inputs and outputs. The organizational design problem is defined as the most appropriate use in transforming a particular combination of inputs to achieve a desired level of output (Van de Ven 1976).

The projected demand for an organization's products or services represents the product market potential and the opportunities open to an firm. The product market potential is the quantity of products or services that can be sold or delivered over a set time period and is determined by forecasting methods and consumer surveys. Once the demand or output level of the firm's products or services are projected over a future time period (usually a year), management determines the quantity and cost of inputs necessary for producing at that output level (Baumol 1965).

The input and output quotas, which are determined by the economic production function, become the short-term goals for an organization. The output quota becomes the *production* goals of the organization and measures the impact of the organization on its environment. The input quota, or budget, becomes the internally-orientated *maintenance* goals of the organization and measures the intended impact of what the organization does to maintain itself. The input quota level, or the quantity of external resources needed to meet the input quota level, is an operational indicator of the degree of *resource dependence* that an organization has on its environment in a given time period. The inputs to an organization are categorized as *variable* inputs or *fixed* inputs. *Variable* inputs must be supplied by the factor markets during the operating period to meet its input quotas. *Fixed* inputs, like plant and equipment, may be supplied in previous operating periods (Mohr 1973).

To design an organization is to make decisions and take actions that result in organizational structure (Willmott 1981). The design of an organization begins at the macro-level which provides the size of the organization and the degrees of vertical and horizontal differentiation, usually in the form of the number of work units. The size of the organization and degrees of vertical differentiation in turn provides the skeletal framework within which an analysis of the characteristics and interrelations of micro-organizational components (work units) can take place.

The overall design of the organizational structure entails making strategic decisions on the division of labor, type of departmentalization, span of control, and delegation of authority (Gibson, Ivancevich, and Donnelly 1991).

Division of labor is the extent to which jobs are specialized (Gibson, Ivancevich, and Donnelly 1991). The work of an organization is divided into jobs with specific activities depending upon what is to be accomplished by the job incumbent. The specialization of jobs provides economies of production and is the primary historical reason for the creation of organizations (Kopelman 1985). The division of labor in organizations occur in three ways: by personal specialties, (engineers, accountants, etc), by natural sequence of the work (receiving, manufacturing, distribution), and by level in the organization that the work is performed (technical, managerial, institutional) (Gordon 1983). The total work of the organization is broken down into smaller tasks (Gibson, Ivancevich, and Donnelly 1991). In service organizations, the division of labor can be by high contact employees (front-office) and low contact employees (back-office) employees (Chase and Tansik 1983). The division of labor in service organizations can also be between employees and customers (Larson and Bowen 1989).

The next decision in the overall design of the organization is on what criteria to combine the divided tasks (jobs) to groups or departments. This is the basis for departmentalization and can be by function (engineering, finance accounting, etc.), by territory or geographic area (Southwest division, Northeast division, etc.), by product or product line (Canned, Frozen, etc.), or by consumer or client (petits, boy's clothing, men's clothing, women's clothing, etc). Departmentalization is necessary when the number of specialized jobs increase to the point where one manager can no longer effectively coordinate them. Therefore, coordination forms the basis or need for departmentalization.

The principal advantage of using the functional design is its efficiency. The major disadvantage of the functional design is sub-optimization which occurs when sub-unit goals are pursued at the expense of organizational goals. The territorial design is often used when physical separation make centralization difficult and provide good training ground for managerial personnel. The product design is often used when a company is large and diverse. A fifth organizational design, the matrix design, combines the product or project design and the functional design and is used when an organization must respond to rapidly changing technological or market environments, face uncertainties that require large amounts of information to be processed, or operate under financial and human resource constraints (Gibson, Ivancevich, and Donnelly 1991).

Once the basis for departmentalization has established the kinds of jobs to be grouped together, the manager must decide the number of jobs to be included in a specific group or the span of control. The main determinates of the span of control are; the complexity of tasks performed by subordinates, the extent to which administrators supervise their employees, and the complexity of the supervisors' jobs (Bell 1967).

Finally, the manager must decide how much authority to delegate to each job and each jobholder. Authority is the right of individuals to make decisions for others without the approval of higher management when alternatives exist and to exact obedience from others (Gibson, Ivancevich, and Donnelly 1991; Mills, Chase, and Margulies 1983). A high degree of delegation of authority makes a decentralized structure. A decentralized structure provides a good training ground for managers and fosters competition and autonomy.

The four managerial decisions of division of labor, basis of departmentalization, spans of control, and delegation of authority will result in the structure of the macro-organization.

An organizational structure is most often described by the dimensions of centralization, formalization, and complexity (Weber 1947; Hall 1962; Hage and Aiken 1967; Blau and Schoenherr 1971; Child 1973; Mansfield 1973; Reimann 1973; and Walsh and Dewar 1987).

The concept of centralization refers to delegation of authority among jobs in an organization or the location of decision making authority in an organization. High centralization, as it relates to the four managerial decisions on the overall design of the structure, are as follows: high job specialization, functional departments, wide spans of control and high centralization of authority (Gibson, Ivancevich, and Donnelly 1991).

The concept of formalization refers to the extent to which the expectations of ends and means of work are specified and written. High formalization, as it relates to the four managerial decisions on the overall design of the structure, are as follows: high job specialization, functional departments, wide spans of control, and low delegation of authority.

The concept of complexity refers to the number of different jobs and the number of different units in an organization. High complexity, as it relates to the four managerial decisions on the overall design of the structure, are as follows: high job specialization; territorial, customer and product departments; narrow spans of control; and high delegation of authority (Gibson, Ivancevich, and Donnelly 1991).

Once the design of an organization at the macro-level is complete, the design at the micro-level may begin. The design of an organization at the macro-level provides the size of the organization and the degrees of vertical and horizontal differentiation, usually in the form of the number of work units. The size of the organization and degrees of vertical differentiation in turn provides the skeletal framework within which an analysis of the characteristics and interrelations of micro-organizational components (work units) can take place.

The design of the micro-level, subsystem, or work unit level of analysis provides the unique patterns of design within a complex organization. By definition, a complex organization consist of multiple forms of differentiated but interdependent subsystems (work units). These patterns of design define the interrelationships among the work units and their structure, program, or modus operandus which programs their cycle of activities. An example of a model which defines three patterns of design for a work unit is provided by Van de Ven (1976). This model will be discussed in the next section under Organizational Assessment Models.

The design of a service can be compared to the design of a process rather than a design of a thing (Evans and Lindsay 1989). In designing a service organization, the manager must keep in mind what it is he is trying to achieve and usually comes down to the paradox of providing efficient service at the expense of customized, personalized service or customized, personalized service at the expense of efficiency.

In summary, the result of organizational design is a system of jobs and units, and the processes that link them, which work toward common goals and purposes.

d. Organizational Assessment and Organizational Assessment Models. Organizational assessment is the measurement of variables related to patterns of organizational behavior and effectiveness. Organizational assessment models are theories of organizational functioning aimed at explaining patterns of behavior that can be observed within and around organizations (Nadler 1981). An organizational model includes constructs relevant to organizational behavior, statements of relationships among those constructs, and at least one construct that represents some output of the organization that is being assessed (Nadler 1981). Models answer the question, "What should be assessed?" Models differ in their level of analysis (perspective models, organizational models, and organizational submodels); nature of boundary relations (open or closed system); conception of purpose (performance of tasks or other); degree of specificity of constructs and their relationships (few, non-operationally defined constructs with only basic relationships defined or many, operationally defined constructs with detailed descriptions of their relationships); and the nature of the relationships among the constructs (causal, correlational, or reciprocal) (Nadler 1981). Under the level of analysis, there are "perspective models" like Katz and Kahn's (1978) open-systems theory which provides the underpinnings of a general approach for thinking about organizations. Perspective models often do not have operationally defined constructs but allow the development of more specific organizational models. Organizational models describe and predict how organizations function. Organizational models cannot specify all of the variables that make up the major constructs of organizational behavior, so organizational submodels are developed that relate specific subclass of organizational behavior such as motivation, satisfaction, work design, leadership, and organizational structure and design (Nadler 1981). Submodels also have different levels of analysis: individual, group, and organizational.

The individual-level submodels often incorporate psychological theory and research in such areas as perception, learning, effectiveness (Campbell, Dunnette, Lawler, and Weick 1970) motivation and satisfaction (Vroom 1964; Locke 1969; Alderfer 1972; Porter, Lawler, and Hackman 1975; Salancik and

Pfeffer 1978), and disconformation (Smith and Houston 1983). These submodels often provide a framework for assessing organizations in terms of the functioning of their individual members. An example of an individual-level submodel is Porter-Lawler-Hackman's (1975) Model of Individual Performance in Organizations. This model takes into consideration individual variables such as personal needs and values, outcome valences, and level of skill and arousal and incorporates an expectancy model of motivation. Another example of an individual-level submodel is Smith and Houston's disconformation paradigm model.

The group-level submodels often incorporate social psychological theory and research in such areas as group processes and performance (Schein 1965, Smith 1973; Hackman and Morris 1975), leadership (Vroom and Yetton 1973; House and Mitchell 1974), and intergroup conflict (Thomas 1976; Filley 1975). These submodels often provide a framework for assessing organizations in terms of the functioning of their component groups. In the 60s, Likert (1961, 1967) developed a group-level submodel of effective management systems using a general systems theory background with a human relations and structuralist perspectives.

The organizational-level submodels focus on issues of structure and design (Thompson 1967; Lawrence and Lorsch 1967; Galbraith 1973). These models include information-processing models, models of structural functionism, and socio-technical systems models.

In addition to individual-level, group-level, and organizational level submodels there are integrative submodels models which attempt to integrate relationships across levels (Van de Ven 1976).

Organizational assessment consists of scouting, formal data collection, data analysis and interpretation, and communication of results. Scouting is the informal data collection where the researcher and client establish a relationship. An organizational model is important at this stage to help the assessor determine which organizational submodels are appropriate to use and which organizational information is needed. During the formal data collection, critical data about the organization is collected. The data that is collected is determined by the needs of the researcher and the assessment model. During data analysis and interpretation, the organizational model provides the researcher with theoretical relationships to test. During the communication of assessment results, the organizational model provides interested parties a common frame of reference (Nadler 1981). The researcher must decide whether to use or adapt an existing model or develop a new model.

Two of the most widely known models of organizational design are the mechanistic and organic models. The mechanistic model stresses high levels of productivity and efficiency through the use of rules and procedures, centralization of authority, and specialization of labor (Gibson, Ivancevich, and Donnelly 1991). The structural dimensions of a mechanistic organizational design are; highly complex due to the specialization of labor, highly centralized due to its emphasis on authority and accountability, and highly formalized due to its emphasis on rules and procedures and function as a basis for departments (Gibson, Ivancevich, and Donnelly 1991).

The organic model stresses adaptiveness and flexibility by limited use of rules and procedures, decentralization of authority, and low degrees of specialization. The structural dimensions of an organic organizational design are; simple, due to its emphasis on low job specialization and increasing job range; decentralized, due to its emphasis on delegation of authority and increasing job depth and; informal due to its emphasis on product and customer as basis for departments (Gibson, Ivancevich, and Donnelly 1991).

In the mid-seventies Van de Van (1976) developed one of the most comprehensive organizational assessment models to date. The model is an integrative, organizational submodel which integrates relationships across individual, group, and organizational levels. Van de Ven's model has many operationally defined constructs and is very well grounded in existing organizational theory. Van de Ven's (1976) model contains environmental factors (product or service quota, and resource dependence), overall structural configuration (organizational size, and horizontal and vertical differentiation), nature of work undertaken (task difficulty and task variability), design of micro-organizational components (specialization, standardization, discretion, and expertise), processes within and between components (work flows and informational flows), and performance (efficiency, moral, and effectiveness).

Van de Ven's (1976) model hypothesizes that macro-organizational design (size and horizontal and vertical differentiation) is determined by environmental factors (product or service quota, and resource dependence). The size of an organization is determined by the product or service demand quota. The size in turn explains the major portion of variance in the horizontal and vertical differentiation. Blau (1974a, pp. 346-348) provided the theoretical assumptions and propositions of the relationships between the number of employees (size) and structural differentiation of an organization. Child (1974) empirically examined those relationships. Child (1974) found that as size increases, horizontal and vertical differentiation increases at a decreasing rate. As an organization's size increases, organizations differentiate horizontally by grouping together like tasks and functions into micro-organizational components (subsystems, work units, sections, branches, divisions, or departments). This provides the benefits of process specialization and economies of scale. As the horizontal differentiation increases, the interdependence and the need for integration increases. Integration is achieved through vertical differentiation which is represented by the number of levels of supervision (Thompson 1967). Therefore, as horizontal differentiation increases, vertical differentiation increases.

Van de Ven (1976) proposed that the macro-organization structure (size, and horizontal and vertical differentiation) is a given or a constraint in predicting the structure, program, or modus operandus of micro-organizational components. Blau (1974a, p. 338) hypothesized that as the division of labor, in the form of vertical and horizontal differentiation, increases the greater the segregation of tasks into fewer number of jobs for each organizational unit. Perrow (1967) brought attention to the difficulty and variability of these segregated tasks as important determinates of how organizational units will be organized. Van de Ven (1976) hypothesized that the structure, program, or modus operandus (design pattern) of the micro-organizational components is contingent upon the nature of the work that the units performs. The nature of work that a unit performs is Van de Ven's *technological* construct and consists of *task difficulty* and *task variability*. Task variability is the number of exceptions encountered in the work. Task variability affects the degree to which work processes can be structured in a routinized, systematized, or mechanized way (Hall 1962; Litwak 1961; Perrow 1967; and Woodward 1965). Task difficulty consist of two dimensions: analyzability and predictability of the work encountered. These dimensions affect the amount of expertise and discretion needed to perform a task (Bell 1967; and Hage 1965). Van de Ven and

Delbecq (1974) developed a taxonomy of work unit design and alternate structural modes by examining the interaction of the effects of these two qualitative task dimensions.

Van de Ven (1976) provides three design patterns for the micro-organizational components: the systematized mode, the discretionary mode, and the developmental mode. Van de Ven (1976) major contingency hypothesis is: given various states of structural differentiation of the overall organization (horizontal and vertical differentiation) and the difficulty and variability of work undertaken by an organizational component, certain patterns of unit structure and process will lead to higher performance than other patterns. This is a "systems" approach to contingency theory which will be described in a later section. His model begins with the proposition that the greater the horizontal and vertical differentiation of the overall organization, the fewer the number of different tasks assigned to a given component. This proposition is based on work by Pugh, Hickson, Hinings, and Turner (1968); and Blau and Schoenherr (1971). This specialization of unit functions and tasks can take a number of forms (Blau 1974, 1974a). Van de Ven's (1976) model uses three forms: (1) to delegate to an organizational component homogeneous or non-varying tasks within a limited range of difficulty, (2) to delegate a variety of different tasks which have a wide range of difficulty, (3) to delegate novel and relatively difficult tasks to a work unit.

Van de Ven's (1976) model defines and operationalizes the structure of the micro-organizational component by measuring (a) the number of different tasks and activities that role occupants are expected to perform (specialization), (b) the procedures and pacing rules that are to be followed in task performance (standardization), (c) the decisions and judgements that are to be made during task execution (discretion), and (d) the skills required of role occupants to operate the program (personnel expertise or professionalism).

Once the overall structural configuration of the organization and the different design patterns of each component has been determined, Van de Ven's (1976) model examines how the components are linked together so that the organization can act as a unit. These linkages are the process activities within and between organizational components and are defined and operationalized as the direction and frequency of work and information flows. Thompson (1967) called these linkages interdependence and postulated that an organization will minimize its integration costs by grouping together the most highly (reciprocal) interdependent units first and grouping together the least (pooled) interdependent units last.

Van de Ven (1976) defines and operationalizes organizational performance by measuring (a) productivity, (b) employee moral, and (c) effectiveness. Performance is used by management, customers, employees, and investors as the ultimate criteria in the assessment of an organization.

Productivity is the efficiency of an organization and is computed as the ratio of output to input or effort. Employee moral reflects the degree of maintenance of the social system in an organization. Employee moral is commonly operationalized as absenteeism and job satisfaction. Effectiveness is the extent to which organizational goals are attained. Effectiveness is measured as the extent to which goals are attained at the end of an operating period. Van de Ven's hypotheses on the pattern variations in work unit operating programs is depicted in Table I.

In 1980, Van de Ven and Ferry (1980) updated many of their constructs to more accurately reflect the micro-organizational level of analysis. Their new constructs are (a) unit standardization (b) hierarchy of authority: supervisory, unit employee, unit collegial, and external, (c) employee and supervisory discretion, (d) number of job titles in unit, (e) role interchangeability in the unit, and (f) unit skill heterogeneity.

e. Service Organizations and Service Organization Assessment Models. The two attributes that most distinguish service organizations from manufacturing organizations are the intangibility of the output and the closeness of the consumer to the producer (Fuchs 1968). The interface of the employee and the consumer is referred to by Thompson (1962) as a transaction in which information is exchanged. Information is

Table I Van de Ven's (1976) Hypotheses on Patterned Variations in Unit Operation Programs

MACRO-ORGANIZATIONAL CONTEXT	Structural Differentiation (1) Horizontal (2) Vertical		
	+		
MICRO-ORGANIZATIONAL CONTEXT	Unit Specialization		
	If	If	If
Task Variability	Low	Medium	High
Task Difficulty	Low-Med	Low-High	Med-High
	Then	Then	Then
MODULAR PATTERN OF UNIT OPERATING PROGRAM	SYSTEMATIZED	DISCRETIONARY	DEVELOPMENTAL
A. STRUCTURAL DIMENSION			
1. Role Specialization	High	Medium	Low-Medium
2. Standardization	High	Medium	Low
3. Discretion	Low-Medium	Low-High	Medium-High
4. Expertise	Low-Medium	Low-High	Medium-High
B. PROCESSES WITHIN UNIT			
1. Work Flow Direction	Sequential	Pooled	Reciprocal
2. Work Flow Frequency	High	Medium	Low
3. Direction of Communications	Vertical	Vert. & Hor.	Horizontal
4. Frequency of Communications	Low	Medium	High
PERFORMANCE		WILL RESULT IN	
A. Morale	Medium-High	Medium-High	Medium-High
B. Efficiency When Compared With Different Patterns in This Context	High	High	High
C. Efficiency When This Pattern is Found in Other Contexts	Low	Low	Low

the fundamental raw material of service organizations (Mills 1986). Service organizations are very well described as "information processing entities" (Galbraith 1973). The service organization tends to be small in size. As of 1986, over 60 percent of all service workers were employed in organizations with fewer than 100 employees (Mills 1986). The reasons for service organizations to be small in size are due to the intangibility of services and small start up cost and competitiveness of these firms (Mills 1986). Since services are intangible, they cannot be stored and must be delivered to the customer which limits the market of any individual firm. Since the output of a service organization is primarily information in the form of effort or performance, the start-up costs are small, which creates easy entry into the market place which makes the external environment dynamic and competitive (Mills 1986). Adding to the dynamic nature of service environments is the ease in which competitors can copy services rendered. It is postulated by Mills (1986) that small organizations are more adaptive to dynamic environments than large organizations.

An important and well known service organization assessment (design) model is Galbraith's Organizational Information Processing Model. Galbraith (1973) described organizations as information processing entities and explained how uncertainty and information relate to structure. Galbraith's theory is based on the premiss that variations in organizational form represent variations in the strategies of organizations to adapt to information processing requirements. The information processing requirements of an organization are related to the degree of task uncertainty. Galbraith defines task uncertainty as the difference between the amount of information required to coordinate cooperative action and the amount of information actually possessed by the organization. An increase in output diversity, division of labor, and/or level of performance will increase the amount of information required. An increase in any of these three will increase the number of factors that have to be considered simultaneously in order to reach decisions. If an organization does not posses the information, then it has to acquire it during the execution of a task. Thus Galbraith postulated, that a critical limiting factor of an organizational form is the capacity of the organization to process information and make decisions during the actual execution of a task.

Organizations need mechanisms that will coordinate the actions of large numbers of interdependent roles. Galbraith developed his propositions by looking at an organization as it goes from an environment of low task uncertainty to an environment of high task uncertainty. In an environment of low task uncertainty, an organization can preplan the actions of its interdependent roles through the mechanisms of rules, programs, and procedures. Integrated activity is guaranteed without additional communication between units or additional information collection and processing during task execution. When an organization encounters increased task uncertainty it faces situations that it has not faced before. Information must be collected and problems solved. Therefore, as the degree of task uncertainty increases, the number of exceptions increases, which in turn increases the amount of information that must be processed during task execution. The task uncertainty limits an organizations ability to make decisions about activities in advance of their execution. People in managerial roles perform the information collection and problem solving activities through an upward referral process. Through this upward referral process new responses to new situations are created. As highly uncertain tasks generated large numbers of exceptions, management quickly becomes overloaded. An organizational response to this management overload is to delegate decision making authority down to the working level where the information originates. This is done through increasing the discretion exercised by the employee. However, when the discretion exercised by the employee is increased, the organization may experience behavior control problems of its employees. In order to ensure appropriate behavior of its employees in this decentralized, empowered environment, the organization can substitute professional training for the centralized programming of the work processes. Another alternative to ensure appropriate behavior of its employees is to set goals. The setting of goals shifts control from control of behavior through rules and procedures to control of output through targets. As task uncertainty increases even more, the organization then must choose from among four strategies to deal with the increased uncertainty. Two of them reduce interdependence among the roles and reduce the need to process information, while two others create mechanisms to process more information. The strategies are as follows:

Strategy 1: The creation of slack resources, like duration of project, will reduce the level of performance. The lower performance will reduce the interdependence of roles and the need to consider a large number of decisions simultaneously.

Strategy 2: The creation of self-contained units, like project units, will reduce the division of labor and will reduce the need to process information about the sharing of resources among units. The reduced division of labor will reduce the need to coordinate roles and process information.

Strategy 3: The investment in vertical information systems will allow the organization to process more information by creating and expanding hierarchical channels of communication and increasing the capacity of decision making mechanisms.

Strategy 4: The creation of lateral relations will allow the organization to process more information by creating and expanding lateral channels of communication. Lateral relations include: direct contact between managers, liaison roles, task forces, teams, integrating roles, managerial linking roles, and matrix organizational design.

Zeithaml, Parasuraman, and Berry (1990) developed a "Conceptual Model of Service Quality" which identifies four gaps which they believe are the major causes of service quality shortfalls (See Figure 1). Closing these four gaps will close a fifth gap which is defined as service quality or the difference between expected service and perceived service. In their model, Gap 1 is the difference between customers' expectations and management's perceptions of those expectations. Management should have accurate perceptions of their customers' expectations if they are to meet or exceed those expectations. Therefore, the first step in improving the quality of service is for management to acquire accurate information about customer's expectations. Gap 2, in their model, is the difference between management's perceptions of customers' expectations and service quality specifications. Service standards should reflect customers' expectations if the service-delivery performance is to meet or exceed those expectations. Therefore, the second step in improving the quality of service is to set the performance standards to reflect the customers' expectations. Gap 3, is the difference between service quality specifications and service delivery. When the level of service-delivery performance falls short of service quality standards, it falls short of the customers' expectations. Therefore, the third step in improving the quality of service is ensuring that all the resources needed to achieve the standards are in place. Gap 4, is the difference between service delivery and external communications to customers about the service delivery. External communications to customers determine customer expectations. Therefore, the last step in improving the

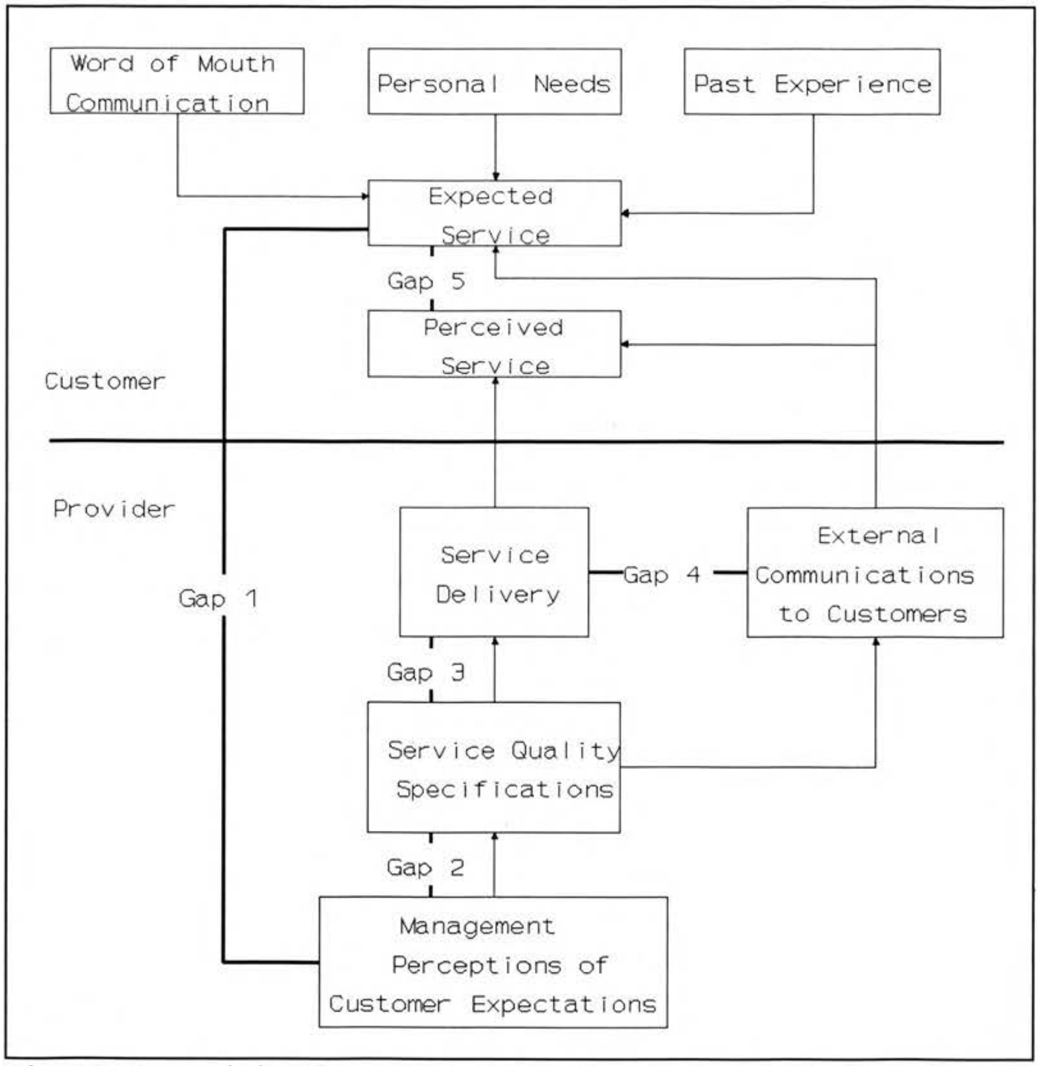


Figure 1 Zeithmal, Parasuraman, and Berry's (1990) Conceptual Model of Service Quality

quality of service is effectively coordinating actual service delivery with external communications.

Improving the quality of service is a continuous process of monitoring customers' perceptions of service quality, identifying the causes of service-quality shortfalls, and taking appropriate action to improve the quality of service. (Zeithaml, Parasuraman, and Berry 1990).

Other service organization assessment models that have been developed are as follows: Eiglier and Langeard's (1977), "The Service Business as a System" model; Aldrich and Herker's (1977), "Boundary Spanning Roles and Organizational Structure" model; Tushman and Nadler's (1978), "The Information Processing Model"; Mills and Moberg's (1982), "A Systems Model of the Service Production Process"; Chase and Tansik's (1983), "Customer Contact Model for Organizational Design"; Mills' (1983), "Model of Self-Management"; Mills, Chase, and Margulies' (1983), "Client/Employee Motivation Transaction Structure" model; Mills, Hall, Leidecker, and Margulies' (1983), "Flexiform Model"; Mills and Morris' (1986), "Client/Customer Participation Phases" model; and Mills' (1990), "Service Encounter: An Exchange Model".

f. <u>Organizational Assessment Model Used in This Study</u>. The model that was developed and used for this study is a hybrid of the organic-mechanistic model, Van de Ven's (1976) model, and Van de Ven and Ferry's (1980) model. It is shown in Table II.

The model contains, overall structural configuration (organizational size, and horizontal and vertical differentiation), nature of work undertaken (task difficulty and task variability), design of micro-organizational components (unit standardization, job codification, rule observation, participation in decision making, hierarchy of

Table II Model Used in This Study

MACRO-ORGANIZATIONAL CONTEXT	Structural Differentiation (1) Horizontal (2) Vertical	
	+	
MICRO-ORGANIZATIONAL CONTEXT	Unit Specialization	
	If	If
Task Variability Task Difficulty	Low	High
	Then	Then
MODULAR PATTERN OF UNIT OPERATING PROGRAM	MECHANISTIC	ORGANIC
A. STRUCTURAL DIMENSIONS		
1. Formalization	Formal	Informal
a. Unit Standardization	High	Low
b. Job Codification	High	Low
c. Rule Observation	High	Low
2. Centralization	Centralized	Decentralized
a. Participation in Decision Making	Low	High
b. Hierarchy of Authority	Low	High
c. External Hierarchy of Authority	High	Low
d. Employee Discretion	Low	High
e. Supervisory Discretion	Low	High
3. Complexity		
a. Role Interchangeability in the Unit	Low	High
b. Unit Skill Heterogeneity	Low	High
B. PROCESSES WITHIN UNIT		
1. Work Flow Interdependence	Independent	Team Work
2. Frequency of Communications	Low	High
PERFORMANCE	WILL RESULT IN	
C. Service Quality	High	High

authority, employee discretion, supervisory discretion, number of job titles in unit, role interchangeability in the unit, unit skill heterogeneity), processes within and between components (work flows and informational flows), and performance (service quality).

The hypotheses drawn from this model are stated in the section titled "Hypotheses Taken From Theory".

The constitutive and operational definitions of the constructs used in this model and their source are stated in the section titled "Definitions of Terms Used and How Response Scored".

g. Structural Contingency Management Paradigm, Alternate Forms of "Fit", and Previous Studies at the Work Unit Level of Analysis and Their Findings. Since Thompson (1967), the structural contingency management paradigm has dominated the study of organizational design and performance. The common underlying premiss of studies of organizational design and performance using the structural contingency management paradigm is that context and structure must somehow "fit" together if the organization is to perform well. In the development of theories using the structural contingency management paradigm at least three different conceptual approaches to "fit" have emerged: the selection, interaction, and systems approaches (Drazin and Van de Ven 1985). The form of "fit" used determines the type of relationship between variables, the form of the hypotheses, and the statistical and analytic techniques that are appropriate for testing.

The *simplest* approach to "fit" using the structural contingency management paradigm is the *selection approach*. Propositions using the selection approach are actually *congruent propositions* and not contingent propositions. Fit using the selection approach is defined as the congruence between context (e.g., environment, technology, or size) and structure (e.g., centralization, formalization, or complexity) (Drazin and Van de Ven 1985). The selection approach does not address the effect of the congruence of context and structure on a third variable: performance.

Hypotheses using the selection or congruence approach to fit in contingency theory take the form: "If U_1, then S". Congruent propositions are often referred to in literature as universalistic propositions. They are the main effects in factorial analysis of variance and assume that there is one best way to organize.

Congruence may be studied using simple regression to determine the relationship between an independent variable, such as task uncertainty, and a dependent variable, such as formalization. The coefficient of correlation (r) may be calculated as a relatively direct measure of the direction and degree, strength, or magnitude of the relation (Kerlinger 1986). Congruence or "fit" is confirmed when the coefficient of correlation (r) or regression coefficients (b) of context (environment, technology, or size) on structure (configuration, formalization, or centralization) are significant. The statistical significance of the regressions may be tested by calculating the p value of the correlation coefficients.

The selection approach was used by Hall (1962); Bell (1967a); Perrow (1967); Hage and Aiken (1969); Fullan (1970); Freeman (1973); Grimes and Klein (1973); Hrebiniak (1974); Van de Ven and Delbecq (1974); Comstock and Scott (1977); Nightingale and Toulouse (1977); Tushman (1977); Dewar and Hage (1978); Dewar and Werbel (1979); Pierce, Dunham, and Blackburn (1979); Marsh and Mannari (1981); Fry (1982); Van de Ven and Delbecq (1974); and Drazin and Van de Ven (1985).

Studies and their results which have been at the work unit level of analysis and have used the selection approach are as follows.

Bell's (1967a) study was at the work unit level of analysis. Bell (1967a) found a negative relationship between task variety and supervisor's span of control. When subordinates' jobs are highly complex, span of control is decreased. Similarly, when a supervisor's job is highly complex, span of control is decreased. Subordinates' and supervisors' job complexity were found to be positively related.

Grimes and Klein's (1973) study was at the individual and work unit level of analysis. They dichotomized their sample into unit task technology (individual) and modal technology (work unit level) to investigate how technology is related to the authority structure. They found little relationship between technology and structure at the work unit level of analysis, but found technology at both levels was highly related to the authority structure when decisions had to do with the task itself.

Hrebiniak's (1974) study was at the work unit level of analysis. Hrebiniak (1974) used three measures of technology - task predictability, task interdependence, and task manageability - and five measures of unit structure - job autonomy, participation, closeness of supervision, rule usage, and unity of control. He found that technology related to workgroup structure when the effects of supervision were controlled. Specifically, task manageability, which is conceptually similar to Perrow's (1967) concept of task variability, was negatively related to job autonomy, participation, and unity of control. Hrebiniak (1974) concluded that on the elimination of supervisory effects, technology may affect work unit structure to support the technological imperative, although the support is weak.

Van de Ven and Delbecq's (1974) study was at the work unit level of analysis. They used 120 workgroups within a large government employment-security agency to develop a taxonomy of design patterns that are a function of technology. They used two dimensions of technology - task difficulty and task variability - three programs for structuring work activities - systematized program, discretionary program, and developmental program - and three design patterns that they refer to as modes of control - systematized mode, service mode, and group mode. They concluded that the design patterns of workgroup structures are affected by task difficulty and task variability.

Specifically, they tested the congruence between task difficulty and the level of expertise required to solve problems, and the congruence between task variability and systematized, discretionary, and developmental programs of structuring work activities. They subsequently combined these two dimensions of technology and their corresponding effects (level of expertise and programs of structuring work activities) to suggest a taxonomy of design patterns.

The propositions tested in Van de Ven and Delbecq's (1974) study formed the basis for Van de Ven's (1976) model. Van de Ven's (1976) model was used as a basis for the model which was developed for this study.

Van de Ven and Delbecq (1974) tested the proposition that the greater the difficulty of tasks undertaken by a work unit, the greater the expertise required for solving problems (March and Simon 1958, Perrow 1967, Hage and Aiken 1969, and Van de Ven 1973). The greater expertise was reflected in (1) the educational level of unit personnel, (2) the prior education required as a qualification for job entry into the unit, (3) the continuing education required as a means of professional development and skill upgrading, and (4) the use of external consultants in decision making. Task difficulty may also affect other structural properties of a unit such as complexity (Hage 1965), participativeness in decision making

(Mohr 1971), and coordination (Van de Ven 1973), but were not tested.

Van de Ven and Delbecq (1974) also tested the proposition that task variability affects the extent to which work unit activities can be structured in a routinized, systemized, or mechanized way (Perrow 1967, Hage and Aiken 1969, Hall 1962, Litwak 1961, and Woodward 1965). They purported that task variability directly affects the mode of operating within a unit to structure work activities. As task variability goes from low, to medium, to high, work units will adopt a systematized, discretionary, and developmental program of structuring work activities respectively.

The systematized program for structuring work activities specifies in detail the means and ends for task performance to attain a high-volume, continuous, or large-batch output (Woodward 1965; Walker 1957; Mann and Hoffman 1960; Crozier 1964; Melman 1958; and Aitken 1960). The systematized program has (a) highly detailed work steps, and product or service specifications, (b) a high degree of pacing rules, and (c) many built-in quality control monitoring devices (Fullan 1970).

The discretionary program for structuring work activities specifies the outputs and includes a repertoire of means or processes to guide unit members in task performance (March and Simon 1958, p. 148). Members of such work units will analyze each task and apply the appropriate means to perform it

(McCorkel, Elias, and Boxby 1958: pp. 68-111; Marcson 1960; Perrow 1970).

The developmental program for structuring work activities specifies the general goals or ends for a work unit, but leaves unspecified the means to achieve them. The means-end connections for task performance cannot be specified in advance. The unit utilizing the development mode does not have a repertoire of processes to guide the members in task performance. Adaptation through problem solving and learning processes during the period of task performance is a distinctive feature of the developmental program (March and Simon 1958, p. 149, Thompson and Tudin 1959, Pelz and Andrews 1966, Delbecq and Van de Ven 1971).

Van de Van and Delbecq (1974) developed a taxonomy of work unit structures by combining the task difficulty and task variability dimensions. This taxonomy of work structures includes the design patterns that were used in Van de Ven (1976) model and consist of: the systematized mode, the discretionary mode, and the developmental mode. Van de Van and Delbecq refer to these design patterns as modes of control.

When work units perform tasks which are low in variability and low to medium in difficulty then the work units will be structured in a systematized mode. The systematized mode utilizes the systematized program for structuring work activities. Other descriptions of this type of structure are Burns and Stalker's (1961) mechanistic organization; Litwak's (1961) Type I model; Woodward's (1965) mass production organizations; Perrow's (1967) routine cells; Thompson's (1967) technical core; Grimes, Klein, and Shull's (1972) matrix model; and Mills and Margulies' (1980) maintenance-interactive mode. This type of structure exists where the state of knowledge about the means-end production or service processes are well known and the tasks performed by the units are relatively stable and require at most minor alterations in work methods or procedures for task performance (Fullan 1970, Harvey 1968, Walker and Guest 1952, Hall 1962, Mann and Hoffman 1960, Melman 1958, and Aitken 1960).

When work units perform tasks which are intermediate in variability and low to high in difficulty then the work units will be structured in a service mode. The service mode utilizes the discretionary program for structuring work activities. Relatively few theorists have identified the service mode as a unique structural type within complex organizations. Other descriptions which approximate this type of structure are Woodward's (1965) small-batch organizations, Reeves and Turner's (1972) small-batch organizations, Perrow's (1967) craft cells, and Mills and Margulies' (1980) task-interactive mode. The service mode is relatively flexible with alterations and substantial changes in work programs possible at less cost and less time than in the systematized mode.

When work units perform tasks which are so variable that they are novel and unique and medium to high in difficulty, the work units will be structured in a group mode. The group mode utilizes the developmental program for structuring work activities. The state of knowledge required to perform the tasks does not reside in one individual, so unit members are organized into teams. Team members are highly interdependent with the supervisor functioning as coordinator and facilitator. The structure is flexible and is adapted to the unique requirements of each task.

Comstock and Scott's (1977) study was at the work unit level of analysis. They used 142 patient care wards from 16 acute-care hospitals. They developed and tested the argument that technology should be thought of as representing the work of each level of organization as well as different subunits of an organization. Their technological construct consisted of task predictability (individual level) and workflow predictability (subunit level). They found support that task predictability affected staff characteristics whereas workflow predictability affected subunit coordination and control. Task predictability had no direct effect on subunit standardization; and workflow predictability did not affect either the qualifications or the specialization of staff members. They found that more predictable workflows increased the centralization of routine decisions and the setting of standards at the workgroup level. Task predictability was found to be negatively associated with centralization and staff differentiation. Unpredictable tasks reduced staff differentiation, but raised staff qualifications.

Dewar and Werbel's (1979) study was at the work unit level of analysis. They tested the universalistic (i.e., congruent proposition - there is one best way to organize) and contingent propositions on 52 departments from 13 consumer organizations. Conflict and satisfaction were the dependent variables. A universalistic finding was that formalization (specifying member's activities with rules and regulations) decreased satisfaction. Similarly, the enforcement of rules and regulations was associated with higher levels of conflict regardless of the routineness of the task.

Drazin and Van de Ven's (1985) study was at the work unit level of analysis. They used 629 employment security units in 60 offices located in California and Wisconsin in 1975 and 1978. They used the selection or congruence approach to test for natural selection (deterministic orientation) vs. managerial selection (voluntaristic orientation) (Van de Ven and Astley 1981) theories form-of-fit in contingency theory. This issue is important because the form-of-fit which was used in this study (deviation-score) assumes that the natural selection theory is valid.

Under the natural selection approach to fit, fit is the result of an evolutionary process that ensures that only the best performing units survive (McKelvey 1982). If natural selection is operating, then task uncertainty will correlate strongly with all work-unit structure and process variables (Drazin and Van de Ven 1985).

Under the managerial selection approach to fit, macro-level organizational units impose uniform practices and prescriptions on the more micro-level organizational units. These practices and prescriptions can be applied uniformly without regard for the context of the sub-unit or situationally through a set of switching rules that take contextual factors into consideration. If management selection is operating, then task uncertainty will correlate strongly with the work unit structure and process variables that are capable of being programmed at the macro-level such as specialization, standardization, personnel expertise, and written communication (Drazin and Van de Ven 1985). Drazin and Van de Ven (1985) found support for both the natural and managerial selection theories of forms-of-fit in contingency theory.

The *second* approach to "fit" using the structural contingency management paradigm is the *interaction approach.*

> "Interaction is the working together of two or more independent variables in their influence on a dependent variable. More precisely, interaction means that the operation or influence of one independent variable on a dependent variable depends on the level of another independent variable" (Kerlinger 1986, p. 230).

The interaction approach focuses on the interaction of organizational context and structure variables in explaining variation in organizational performance, such as service quality. Interactions with two independent variables are called first order interactions. Second order interactions (three independent variables) are possible with higher order interactions theoretically possible but unlikely and difficult to interpret (Kerlinger 1986).

Hypotheses using the interaction approach to fit in contingency theory take the following forms: If *S*, then *Q*, under condition U_1; or, Given U_1, if *S*, then *Q*. A few examples of the latter form are: 1) Given a high degree of task uncertainty (U_1), if the organizational structure (*S*) is made more organic, then service quality (*Q*) increases. 2) Given a high degree of task uncertainty (U_1), if the organizational structure (*S*) is made more mechanistic, then service quality (*Q*) decreases. 3) Given a low degree of task uncertainty (U_2), if the organizational structure (*S*) is made more organic, then service quality (*Q*) decreases. 4) Given a low degree of task uncertainty (U_2), if the organizational structure is made more mechanistic, then service quality (*Q*) increases. In these examples, task uncertainty is said to moderate the relationship between structure and service quality (Arnold 1982).

Interactions may be studied using simple regression, analysis of variance, factorial analysis of variance, and multiple regression.

"Factorial analysis of variance is the statistical method that analyzes the independent and interactive effects of two or more independent variables on a dependent variable"

(Kerlinger 1986, p. 228). With two independent variables, the linear model takes the form: $y = a_0 + A + B + AB + e$: where, y is the score of an individual on the dependent variable, a_0 is the term common to all individuals (the general mean), A is the effect of one independent variable, B is the effect of another independent variable, AB is the effect of both variables interacting, and e is error. A and B are called main effects and AB is called an interactive effect. There are three causes of significant interaction: true, error, and some extraneous, unwanted, uncontrolled effect operating at one level of the experiment and not another. The uncontrolled cause of interaction should be watched for in nonexperimental uses of analysis of variance where the independent variables have already operated. Another caution when using factorial analysis of variance in nonexperimental research is unequal *n*'s in the cells of the design. Unequal *n*'s in the cells of the design will cause problems with the orthogonality or independence of the independent variables. Factorial analysis of variance is best suited for experimental research in which subjects are randomly assigned to cells and the *n*'s are kept equal (Kerlinger 1986). Also, when the F ratios of both the main effects and interactions are statistically significant, interpretation of the effects is difficult. Despite the problems associated with the use of factorial analysis of variance in nonexperimental research, many of the past studies that use the interactive approach to fit in contingency theory use this form of analysis.

Multiple regression is the best analysis technique for nonexperimental research where the independent variables are not manipulated (Kerlinger 1986). Multiple regression with equal *n*'s and experimental variables yield exactly the same sums of squares, mean squares, and *F* ratios as the standard factorial analysis (Kerlinger 1986). With one independent variable, the multiple regression equation takes the form: $Q = A + B_{QS}S$: where B_{QS} indicates the amount of score difference in *Q* associated with a unit score change in variable *S*.

Even though both simple regression and multiple regression are used to study the interactions, Arnold (1982) points out that they provide information on different aspects of a relation. Arnold (1982) makes the distinction between the "degree" of a relation (*S*-*Q*) and the "form" of a relation (*S*-*Q*). The "degree" of a relation (*S*-*Q*) is measured by the magnitude of the correlation coefficient r_{SQ}. The "form" of a relation (*S*-*Q*) is measured by the regression coefficient B_{SQ} in a multiple regression equation: $Q = A + B_{SQ}S$.

If the "degree" of a relation varies across values of some third variable *U*, then *U* is said to "moderate the degree" of the *S*-*Q* relation. Information on the "degree" of the *S*-*Q* relation under the different conditions of *U* is indicated by the correlation coefficients of the *S*-*Q* relation under different conditions of *U*: (If *S*, then *Q*, under condition *U*) (Arnold 1982). The correlation coefficients will provide information on the direction and degree, strength, or magnitude of the *S*-*Q* relation under the different conditions of U (Arnold 1982; Kerlinger 1986). A comparison of correlation coefficients under the different conditions of U will answer the question, "Does S (organizational structure) account for as much of the variance in Q (service quality), under conditions of U_1 (high task uncertainty) as it does under conditions of U_2 (low task uncertainty)?" The square of the correlation coefficient r^2_{SQ} will provide information on the percentage of Q variance accounted for by S (Arnold 1982).

If the "form" of a relation varies across values of some third variable U, then U is said to "moderate the form" of the S-Q relation. Information on the "form" of the S-Q relation under the different conditions of U is indicated by the regression coefficient B_{SQ} in the multiple regression equation: $Q = A + B_{SQ}S$ (Arnold 1982). A comparison of the regression coefficients under the different conditions of U will answer the question, "Does a change in S (organizational structure) make the same amount of score difference in Q (service quality) in group U_1 (high task uncertainty) as it does in group U_2 (low task uncertainty)?" In this case, an interaction exists between the independent variable (S) and the moderator variable (U) in determining the dependent variable (Q). Or, in other words, the dependent variable (Q) is a joint function of the independent variable (S) and the moderator variable (U).

Arnold (1982) states that moderator variables moderate either one or both the degree and form of a relation. Arnold (1982) provides an example of a variable moderating the form but not the degree of a relation. His example is the calculation of the area of a rectangle where the area of the rectangle measured in square feet (*Y*) is equal to the length of the rectangle measured in feet (*X*) times the width of the rectangle measured in feet (*Z*): Area (*Y*) = Length (*X*) X Width (*Z*). In this example, the form of the relation between the area (*Y*) and the length (*X*) is conditional upon the width (*Z*). In other words, a change in the length (*X*) does not make the same amount of score difference in the area (*Y*) in a group of rectangles where the width (*Z*) is, say, 2 feet ($B_{YX} = 2$) as it does in a group of rectangles where the width (*Z*) is, say, 4 feet ($B_{YX} = 4$). Yet the degree of the relation between the area (*Y*) and the length (*X*) is not conditional upon the width (*Z*). In other words, the length (*X*) accounts for as much of the variance in the area (*Y*), in a group of rectangles where the width (*Z*) is, say, 2 feet ($r_{YX} = 1$) as it does in a group of rectangles where the width (*Z*) is, say, 4 feet ($r_{YX} = 1$).

If the *S-Q* relation is plotted under each condition of *U*, then information on the "degree" of the *S-Q* relation and the type (significant, not significant, ordinal, disordinal) of the *S-U* interaction may be obtained. The slope of the plotted line indicates the "degree" of the *S-Q* relation. If a line is diagonal (correlation coefficient = 1.0 or -1.0), then the "degree" of the *S-Q* relation is at its maximum. If a line is horizontal, then there is no *S-Q* relation. (See condition U_2 in d. of Figure 2) The extent to which the *S-Q* lines (one for each condition of *U*) are parallel indicates the extent of an

S-U interaction. If the *S-Q* lines are parallel, then there is no *S-U* interaction (See a. and b. of Figure 2). If the *S-Q* lines are not parallel but slope in the same direction, then there is an *S-U* interaction and it is called an ordinal interaction (See d. of Figure 2). If the *S-Q* lines are not parallel and slope in opposite directions, then there is an *S-U* interaction and it is called a disordinal interaction (See c. of Figure 2).

The interactive approach was used by Mohr (1971), Pennings (1975), Tushman (1977, 1978, 1979), Van de Ven and Drazin (1978), Schoonhoven (1981), Argote (1982), and Fry and Slocum (1984). Only Tushman (1979), Argote (1982), and Schoonhoven (1981) studies provided support for the interaction hypothesis.

Studies and their findings which have been at the work unit level of analysis and have used the interaction approach are as follows.

Schoonhoven's (1981) study was at the work unit level of analysis. She used 17 hospital operating rooms to test the relations between workflow uncertainty, structure, and effectiveness. She found that under conditions of high uncertainty, decentralization had a negative effect on severe morbidity, thus increasing effectiveness. When uncertainty was low, increased decentralization and destandardization resulted in lower effectiveness. She also found that increasing the level of professionalism had an undesirable

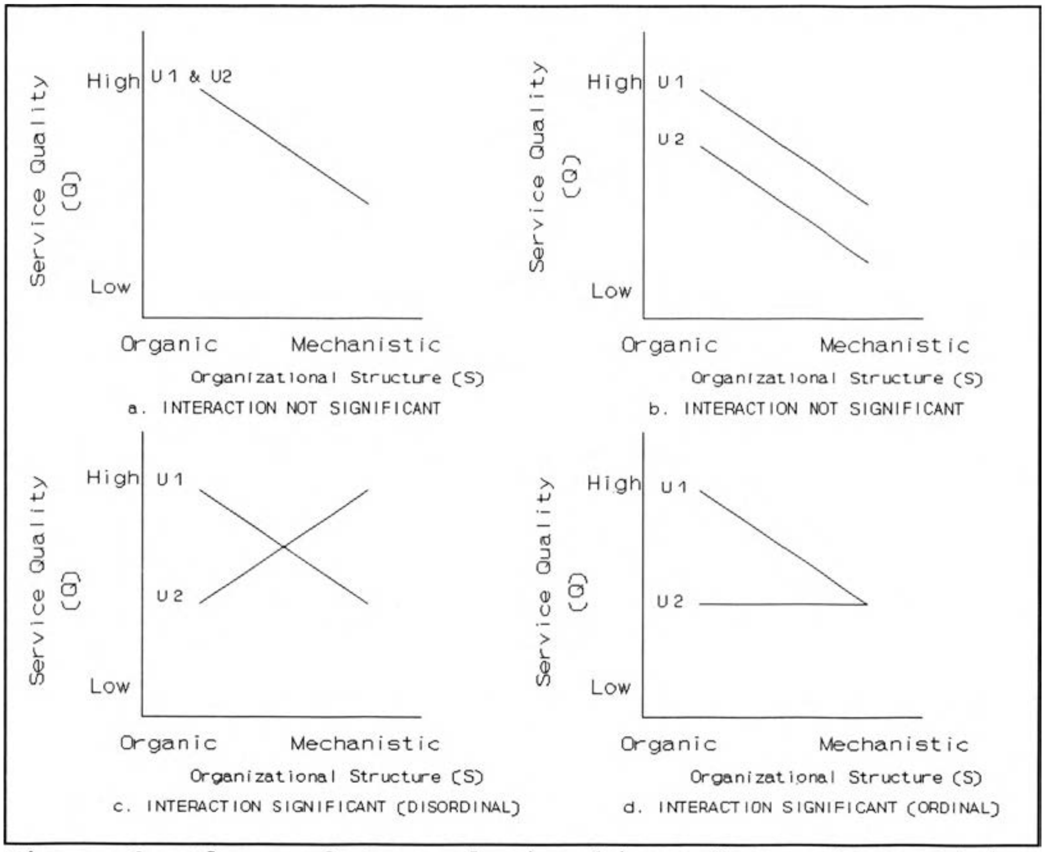


Figure 2 Plots of S-Q Relationship Under Each Condition of U Showing Degree of S-Q Relationship and Type of S-U Interaction

influence on effectiveness in those units faced with low amounts of workflow uncertainty.

Argote's (1982) study was also at the work unit level of analysis. She used 30 hospital emergency rooms to test the relations between input uncertainty, coordination mechanisms, and effectiveness. Argote (1982) found that programmed (rules, regulations, scheduled meetings) means of coordination made a greater contribution to organizational effectiveness under conditions of low input uncertainty than high input uncertainty. Conversely, nonprogrammed (general policies, mutual adjustments) means of coordination made a greater contribution to effectiveness when uncertainty was high than when it was low. The use of a particular mode of coordination can increase or decrease the effectiveness of the workgroup, depending on the degree of uncertainty encountered by nurses attending to patients.

With these mediocre results, researchers proposed a *deviation-score approach* for examining the interaction forms-of-fit in contingency theory. Using the deviation-score approach, "fit" is defined as the adherence or conformance of an organization's structure to an ideal, linear relationship between dimensions of context and structure (Drazin and Van de Ven 1985). If an organization's structure conforms to the ideal linear context-structure relationship, then performance will be high. If an organization's structure deviates from the ideal linear context-structure relationship, then performance will be low. This interpretation implies that there is a value of structure for each value of technology that will maximize effectiveness (Schoonhoven 1981). The function that meets this interpretation of "fit" is: $Y = (1) / \text{ABS VAL } (X_1 - X_2)$ (Schoonhoven 1981).

Hypotheses using the deviation-score approach to fit in contingency theory take the form: Given the value of variable 1 (task uncertainty), there is a matching value for variable 2 (structure) that produces the highest value of variable 3 (service quality). Deviations from this relationship in either direction reduces the value of variable 3 (service quality) (Schoonhoven 1981). A graphical representation of this example is shown in Figure 3 (In this example Organization B should have lower performance than Organization A).

Fit using the deviation-score approach may be studied using simple regression, analysis of variance, and multiple regression (Alexander and Randolph 1985; Drazin and Van de Ven 1985; Olson, Walker, and Ruekert 1995).

The deviation-score approach was used by Ferry (1979), Dewar and Werbel (1979), Miller (1981), Alexander and Randolph 1985, Drazin and Van de Ven (1985), and Olson, Walker, and Ruekert's (1995) and mentioned by Fry and Slocum (1984).

The analytic techniques and findings of studies which have been at the work unit level of analysis and have used the deviation-score approach are as follows.

Dewar and Werbel's (1979) study was at the work unit level of analysis. They tested the universalistic (congruent proposition - there is one best way to organize) and contingent propositions on 52 departments from 13 consumer organizations. Conflict and satisfaction were the dependent variables. They used simple and multiple regression in their analysis of "fit" using the deviation-score approach. Since a correlation between the context-structure residual and its components is possible when absolute values of the residuals are used, Dewar and Werbel (1979) used simple regression to test for this correlation. They found that their technology-formalization residuals were correlated with its components:

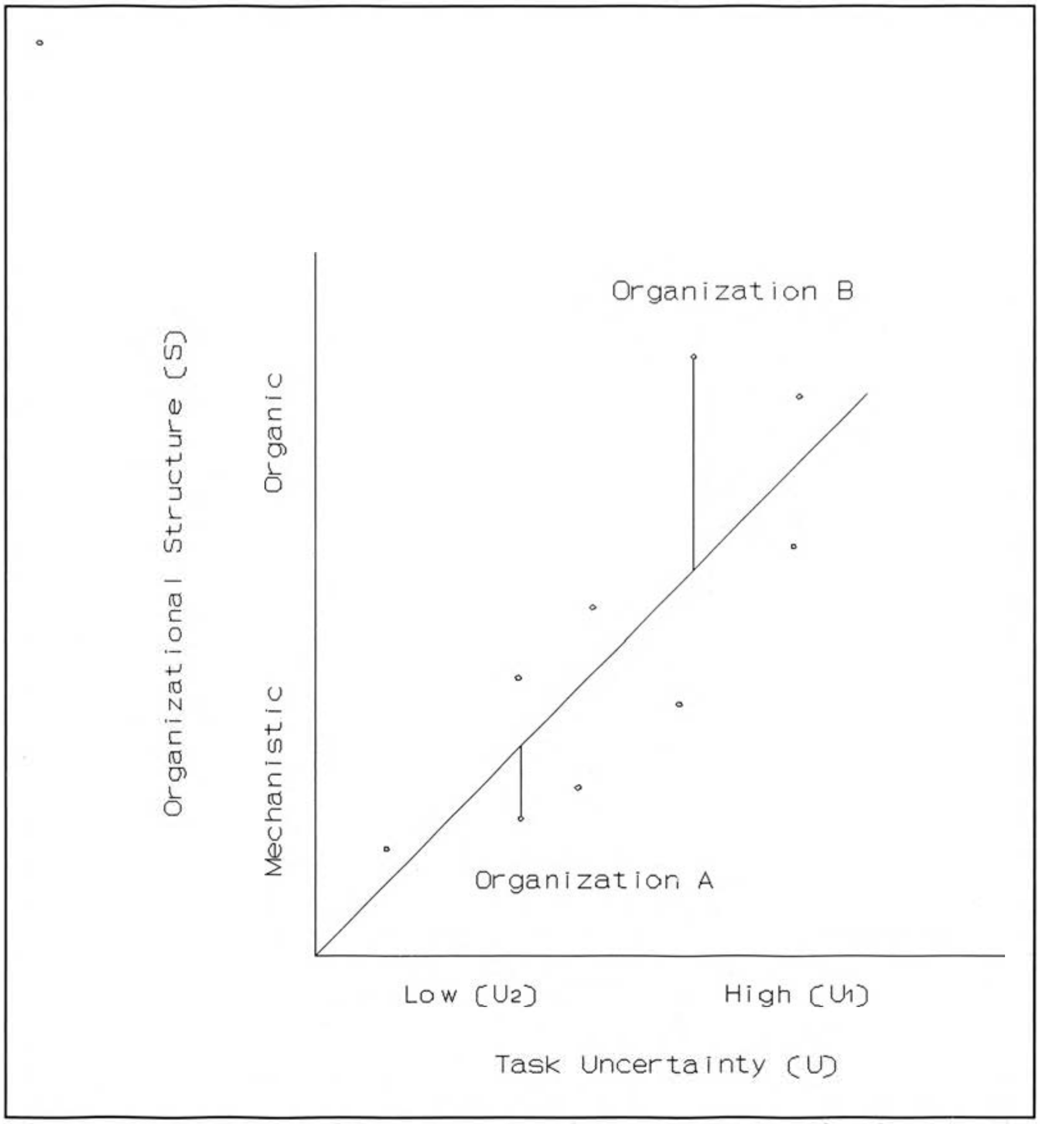


Figure 3 Graphical Representation of the Deviation-Score Approach for Examining the Interaction Form of Fit in Contingency Theory

technology and formalization. They used multiple regression, with context variables, structure variables, and context-structure residual variables regressed on satisfaction and conflict to test which independent variable had the largest effect on satisfaction and conflict. To test for the impact of the multicolinearity of the technology-formalization residuals with its components, they compared the regression coefficients *b* and multiple correlation coefficient R^2 of the multiple regression equations with and without the formalization and technology-formalization variables. The multicolinearity did not appear to seriously affect the interpretation of their results. They found that when mechanistic controls were used too frequently for the level of technological routineness, satisfaction declined. Frequent use of rules and regulations when work is routine led to a decline in satisfaction.

Alexander and Randolph's (1985) study was at the work unit level. They used 27 nursing subunits, in three hospitals in a southeastern city, to test the relationships between technology (instability (I), variability (V), and uncertainty (U)), structure (vertical participation (VP), horizontal participation (HP), and formalization (F)), fit (ABS VAL I-VP, ABS VAL V-HP, and ABS VAL U-F), and quality of nursing care. They used hierarchical regression for performance on technology and structure with three fit variables stepped in after the technology and structure variables. They found that relatively greater variability (V) matched with greater horizontal participation (HP) increased quality of nursing care. They also found that relatively greater uncertainty in technology matched with greater formalization (F) increased quality of nursing care. The second result appears to be inconsistent with Schoonhoven's (1981) and Argote's (1982) findings, but was explained due to the difference between Schoohoven's (1981) morbidity *outcome* measure and Alexander and Randolph's (1985) quality of care *process* measure. Their research supported their hypothesis that a simple measure of fit between technology and structure is a better predictor of quality of nursing care than either technology or structure alone, or the two together: the three fit variables by themselves yielded a higher R^2 than the six technology and structure did together (.50 vs. .35), or than the three technology variables did alone (.50 vs. .40).

Drazin and Van de Ven's (1985) study was at the work unit level of analysis. They used 629 employment security units in 60 offices located in California and Wisconsin in 1975 and 1978. They used simple regression and separately regressed eleven structure and process dimension deviation scores on efficiency and satisfaction. They proposed that if the correlations of the deviation scores with efficiency and satisfaction were significant and negative (the greater the deviation, the lower the performance), then the data was evidence of fit. Only 4 of the 22 possible relationships were significant and since all of the correlations were weak (the highest was only -.18) they concluded that the correlations were due to chance alone.

Olson, Walker, and Ruekert's (1995) study was at the work unit level of analysis. They used 45 projects from 12 firms in widely varying industries. They developed another approach of examining "fit" using the deviation-score approach that takes advantage of the direction of the residuals (too mechanistic or too organic) and alleviates the potential of multicolinearity of the context-structure residuals with their components. They divided their universe of occurrences (projects) into three equal groups: projects whose observations laid farthest above the regression line (too organic), projects whose observations laid closest to the regression line (fit), and projects whose observations laid farthest below the regression line (too mechanistic). Then they performed a one-way analysis of variance to identify whether the groups varied significantly on performance in the predicted direction.

Their findings indicated that the better the fit between the newness of the product concept and the participativeness of the coordination mechanism used, the better the outcomes of the development process in terms of (1) objective measures of product and team performance, (2) the attitudes of team members toward the process, and (3) the efficiency and timeliness of the new product development process.

A difficulty with the deviation-score approach is choosing the base-line context-structure relationship from which residuals are calculated. If this regression line does not represent high performing units then deviations from that line will not be meaningful. Drazin and Van de Ven (1985) used best-fitting least squares lines of each unit structure and process dimension on task uncertainty to establish their base-line context-structure relationship. Drazin and Van de

Ven (1985) found that using a group of high-performance units did not improve the results. Dewar and Werbel (1979) also used best-fitting least squares lines of their sample to establish their base-line context-structure relationships. This assumes that the residual lines are close to the normative prediction lines of the theory. In defense of their assumption they used the natural selection argument that an evolutionary process ensures that only the best performing units survive.

The *third* approach to "fit" using the structural contingency management paradigm is the *systems approach*. Fit using the systems approach is defined as a set of equally effective, internally consistent patterns of organizational context and structure (Van de Ven and Drazin 1985). Fit results in a pattern of structure and process that matches the contextual setting and is internally consistent. The organizational designer must select an organizational pattern and process that matches the contextual contingencies and develop structures and process that are internally consistent. This is a holistic approach that emphasizes the need to adopt a multivariate analysis to examine the patterns of consistency among dimensions of organizational context, structure, and performance (Miller 1981). In other words, the system approach uses latent variables for context, structure, and performance instead of observed variables and the analysis is performed at the latent variable level rather than the observed variable level. The system approach to fit in contingency theory is often referred to in literature as organizational gestalts and considers the effect of multiple and possibly conflicting contingencies on work-unit performance in order to have a more complete understanding of work-unit design (Gresov 1989; Gupta, Dirsmith, and Fogarty 1994).

The systems approach is similar to the deviation-score analysis. The deviation is not measured from a single linear equation line as it is in the deviation-score analysis, but as a distance from a profile described as a point in multi-dimensioned structure and process space. The greater the distance from the ideal profile, the lower the performance. The smaller the distance from the ideal profile, the higher the performance.

Hypotheses using the systems approach to fit in contingency theory may take the follow form: If U_1, then Q_1, under condition $S1_1$, $S2_1$, $S3_1$, $S4_1$, $P1_1$, $P2_1$, $P3_1$, $P4_1$; or, If U_1, $S1_1$, $S2_1$, $S3_1$, $S4_1$, $P1_1$, $P2_1$, $P3_1$, $P4_1$, then Q: where U is task uncertainty; Q is service quality; $S1$, $S2$, $S3$, and $S4$ are structural variables, and $P1$, $P2$, $P3$, and $P4$ are process variables. A few examples of the latter form are:

> "If the tasks delegated to a unit are low in variability and low to medium in difficulty, the more a unit adopts the modular pattern of a systematized program the higher the performance" (Van de Ven 1976, p. 74).

> "If the tasks delegated to a unit are medium in variability and range from low to high in difficulty, the more a unit adopts the modular pattern of a discretionary program the higher the performance" (Van de Ven 1976, p. 75).

> "If the tasks delegated to a unit are novel (*i.e., high in variability*) and medium to high in difficulty, the more a unit adopts the modular pattern of a developmental program the higher the performance" (Van de Ven 1976, p. 76).

Using the systems approach, "fit" is examined by correlating the distance from the ideal profile with a performance measure (Drazin and Van de Ven 1985). Fit would be demonstrated if the distance score was negatively correlated with the performance measure. The distance from the ideal profile may be calculated as follows: DIST = SQ RT (SUM(X*is* - X*js*) where X*is* is the score of the ideal unit on the *s*th structure or process dimension and where X*js* is the score of the *j*th unit on the *s*th structure or process dimension.

Khandwalla (1973), Alexander (1964), Gerwin (1976), Galbraith (1977), Nadler and Tushman (1980), Van de Ven and Ferry (1980), and Mills and Margulies (1980) all hypothesized that consistency among organizational design characteristics led to performance. The relations among latent context, structure, and performance constructs should be significant while the relations among the observed manifest variables need not be significant. This introduces the concept of equifinality, in terms of the observed organizational variables. Equifinality means that there are more ways than one of producing a given outcome. The challenge then is to learn how the observed variables substitute and trade off for each other, and how they, as a set, contribute to the abstract latent concepts of organizational context and structure. Using the systems approach, we search for equifinality in terms of the contributing effects of measured organizational features on latent system concepts and then examine the interactions among these latent concepts on organizational performance. In this way, the system approach preserves the essential argument in contingency theory. It is the researchers task to identify the feasible set of organizational designs that are equally effective for different context configurations and to understand which patterns of organizational designs are internally consistent and which patterns of organizational design that are internally inconsistent (Van de Ven and Drazin 1985).

The systems approach shares the same difficulty as the deviation-score approach in choosing the base from which residuals are calculated. The systems approach uses an ideal profile described as a point in multi-dimensioned structure and process space. If this ideal profile point does not represent high performing units, then deviations from that point will not be meaningful. Drazin and Van de Ven (1985) preselected high performing units under conditions of low, medium, and high task uncertainty in developing ideal profile points under each of those conditions. Drazin and Van de Ven's 1985 study is the only study to preselect high performing units to establish the ideal profile point. An alternative methodology to preselection is to use the natural selection argument and assume that a profile point which is calculated from the sample is the ideal profile point since the evolutionary process ensures that only the best performing units survive.

E. ADDITIONAL STUDIES AND THEIR FINDINGS

Many organizational design and performance studies have been performed using the structural contingency management paradigm. These studies have generally shown that as technology moves from routine to nonroutine, subunits adopt less formalized and centralized structures.

The environmental variable and it's relationship with organizational variables that has been the most studied is the technological construct. The technological construct is generally defined as the application of knowledge to perform work. It has also been commonly defined as the process of transforming inputs into outputs (Perrow 1967, 1970; Rousseau 1979). This definition of technology is consistent with an open system view (Katz and Kahn 1978).

Tables III and IV show there has been mixed results of the relationship between technology and organizational variables.

These mixed results are due partially to the fact that researchers have used different levels of analysis (individual, subunit, organizational) in measuring the structural variables and have used different phases of the conversion process (input, conversion, output) in measuring the technological construct (Gibson, Ivancevich, and Donnelly 1991; Alexander and Randolph, 1985; Rousseau 1979).

Table III Studies Supporting the Relationship Between Technology and Structure (N=16)

Study	Sample Composition
Woodward (1965)	100 Manufacturing
Bell (1967a)	30 Hospital departments
Hall, Haas, and Johnson (1967)	75 Mixed
Rushing (1968)	44 Manufacturing
Harvey (1968)	43 Manufacturing
Hage and Aiken (1969)	16 Health and welfare
Perrow (1970)	14 Manufacturing
Zwerman (1970)	55 Manufacturing
Fullan (1970)	12 Manufacturing
Freeman (1973)	41 Manufacturing
Keller, Slocum, and Susman (1974)	44 Manufacturing
Van de Ven and Delbecq (1974)	1 Government agency
Khandwalla (1974)	79 Manufacturing
Blau, Falbe, McKinley, and Tracy (1976)	110 Manufacturing
Comstock and Scott (1977)	16 Hospitals
Glisson (1978)	36 Health and welfare

a. supportive manufacturing= 10
b. supportive service=5
c. supportive mixed composition = 1

Source: Mills, Peter K. and Dennis J. Moberg. "Perspectives on the Technology of Service Operations" *Academy of Management Review* 7 no. 3 (Jul 1982): 468.

In addition, Fry (1982) attributed the mixed results of the relationship between technology and organizational variables to the confusion and overlap concerning the conceptualization of technology and structure, and the mixing of objective and perceptual operationalizations of technology and structural conceptions (Fry 1982; Ford 1979; Pennings 1973).

Table IV Studies Showing Little or no Support for a Technological-Structure Relationship (N=10)

Study	Sample Composition
Pugh, Hickson, Hinings, and Turner (1969)	46 Mixed
Hickson, Pugh, and Pheysey (1969)	16 Mixed
Inkson, Pugh, and Hickson (1970)	40 Mixed
Blau and Schoenherr (1971)	55 State agencies
Mohr (1971)	13 Health units
Aldrich (1972)	46 Mixed
Child and Mansfield (1972)	46 Mixed
Child (1973a)	82 Mixed
Hrebiniak (1974)	36 Hospital units
Reimann (1977)	19 Manufacturing

a. nonsupportive manufacturing = 1
b. nonsupportive service = 3
c. nonsupportive mixed = 6

Source: Mills, Peter K. and Dennis J. Moberg. "Perspectives on the Technology of Service Operations" *Academy of Management Review* 7 no. 3 (Jul 1982): 468.

Researchers have relied on two measurement approaches of organizational structure: objective (institutional) and subjective (questionnaire). Objective or institutional measures are characterized by obtaining information from organizational charts, personnel records, and other available documents, or through interviews with key informants (Ford

1979). Objective measures are most often used in organizational level studies (Fry 1982). Subjective or questionnaire measures are characterized by obtaining responses from a sample of organizational members to a questionnaire (Ford 1979). Subjective measures are most often used in individual and subunit level studies (Fry 1982). Pennings (1973) found low convergence between objective (institutional) and subjective (questionnaire) measures of organizational structure, suggesting that the measures were tapping different latent dimensions of structure. Sathe (1978) extended Pennings 1973 study and concluded that institutional and questionnaire measures cannot be used interchangeably since they apparently tap different structures: institutional measures tap the designed structure and the questionnaire measures tap emergent structures. Ford (1979) speculated that Sathe and Pennings did not obtain convergence between objective (institutional) and subjective (questionnaire) measures of organizational structure because they did not control for such context factors as size, technology, and environment. Ford (1979) found greater convergence between objective (institutional) and subjective (questionnaire) measures of formalization, centralization, and differentiation when the size, technology, and environment were controlled. However, since the convergence was still low (.19 absolute value), Ford speculated that his results were consistent with Sathe's argument: that the respective measure may be tapping conceptually distinct structures (Ford 1979).

Ford (1979) speculated however that other factors, such as leadership and type of organizational control, need to be considered before the extent to which institutional and questionnaire measures tap different structures could be ascertained. Ford (1979) pointed out that a leader may enact a structure (emergent) that is different from the designed structure in order to cope with contextual factors that were not seen by those who implemented the designed structure. The extent to which a leader enacts a structure which is different from the designed structure, will determine the extent to which institutional and questionnaire measures diverge. Ford (1979) also pointed out that there are two organizational modes of control as purported by Ouchi and Maguire (1975): output (impersonal) or behavioral (personal). Output control is based on the measurement of outputs and occurs when goals are agreed upon, but means-end relationships are not well understood and legitimate evidence of performance is needed. Behavioral control is based on direct, personal surveillance and occurs when means-end relationships are well understood and appropriate instructions are needed and possible to provide (Ouchi and Maguire 1975). Under output control, emphasis is placed on the consequence of action (output) and not the action itself (behavior, process, or method). Under the behavioral control mode, emphasis is placed on the action taken (behavior, process or method) to produce some output. Ford (1979) suggested that, since the action (behavior, process, or method) is emphasized or controlled when the behavioral mode of control is used, there will be greater convergence between the designed and emergent structures (and correspondingly between the institutional and questionnaire measures). Ford (1979) also suggested that, since the action (behavior, process, or method) is not emphasized or controlled when the output mode of control is used, there will be divergence between the designed and emergent structures (and correspondingly between the institutional and questionnaire measures).

Manning (1977) found that the emergent structure will diverge from the designed structure when tasks require individual discretion and allow for greater individual control over task relevant information.

Objective (institutional) measures may be biased because the phenomena under study may be misperceived or misrepresented by informants or records (Fry 1982). Subjective (questionnaire) measures may be subject to aggregation bias. The underlying issue behind aggregation bias is the degree to which properties or perceptions of individuals hold true for groups and organizations comprised of these individuals, and the extent to which one can make inferences from one level to higher levels (Van de Ven and Ferry 1980). The potential for aggregation bias occurs when aggregating individual level data (through mean scores) which have a wide within-unit variance. If the within-unit variance is higher than the between-unit variance, then it is inappropriate to aggregate such measures to the subunit level.

A one-way analysis of variance can test for this situation. A significant F-test would indicate that the between-unit variance is greater than the within-unit variance and indicate that aggregation is a proper procedure for deriving subunit technology scores from individual level data. Aggregation bias will cause correlations using the aggregated data to be different form correlations computed from the individual level data (Fry 1982).

Problems may also arise when using "organizational level of analysis" due to the assumption that the organizations comprising their samples have a single dominant technology (Fry 1982). It has been shown however that subunits of complex organizations use diverse technologies (Comstock and Scott 1977; Overton, Schneck, and Hazlett 1977).

Ford and Slocum (1977) found a correlation between nonroutine technologies, uncertain environments, and small size and organic structures; and routine technologies, certain environments, and large size and mechanistic structures regardless of whether institutional or questionnaire measures were employed.

Fry (1982) categorized the conceptions of the technological construct used in research literature between 1965 and 1982 into six categories: technical complexity (Woodward 1965); operations technology and operations variability (Pugh, Hickson, Hining, and Turner 1969; Hickson, Pugh, and Pheysey 1969); interdependence (Thompson 1967);

routine-nonroutine (Perrow 1967, 1970); manageability of raw material (Mohr 1971).

Fry's rationale for classifying the technological construct was to trace the citations back to one of the above citations or identify similarity of meaning between the authors' meaning and one of Fry's six categories. Often authors use different labels for constructs which have the same conceptual underpinnings. The purpose of Fry's 1982 study was to empirically examine the extent to which the use of different conceptions of technology and structure, different levels of analysis, and different measures has influenced findings in research on technology-structure relationships. He found that the use of different conceptions of the technology construct and different level of analysis both cause confusion and lack of consensus in the area of organizational research. He found that the studies using the "operations technology" concept of technology and "individual level of analysis" ran the most counter to the overall population results. He concluded that once the studies using the "operations technology" concept of technology and "individual level" studies are taken out of consideration, then there is empirical support for a technology-structure relationship. Fry (1982) suggested that the reason that studies using the "individual level of analysis" ran contrary to much of the research in this area was due to errors in correlations due to homogeneous grouping. This results in correlations between variables to be larger for aggregates than individuals and can be corrected by properly categorizing individuals before data analysis. Fry (1982) suggested that the "operations technology" concept of technology, which was used in the Aston group research, was conceptualizing or measuring a narrow view of technology making the results different from other research in this area. Fry (1982) also found: a lack of influence of objective verses subjective operationalizations on research results; consistent curvilinear results using the "technical complexity" concept of technology; consistent findings using "routine-nonroutine" concept of technology; and the importance of "interdependence" as a technology variable.

Contingency theory's ideas on formalization and centralization are: as technology moves from routine to nonroutine, subunits adopt less formalized and centralized structure.

Most studies of technology and structure have assumed that an organization's structure is dependent on the technology; that is, an organization is designed to fit its technology. Glisson (1978) proposed a model for human service organizations that closed the loop on this thinking by purporting that technology is, in turn, dependent on an organization's structure. Glisson (1978) used Perrow's (1967) definition of technology and structure as, "an individual's direct action on some raw material in an attempt to change it and structure as an individual's interaction with coworkers". Glisson (1978) viewed human beings as the raw material of human service organization's and viewed the organization's purpose as attempting to produce cognitive, affective, or behavioral changes in its customers. He proposed that human service technologies are susceptible to organizational influences because of the variability of the raw material (human beings), the heterogeneity of interventive efforts to change the human beings, and low predictability of outcomes (cause-effect relationships). His model proposed that,

> "Management's perceptions of the raw material affect: (1) management's perception of the required technology which determines (2) management's perception of the required organizational structure which affects (3) the implementation of certain structural dimensions which, in turn, affect (4) individual workers' perceptions of the raw material and their actions on it."

In other words, if a human service worker operated in a highly centralized and formalized structural environment where the individual worker's discretion was discouraged, then the worker would begin to view clients as uniform; encounter few exceptions; and deal with problems systematically and repetitively. Glisson proposed that the structural variables of worker's participation in decision making, division of labor, and procedural specification are means by which management controls the organization by limiting the exercise of discretion in worker interaction. Blau (1960) also studied the effects of organizational constrains on human service technology. Blau (1960) found that workers tended to modify their approach to clients in response to sanctioning patterns of their work group.

Glisson (1978) found that the structural dimensions of division of labor and procedural specifications did have significant direct effects upon the technology used (routinization).

F. HYPOTHESES TAKEN FROM THEORY

The following hypotheses are based on the organizational assessment model that was developed for this study and shown on page 56. The form of these hypotheses are for congruent, interaction, and deviation-score approaches to fit in contingency theory. Hypotheses one through eleven involve the relations between a work unit's work task uncertainty (task difficulty and task variability), either one of twelve structural dimensions (unit standardization; job codification; rule observation; participation in decision making; supervisor, unit employee, and collegial hierarchy of authority; external hierarchy of authority and; employee and supervisory discretion, role interchangeability in the unit, or unit skill heterogeneity) or one of two process dimensions (work flow interdependence within unit, or unit communications) and service quality. Hypothesis twelve involves the relation between a work unit's work task uncertainty (task difficulty and task variability), an overall organic-mechanistic dimension, and service quality.

In determining which dimension of task uncertainty (difficulty and/or variability) should correlate with each structural or process dimension, the following may be used.

Task difficulty consists of two dimensions: analyzability and predictability of the work encountered. These dimensions affect the amount of expertise and discretion needed to perform a task (Bell 1967; and Hage 1965). As such, task difficulty should correlate with participation in decision making, hierarchy of authority, discretion, role interchangeability in the unit, unit skill heterogeneity, work flow interdependence within unit, and unit communications.

Task variability affects the degree to which work processes can be structured in a routinized, systematized, or mechanized way (Hall 1962; Litwak 1961; Perrow 1967; and Woodward 1965). As such, task variability should correlate with unit standardization, job codification, and rule observation.

The congruent hypotheses are based on existing theory. Testing the deviation-score hypotheses is the focus of this research.

1. Relation Between Task Uncertainty, Unit Standardization, and Service Quality. The relation between task uncertainty of a unit's work, unit standardization, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 1. If the work of an organizational unit increases in task uncertainty (*U*), then there is a decrease unit standardization (*S*) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $-1 < r_{US} < 0$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 1. Given a value of task uncertainty, there is a matching value for unit standardization that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) < Mean (Work Units Closest to Regression Line) < Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

2. Relation Between Task Uncertainty, Job Codification, and Service Quality. The relation between task uncertainty, job codification, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 2. If the work of an organizational unit increases in task uncertainty (U), then there is a decrease in job codification (S) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $-1 < r_{US} < 0$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 2. Given a value of task uncertainty, there is a matching value for job codification that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) < Mean (Work Units Closest to Regression Line) < Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

3. Relation Between Task Uncertainty, Rule Observation, and Service Quality. The relation between task uncertainty, rule observation, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 3. If the work of an organizational unit increases in task uncertainty (*U*), then there is a decrease in rule observation (*S*) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $-1 < r_{US} < 0$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 3. Given a value of task uncertainty, there is a matching value for rule observation that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) < Mean (Work Units Closest to Regression Line) < Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

4. Relation Between Task Uncertainty, Participation in Decision Making, and Service Quality. The relation between task uncertainty, participation in decision making, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 4. If the work of an organizational unit increases in task uncertainty (*U*), then there is an increase in participation in decision making (*S*) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 4. Given a value of task uncertainty, there is a matching value for participation in decision making that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

5. Relation Between Task Uncertainty; Supervisor, Unit Employee, and Collegial Hierarchy of Authority; and Service Quality. The relation between task uncertainty; supervisor, unit employee, and collegial hierarchy of authority; and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 5. If the work of an organizational unit increases in task uncertainty (U), then there is an increase in supervisor, unit employee, and collegial hierarchy of authority (S) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 5. Given a value of task uncertainty, there is a matching value for supervisor, unit employee, and collegial hierarchy of authority that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

6. Relation Between Task Uncertainty, External Hierarchy of Authority, and Service Quality. The relation between task uncertainty, external hierarchy of authority, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 6. If the work of an organizational unit increases in task uncertainty (U), then there is a decrease in external hierarchy of authority (S) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $-1 < r_{US} < 0$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 6. Given a value of task uncertainty, there is a matching value for external hierarchy of authority that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) < Mean (Work Units Closest to Regression Line) < Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

7. Relation Between Task Uncertainty, Employee and Supervisory Discretion, and Service Quality. The relation between task uncertainty, employee and supervisory discretion, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 7. If the work of an organizational unit increases in task uncertainty (U), then there is an increase in employee and supervisory discretion (S) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 7. Given a value of task uncertainty, there is a matching value for employee and supervisory discretion that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

8. Relation Between Task Uncertainty, Role Interchangeability in the Unit, and Service Quality. The relation between task uncertainty, role interchangeability in the unit, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 8. If the work of an organizational unit increases in task uncertainty (*U*), then there is an increase in role interchangeability in the unit (*S*) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. <u>Deviation-Score Hypothesis 8</u>. Given a value of task uncertainty, there is a matching value for role interchangeability in the unit that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

9. <u>Relation Between Task Uncertainty, Unit Skill Heterogeneity, and Service Quality</u>. The relation between task uncertainty, unit skill heterogeneity, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. <u>Congruence Hypothesis 9</u>. If the work of an organizational unit increases in task uncertainty (U), then there is an increase in unit skill heterogeneity (S) (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$.

H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 9. Given a value of task uncertainty, there is a matching value for unit skill heterogeneity that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

10. Relation Between Task Uncertainty, Work Flow Interdependence Within Unit, and Service Quality. The relation between task uncertainty, work flow interdependence within unit, and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 10. If the work of an organizational unit increases in task uncertainty (*U*), then there is an increase in work flow interdependence within the unit (*P*) (more organic): independent work flow, to sequential work flow, to reciprocal work flow, to team work flow. Statistical Hypothesis: H_0: $r_{UP} = 0$.

H_1: $0 < r_{UP} < 1$: r_{UP} is significant ($p < 0.05$).

b. <u>Deviation-Score Hypothesis 10</u>. Given a value of task uncertainty, there is a matching value for work flow interdependence within the unit that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

11. <u>Relation Between Task Uncertainty, Unit Communications (Information Flows), and Service Quality</u>. The relation between task uncertainty, unit communications (information flows), and service quality using the congruence and deviation-score forms of fit in contingency theory are as follows:

a. <u>Congruence Hypothesis 11</u>. If the work of an organizational unit increases in task uncertainty (*U*), then there is an increase in frequency of information flows of all kinds: among unit personnel written reports and memos, one-on-one discussions, and group meetings (*P*) (more organic). Statistical Hypothesis: H_0: $r_{UP} = 0$.

H_1: $0 < r_{UP} < 1$: r_{UP} is significant ($p < 0.05$).

b. Deviation-Score Hypothesis 11. Given a value of task uncertainty, there is a matching value for unit communications (information flows) that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

12. Relation Between Task Uncertainty, the Overall Unit Structure and Process Dimension (Mechanistic-Organic Scale), and Service Quality. The relation between the task uncertainty of a unit's work, the overall unit structure and process dimension (mechanistic-organic scale), and service

quality using the congruence, interaction, and deviation-score forms of fit in contingency theory are as follows:

a. Congruence Hypothesis 12. If the work of an organizational unit increases in task uncertainty, then there is an increase in the organic nature of its structure and processes (more organic). Statistical Hypothesis: H_0: $r_{US} = 0$. H_1: $0 < r_{US} < 1$: r_{US} is significant ($p < 0.05$).

b. Interaction Hypothesis 12. (a) If a work unit is in an environment of high task uncertainty and is structured organically, then its customers will perceive services the same as their desired service level. (b) If a work unit is in an environment of high task uncertainty and is structured mechanistically, then its customers will perceive services lower than their desired service level. (c) If a work unit is in an environment of low task uncertainty and is structured mechanistically, then its customers will perceive services the same as their desired service level. (d) If a work unit is in an environment of low task uncertainty and is structured organically, then its customers will perceive services higher than their desired service level. The following are the testable terms of the interaction hypotheses. They were derive by adding and/or subtracting two times the standard error of the means to the means of the CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ unit means.

12a) High Task Uncertainty with an Organic Structure:

	Expected
CSSERVQ:	$5.8992 < M < 6.3842$
CSSERVWT:	$5.8569 < M < 6.3764$
SERVQUAL:	$6.1074 < M < 6.7296$
OVERALSQ	$5.8497 < M < 6.4151$

12b) High Task Uncertainty with a Mechanistic Structure:

	Expected
CSSERVQ:	$M < 5.8992$
CSSERVWT:	$M < 5.8569$
SERVQUAL:	$M < 6.1074$
OVERALSQ	$M < 5.8497$

12c) Low Task Uncertainty with a Mechanistic Structure:

	Expected
CSSERVQ:	$5.8992 < M < 6.3842$
CSSERVWT:	$5.8569 < M < 6.3764$
SERVQUAL:	$6.1074 < M < 6.7296$
OVERALSQ	$5.8497 < M < 6.4151$

12d) Low Task Uncertainty with an Organic Structure:

	Expected
CSSERVQ:	$M > 6.3842$
CSSERVWT:	$M > 6.3764$
SERVQUAL:	$M > 6.7296$
OVERALSQ	$M > 6.4151$

Note: M = Mean of Service Quality Variable

c. Deviation-Score Hypothesis 12. Given a value of task uncertainty (difficulty and variability) of a unit's work, there is a matching value for the overall unit structure and process dimension (mechanistic-organic scale) that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Statistical Hypothesis:

H_0: Mean (Work Units Above Regression Line) = Mean (Work Units Closest to Regression Line) = Mean (Work Units Below Regression Line).

H_1: Mean (Work Units Above Regression Line) > Mean (Work Units Closest to Regression Line) > Mean (Work Units Below Regression Line). F is significant ($p < 0.05$).

Note: Mean = Mean of Service Quality Variable

II. METHOD

A. OVERVIEW OF RESEARCH DESIGN AND METHOD(S) USED

This study is nonexperimental, social science research. It is a hypothesis-testing field study, aimed at discovering the relations and interactions among social and psychological variables in a real social setting. The unit of analysis is the organizational work unit.

Data for this research were obtained from a two-part mail survey. The Part I was administered to members of lower level work units within the U.S. Army Corps of Engineers, St. Louis District, with data obtained on work unit context, structure, and processes. The survey recipients were asked to provide the names of individuals, within the St. Louis District, who have used the services of their work unit within the preceding three months. These individuals are the *internal* customers. Part II was administered to those *internal* customers with data obtained on perceived service quality. The data were then analyzed for the hypothesized correlations.

1. Who Participated. Employees of the U.S. Army Corps of Engineers, St. Louis District participated in the study.

a. Description of Subjects. The majority of the subjects are career Federal employees providing planning, engineering, construction, operations and maintenance, and support services to Federal, State, and Local government entities.

b. How Subjects Were Selected. The subjects who provided data on work unit context, structure, and process variables were selected based on where they worked in the organization. All employees, who were located in units which are at the lowest level of the organizational structure, were selected. See Appendix A for the units that were selected for testing.

The subjects, who provided data on the service quality variable for the work units, were individuals who were identified by the unit supervisors and unit members as having been an "internal" customer of the work unit within the last three months. Internal customers are employees of a company which are exterior to a work unit that is providing the service.

c. Where Data Were Gathered From Subjects. The data were gathered from employees of the U.S. Army Corps of Engineers, St. Louis District, 1222 Spruce Street, St. Louis Missouri, 63103.

d. When Data Were Gathered From Subjects. Data on the context, structure, process, and service quality indices were obtained from unit supervisors, unit members, and unit customers from December 1995 through February 1996.

2. What Was Used to Gather Data. Data on the context, structure, and process indices were obtained by two different questionnaires: one for the unit supervisor and one for the unit members (Part I).

Data on the service quality indices were obtained by a third questionnaire which was administered to customers of the work units (Part II).

a. <u>How Data Were Gathered</u>. The data were gathered by a two-part, mailed, on-site survey. Part I obtained context, structure, and process data from unit supervisors and unit members. Four hundred seventy, Part I surveys were mailed out (50 supervisor surveys and 420 employee surveys). Two hundred twenty-nine, Part I surveys were returned (39 supervisor surveys and 190 employee surveys). This is a return rate of 40.8 percent. Twenty-seven of those non-returns were due to retirements or relocations. Part II obtained service quality data from customers of the work units. Three hundred nine, Part II surveys were mailed out. Two hundred six, Part II surveys were returned. This is a return rate of 66.7 percent.

b. <u>Definitions of Terms Used and How Response Scored</u>. The unit of analysis in this study is the work unit.
Work unit scores for the context, structure, and process variables were obtained by assigning equal weights to questionnaire responses from the unit supervisor (1/2) and unit members (1/2). This procedure was used by Hage and Aiken (1967, p. 76-77) and Van de Ven and Ferry (1980, p. 173). This aggregation procedure is theoretically justified because the work unit consists of two hierarchically related positions: a supervisor and his/her subordinates. The supervisor and subordinates are likely to hold different

perspectives of the organization since they occupy different social positions (Van de Ven and Ferry 1980).

The constitutive and operational definitions and the procedure for scoring the unit supervisor, unit member, and customer questionnaire responses for the context, structure, process, and service quality variables are as follows (See Appendix B for the values of these calculated variables for work units).

CONTEXT/TECHNOLOGICAL VARIABLES

TASK UNCERTAINTY (TASKUNCR & CSTASKUN) - Task uncertainty is a technological construct. The concept of task uncertainty refers to the nature of the work that a work unit performs. It consist of and is measured by two dimensions: TASK DIFFICULTY and TASK VARIABILITY. Task uncertainty was measured by the unit supervisors and unit members (TASKUNCR), and the internal customers (CSTASKUN).

TASK DIFFICULTY (TASKDIF & CSTSDIF) - "Task difficulty is defined by two conceptually distinct terms, the *analyzability* and *predictability* of the work undertaken by an organizational unit." "The *analyzability* of work is the ease and clarity of knowing the nature and order of tasks to be performed. The *predictability* of the work is the ease with which one can determine in advance what the outcomes of a particular sequence of task steps will be" (Van de Ven and Ferry 1980, p. 159).

The following operational definition of task difficulty was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of task difficulty for the unit supervisor, unit member, and internal customer was based on the four questions which are stated in Table V (the questions were in the third person for the internal customer questionnaire).

Table V Task Difficulty Questions for Unit Supervisor, Unit Member, and Internal Customer

1. *How easy* is it for *you* to *know* whether you do your work correctly?

VERY DIFFICULT	QUITE DIFFICULT	SOMEWHAT EASY	QUITE EASY	VERY EASY
1	2	3	4	5

2. *What percent of the time* are you *generally sure* of what the *outcomes* of your work efforts will be?

40% OR LESS	41-60%	61-75%	76-90%	91% OR MORE
1	2	3	4	5

3. In the past three months, *how often* did difficult problems arise in your work for which there were no immediate or apparent solutions?

ONCE A WEEK OR LESS	ABOUT 2-4 TIMES A WEEK	ABOUT ONCE A DAY	ABOUT 2-4 TIMES A DAY	5 TIMES OR MORE A DAY
1	2	3	4	5

4. About *how much time* did you spend solving these *difficult problems*?

LESS THAN 1 HOUR/WEEK	ABOUT 1-4 HOURS/WEEK	ABOUT 1 HOUR/DAY	ABOUT 2-3 HOURS/DAY	4 HOURS OR MORE PER DAY
1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2) (TASKDIF). The responses to questions 1 and 2 were reverse ordered. Task difficulty was also measured by internal customers (CSTSDIF).

TASK VARIABILITY (TASKVAR & CSTSVAR) - "Task variability is defined as the number of exceptions encountered in the characteristics of the work" (Van de Van and Ferry 1980, p. 160).

The following operational definition of task variability was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of task variability for the unit supervisor, unit member, and internal customer was based on the four questions which are stated in Table VI (the questions were in the third person for the internal customer questionnaire).

Table VI Task Variability Questions for Unit Supervisor, Unit Member, and Internal Customer

1. *To what extent* do you perform the *same tasks* from day to day?

ALMOST ALL MY TASKS ARE THE SAME DAY-TO-DAY	MANY OF MY TASKS ARE THE SAME DAY-TO-DAY	ABOUT HALF OF MY TASKS ARE THE SAME DAY-TO-DAY	SOME OF MY TASKS ARE THE SAME DAY-TO-DAY	ALMOST NO TASKS ARE THE SAME DAY-TO-DAY
1	2	3	4	5

Table VI Task Variability Questions for Unit Supervisor, Unit Member, and Internal Customer (Continued)

2. *How much the same* are the day-to-day situations, problems, or issues you encounter in performing your major tasks?

VERY MUCH THE SAME	MOSTLY THE SAME	QUITE A BIT DIFFERENT	VERY MUCH DIFFERENT	COMPLETELY DIFFERENT
1	2	3	4	5

3. During a normal week, *how frequently* do *exceptions arise* in your work which require *substantially different* methods or procedures for doing it?

VERY RARELY	OCCASIONALLY	QUITE OFTEN	VERY OFTEN	CONSTANTLY
1	2	3	4	5

4. *How often* do you follow about the *same work methods or steps* for *doing* your major tasks from *day to day*?

VERY SELDOM	SOMETIMES	ABOUT HALF THE TIME	QUITE OFTEN	VERY OFTEN
1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2) (TASKVAR). The responses to question 4 were reverse ordered. Task variability was also measured by the internal customers (CSTSVAR).

STRUCTURAL VARIABLES

DEGREE OF FORMALIZATION (DEGRFORM) - The concept of formalization refers to the extent to which the expectations of ends and means of work are specified and written. The degree of formalization is measured in three ways: UNIT STANDARDIZATION, JOB CODIFICATION, and RULE OBSERVATION.

UNIT STANDARDIZATION (UNTSTD) - "Unit standardization is defined as the extent to which rules, standard operating procedures, and performance expectations are formalized and followed to coordinate, control, and evaluate unit activities" (Van de Ven and Ferry 1980, p. 398).

The following operational definition of unit standardization was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of unit standardization for the unit member was based on the four questions which are stated in Table VII.

Table VII Unit Standardization Questions for Unit Member

1. Overall, *how clearly* have specific *performance targets been set* for your unit?

NO TARGETS WERE SET	TARGETS ARE VERY UNCLEAR	TARGETS ARE SOMEWHAT CLEAR	TARGETS ARE QUITE CLEAR	TARGETS ARE VERY CLEAR
1	2	3	4	5

2. *How specific or general* are the *unit operating rules, policies, and procedures* for coordinating and controlling the work activities of all unit members?

THERE ARE NO SET RULES, POLICIES, OR PROCEDURES	VERY GENERAL	SOMEWHAT SPECIFIC	QUITE SPECIFIC	VERY SPECIFIC
1	2	3	4	5

3. *How often* did unit members *violate or ignore* these unit operating rules, policies, or procedures during the past three months?

NOT ONCE	VERY SELDOM	ABOUT HALF THE TIME	QUITE OFTEN	ALL THE TIME
1	2	3	4	5

Table VII Unit Standardization Questions for Unit Member (Continues)

4. *How strictly* are these unit operating rules, policies, or procedures *enforced*?

NOT AT ALL ENFORCED	VERY LOOSELY ENFORCED	SOMEWHAT STRICTLY ENFORCED	QUITE STRICTLY ENFORCED	VERY STRICTLY ENFORCED
1	2	3	4	5

The index of unit standardization for the unit supervisor was based on the six questions which are stated in Table VIII.

Table VIII Unit Standardization Questions for Unit Supervisor

1. *How clearly* have specific *performance targets* been set for your unit?

NO TARGETS WERE SET	TARGETS ARE VERY UNCLEAR	TARGETS ARE SOMEWHAT CLEAR	TARGETS ARE QUITE CLEAR	TARGETS ARE VERY CLEAR
1	2	3	4	5

2. *How precisely* do *unit operating rules, policies, and procedures specify* how work activities are to be coordinated and controlled?

VERY GENERAL	MOSTLY GENERAL	SOMEWHAT SPECIFIC	QUITE SPECIFIC	VERY SPECIFIC
1	2	3	4	5

3. *How often* did unit members *violate or ignore* unit operating rules, policies, and procedures during the past three months?

NOT ONCE	VERY SELDOM	ABOUT HALF THE TIME	QUITE OFTEN	ALL THE TIME
1	2	3	4	5

Table VIII Unit Standardization Questions for Unit Supervisor (Continued)

4. *How strictly* are the unit operating rules, policies, and procedures *enforced*?

NOT AT ALL ENFORCED	VERY LOOSELY ENFORCED	SOMEWHAT STRICTLY ENFORCED	QUITE STRICTLY ENFORCED	VERY STRICTLY ENFORCED
1	2	3	4	5

5. *To what degree* are *numerical or quantified procedures used* to *measure* performance criteria of your unit?

NO MEASURE-MENT IS MADE	ONLY SUBJECTIVE NONQUANTIFIED IMPRESSIONS ARE RECORDED	LOOSE BUT QUANTIFIED MEASURES ARE RECORDED	QUITE SPECIFIC QUANTIFIED MEASURES ARE RECORDED	VERY SPECIFIC AND PRECISE QUANTIFIED MEASURES AND PROCEDURES ARE RECORDED
1	2	3	4	5

6. What *percent* of unit operating rules, policies, and procedures as a whole *are written out* in memos, reports, or a procedures manual?

0-20%	21-40%	41-60%	61-80%	81-100%
1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

JOB CODIFICATION (JOBCODIF) - Job codification is a measure of the extent to which rules define what the occupants of positions are to do, the degree to which job descriptions are specified, and the degree to which work is standardized (Hage and Aiken 1967, p. 79).

The following operational definition of Job Codification was obtained from Jerald Hage and Michael Aiken's 1967 study titled, "Relationship of Centralization to Other Structural Properties".

The index of job codification for the unit supervisor and unit member was computed by averaging the responses to the five questions which are stated in Table IX.

Table IX Job Codification Questions for Unit Supervisor and Unit Member

1. I feel that I am my own boss in most matters.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

2. Unit members can make their own decisions without checking with anybody else.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

3. How things are done in this unit is left up to the unit member who is doing the work.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

4. Unit members are allowed to do almost as they please.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

5. Most unit members make their own rules on the job.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

RULE OBSERVATION (RULEOBSR) - Rule observation is (1) a measure of whether or not rules are employed that define what the occupants of positions are to do (2) the degree to which job occupants are supervised in conforming to the standards established by job codification and (3) a measure of the latitude of behavior that is tolerated from standards (Hage and Aiken 1967, p. 79).

The following operational definition rule observation was obtained from Jerald Hage and Michael Aiken's 1967 study titled, "Relationship of Centralization to Other Structural Properties".

The index of rule observation for the unit supervisor and unit member was based on the two statements in Table X.

Table X Rule Observation Questions for Unit Supervisor and Unit Member

1. Unit members are constantly being checked on for rule violations.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

2. Unit members feel as though they are constantly being watched to see that they obey all the rules.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

DEGREE OF CENTRALIZATION (DEGRCENT) - The concept of centralization refers to delegation of authority among jobs in an organization or the location of decision making authority in an organization. It is measured in four ways: PARTICIPATION IN DECISION MAKING, HIERARCHY OF AUTHORITY, EMPLOYEE DISCRETION, AND SUPERVISORY DISCRETION.

PARTICIPATION IN DECISION MAKING (DECMAKE) - Participation in decision making represents how much the occupants of various positions participate in decisions about the allocation of resources and the determination of organization policies (Hage and Aiken 1967, p. 77). These decisions, such as hiring and promotion of personnel, the adoption of new policies, and the institution of new services, affect the organization as a whole.

The following operational definition of Participation in Decision Making was obtained from Jerald Hage and Michael Aiken's 1967 study titled, "Relationship of Centralization to Other Structural Properties".

The index of Participation in Decision Making for the unit supervisor and unit member was based on the four questions which are stated in Table XI.

Table XI Participation in Decision Making Questions for Unit Supervisor and Unit Member

1. How frequently do you usually participate in the decision to hire new staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

2. How frequently do you usually participate in decisions on the promotion of any of the staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

3. How frequently do you participate in decisions on the adoption of new policies?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

4. How frequently do you participate in the decisions on the adoption of new programs?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

HIERARCHY OF AUTHORITY: SUPERVISORY (AUTHORSU), UNIT EMPLOYEE (AUTHOREM), UNIT COLLEGIAL (AUTHORCO), AND EXTERNAL (AUTHOREX) - Hierarchy of authority is a measure of how power, in the form of making work-related decisions, is distributed among social positions (Hage and Aiken 1967, p. 78). If subordinates are allowed to make their own work-related decisions, then there is little reliance on hierarchy of authority. If subordinates must refer work-related decisions up the chain of command, then there is a high reliance on hierarchy of authority. Supervisory, unit employee, unit collegial, and external hierarchy of authority recognizes alternate sources of work-related decision making authority.

The following operational definitions of supervisory, unit employee, unit collegial, and external hierarchy of authority were obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of supervisory (1.b., 2.b., and 3.b.), unit employee (1.c., 2.c., and 3.c.), unit collegial (1.d., 2.d., and 3.d.), and external (1.a., 2.a., and 3.a.) hierarchy of authority for the unit member was based on the three questions which are stated in Table XII.

Table XII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Member

1. *How much say or influence* do *each* of the following have in *deciding what kinds of work or tasks* are to be performed in your unit:	AMOUNT OF SAY IN DECIDING UNIT'S WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5

Table XII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Member (Continued)

1. *How much say or influence* do *each* of the following have in *deciding what kinds of work or tasks* are to be performed in your unit:	AMOUNT OF SAY IN DECIDING UNIT'S WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
c. Unit members *individually*?	1	2	3	4	5
d. The unit supervisor and members *as a group* in unit meetings?	1	2	3	4	5

2. *How much influence* or say did *each* of the following have in *deciding performance criteria* for your unit:	AMOUNT OF SAY IN DECIDING CRITERIA				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5
c. Unit members *individually*?	1	2	3	4	5
d. Your supervisor and unit members *as a group* in unit meetings?	1	2	3	4	5

Table XII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Member (Continued)

3. *How much influence or say* did each of the following have in *deciding* upon the rules, policies, and procedures for your unit:	AMOUNT OF INFLUENCE IN DECIDING UNIT PROCEDURE				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5
c. Unit members *individually*?	1	2	3	4	5
d. Your supervisor and unit members *as a group* in unit meetings?	1	2	3	4	5

The index of supervisory (1.b., 2.b., 3.b., and 4.b.), unit employee (1.c., 2.c., 3.c., and 4.c.), unit collegial (1.d., 2.d., 3.d., and 4.d), and external (1.a., 2.a., 3.a., and 4.d.) hierarchy of authority for the unit supervisor was based on the four questions which are stated in Table XIII.

Table XIII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Supervisor

1. *How much say or influence* do each of the following have in *deciding what kinds of work or tasks* are to be performed in your unit:	AMOUNT OF SAY IN DECIDING UNIT'S WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You, as the *unit supervisor*?	1	2	3	4	5
c. Your immediate subordinates, *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

2. *How much influence* or say did *each* of the following have in *deciding performance criteria* for your unit:	AMOUNT OF SAY IN DECIDING CRITERIA				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You, as the unit supervisor?	1	2	3	4	5
c. Your immediate subordinates, *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

Table XIII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Supervisor (Continued)

3. *To what degree* are *each* of the following methods of appraisal *relied upon* to evaluate how well your unit performs its work:	DEGREE RELIED ON FOR EVALUATING WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Appraisals made by line managers or staff specialists *outside* of your immediate work unit?	1	2	3	4	5
b. Appraisals made by *you individually*, as the unit supervisor?	1	2	3	4	5
c. Appraisals made by your *immediate subordinates* who *individually* review and evaluate their own performance?	1	2	3	4	5
d. Appraisals made by you and your immediate subordinates *as a group*, who meet to review and evaluate the work of one or more unit members?	1	2	3	4	5

4. *How much influence* or say did *each of* the following have in *deciding* upon unit operating rules, policies, and procedures:	AMOUNT OF SAY IN DECIDING UNIT OPERATING RULES, POLICIES, AND PROCEDURES				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You *as the unit supervisor*?	1	2	3	4	5

Table XIII Supervisory, Unit Employee, Unit Collegial, and External Hierarchy of Authority Questions for Unit Supervisor (Continued)

4. *How much influence* or say did *each of* the following have in *deciding* upon unit operating rules, policies, and procedures:	AMOUNT OF SAY IN DECIDING UNIT OPERATING RULES, POLICIES, AND PROCEDURES				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
c. Your immediate subordinates *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

EMPLOYEE DISCRETION (EMPDIS) - Employee discretion is the amount of latitude unit members have in making work-related decisions (Van de Ven and Ferry 1980, p. 165).

The following operational definition of employee discretion was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of employee discretion for the unit member was based on the four questions which are stated in Table XIV.

Table XIV Employee Discretion Questions for Unit Member

How much say or influence do you have in making *each* of the following decisions about your work?	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining *what* tasks I will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work I have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* my work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

The index of employee discretion for the unit supervisor was based on the four questions which are stated in Table XV.

Table XV Employee Discretion Questions for Unit Supervisor

How much say or influence do your subordinates have in making *each* of the following decisions about their work?	AMOUNT OF INFLUENCE YOUR SUBORDINATES HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining *what* tasks they will perform from day to day?	1	2	3	4	5

Table XV Employee Discretion Questions for Unit Supervisor (Continued)

How much say or influence do your subordinates have in making *each* of the following decisions about their work?	AMOUNT OF INFLUENCE YOUR SUBORDINATES HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
b. *Setting quotas* on how much work they have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* their work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

SUPERVISORY DISCRETION (SUPDIS) - Supervisory discretion is the amount of latitude the unit supervisor exercises in making work-related decisions (Van de Van and Ferry 1980, p. 165).

The following operational definition of supervisory discretion was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations.*

The index of supervisory discretion for the unit member was based on the four questions which are stated in Table XVI.

Table XVI Employee Discretion Questions for Unit Member

Listed below are the same work decisions. This time indicate how *much influence* your immediate supervisor has in making each decision about your work.	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining what tasks I will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work I have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* my work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

The index of supervisory discretion for the unit supervisor was based on the four questions which are stated in Table XVII.

Table XVII Supervisory Discretion Questions for Unit Supervisor

Listed below are the same work decisions. This time indicate how *much influence* you as the unit supervisor have in making each decision about your subordinates' work.	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining what tasks your subordinates will perform from day to day?	1	2	3	4	5

Table XVII Supervisory Discretion Questions for Unit Supervisor (Continued)

Listed below are the same work decisions. This time indicate how *much influence* you as the unit supervisor have in making each decision about your subordinates' work.	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
b. *Setting quotas* on how much work your subordinates will have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* your subordinates work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

<u>DEGREE OF COMPLEXITY</u> - The concept of complexity refers to the number of different jobs and the number of different units in an organization. Since this study is at the organizational sub-unit level of analysis, the number of different jobs in a unit and not the number of different units in an organization is of interest. It is measured in three ways: NUMBER OF JOB TITLES IN A UNIT, ROLE INTERCHANGEABILITY IN A UNIT, and UNIT SKILL HETEROGENEITY.

NUMBER OF JOB TITLES IN UNIT (UNIT SPECIALIZATION) - The "number of job titles in unit" or unit specialization is a measure of the horizontal division of labor within a unit (Van de Ven and Ferry 1980, p. 396).

The number of job titles in a unit is computed by counting the number of job titles that appear in the organizational chart. Since this measure is an objective measure and the other measures are subjective measures, it was not calculated and analyzed.

ROLE INTERCHANGEABILITY IN THE UNIT (ROLEINT) - Role interchangeability in the unit is defined as "...the degree to which A can perform B's job at short notice and B can perform A's job, even when A and B have different job titles or different functional assignments" (Van de Ven and Ferry 1980, p. 396). Role interchangeability is the converse of personnel specialization.

The following operational definition of role interchangeability in the unit was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of role interchangeability in the unit for the unit member was based on the three questions which are stated in Table XVIII.

Table XVIII Role Interchangeability in the Unit Questions for Unit Member

1. During the past 3 months, *how many other unit members performed the same basic tasks* as you did?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

2. *How many other unit members are qualified* to do your tasks?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

3. *How easy* would it be to *rotate* the jobs *between unit members*, so that each could do a good job performing someone else's tasks?

VERY DIFFICULT, MOST MEMBERS WOULD NEED EXTENSIVE RETRAINING	QUITE DIFFICULT, SOME MEMBERS WOULD NEED EXTENSIVE RETRAINING	SOMEWHAT DIFFICULT, A FEW MEMBERS WOULD NEED RETRAINING	QUITE EASY, SOME MEMBERS WOULD NEED MINOR RETRAINING	VERY EASY, NO MEMBERS WOULD NEED RETRAINING
1	2	3	4	5

The index of role interchangeability in the unit for the unit supervisor was based on the three questions which are stated in Table XIX.

Table XIX Role Interchangeability in the Unit Questions for Unit Supervisor

1. During the past 3 months, *how many* of your immediate unit *subordinates performed the same basic tasks*, or did each perform a different task?

NO ONE PERFORMED SAME TASKS	ONLY A FEW PERFORMED SAME TASKS	ABOUT HALF PERFORMED SAME TASKS	MANY PERFORMED SAME TASKS	ALL PERFORMED THE SAME BASIC TASKS
1	2	3	4	5

Table XIX Role Interchangeability in the Unit Questions for Unit Supervisor (Continued)

2. *How many of your immediate subordinates are qualified* to do one another's jobs?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

3. *How easy* would it be to rotate the jobs of your *immediate subordinates*, so that each could do a good job performing the other's tasks?

VERY DIFFICULT, MOST MEMBERS WOULD NEED EXTENSIVE RETRAINING	QUITE DIFFICULT, SOME MEMBERS WOULD NEED EXTENSIVE RETRAINING	SOMEWHAT DIFFICULT, A FEW MEMBERS WOULD NEED RETRAINING	QUITE EASY, SOME MEMBERS WOULD NEED MINOR RETRAINING	VERY EASY, NO MEMBERS WOULD NEED RETRAINING
1	2	3	4	5

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

UNIT SKILL HETEROGENEITY (UNTHET_S & UNTHET_M) - "Skill heterogeneity is defined as the range of different skills and competencies possessed by people in an organizational unit as a group." "The construct is a unit-level counterpart to the degrees of expertise or professionalism of individual members of a work unit" (Van de Ven and Ferry 1980, p. 397).

The following operational definition of unit skill heterogeneity was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations.*

The index of unit skill heterogeneity for the unit supervisor and unit member was based on the three questions which are stated in Table XX.

Table XX Unit Skill Heterogeneity Questions for Unit Supervisor and Unit Member

1. *How many hours per week on or off the job* do you spend in some kind of *reading or training* to keep current in the skills needed to do your job (**not including formal training e.g. OPM courses**)?

LESS THAN 1 HR/WK	ABOUT 1-3 HR/WK	ABOUT 4-6 HR/WK	ABOUT 7-9 HR/WK	ABOUT 10 HR/WK OR MORE
1	2	3	4	5

2. When you *began* this job, *how long a period of orientation and training* did you receive that was *directly related to your job*?

A FEW HOURS OR LESS	ABOUT A DAY	ABOUT A WEEK	ABOUT A MONTH	MORE THAN A MONTH
1	2	3	4	5

3. How many *years* of academic, vocational, or professional *education* have you obtained *beyond high school*?

YEARS AFTER HIGH SCHOOL									
0	1	2	3	4	5	6	7	8	9

Unit skill heterogeneity is computed as the standard deviations of the responses for all personnel within the organizational unit (UNTHET_S). In addition, an average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2) (UNTHET_M).

PROCESS VARIABLES

WORK FLOW INTERDEPENDENCE WITHIN UNIT (WKFLOW) - "Work flows are the materials, objects, or clients that are sent or transported between people and/or machines within organizational units" (Van de Ven and Ferry 1980, p. 402).

The following operational definition of work flow interdependence within unit was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

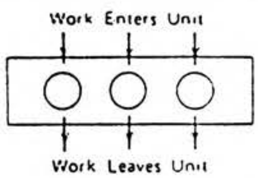
The index of work flow interdependence within unit was based on the four questions which are stated in Table XXI. These questions are in the unit supervisor questionnaire only.

Table XXI Work Flow Interdependence Within Unit Questions for Unit Supervisor

The next four questions are about the internal flow of work between your immediate subordinates. Listed and diagrammed below are four common ways that the work performed in your unit can flow between your immediate subordinates. (You, as the unit supervisor, should consider yourself outside the boxes below.)

Table XXI Work Flow Interdependence Within Unit Questions for Unit Supervisor (Continued)

Please indicate, *how much* of the *normal work* in your unit *flows between your immediate subordinates* in a manner as described by *each* of the following cases:	HOW MUCH WORK NORMALLY FLOWS BETWEEN MY IMMEDIATE SUBORDINATES IN THE MANNER INDICATED				
	ALMOST NONE OF THE WORK	LITTLE	ABOUT 50% OF ALL THE WORK	A LOT	ALMOST ALL OF THE WORK
a. *Independent Work Flow Case*, where work and activities are performed by your immediate subordinates separately and do not flow between them?	1	2	3	4	5
b. *Sequential Work Flow Case*, where work and activities flow between your immediate subordinates, but mostly in only one direction?	1	2	3	4	5



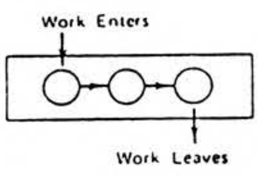
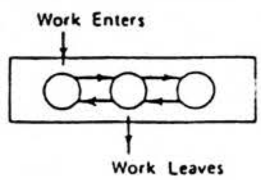
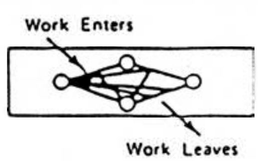


Table XXI Work Flow Interdependence Within Unit Questions for Unit Supervisor (Continued)

40. Please indicate, *how much* of the *normal work* in your unit *flows between your immediate subordinates* in a manner as described by *each* of the following cases:	HOW MUCH WORK NORMALLY FLOWS BETWEEN MY IMMEDIATE SUBORDINATES IN THE MANNER INDICATED				
	ALMOST NONE OF THE WORK	LITTLE	ABOUT 50% OF ALL THE WORK	A LOT	ALMOST ALL OF THE WORK
c. *Reciprocal Work Flow Case*, where work and activities flow between your immediate subordinates in a back-and-forth manner *over a period of time*? 	1	2	3	4	5
d. *Team Work Flow Case*, where work and activities come into your unit and your immediate subordinates diagnose, problem solve, and collaborate as a group *at the same time* in meetings to deal with the work? 	1	2	3	4	5

Answers to the four questions were weighted by multiplying the supervisor's response to independent flow by zero, sequential flow by .33, reciprocal flow by .66, and team flow by one, and then adding the products to obtain the overall work flow interdependence score. A non-weighted work flow interdependence score was also calculated and analyzed (NWWKFL).

UNIT COMMUNICATIONS OR INFORMATION FLOWS (INFLOW) - "Information flows are work-related messages sent among unit personnel through three different modes of communication: *written* memos, reports, and letters; *personal* one-to-one discussions; and *group* or staff meetings among three or more unit personnel" (Van de Ven and Ferry 1980, p. 403).

The following operational definition of unit communications (information flows) was obtained from Van de Ven and Ferry's 1980 book titled *Measuring and Assessing Organizations*.

The index of written (1.a., 1.b., and 1.c.), personal (2.a., 2.b., and 2.c.), and group (3.a., 3.b., and 4) unit communications (information flows) for the unit member was based on the four questions which are stated in Table XXII.

Table XXII Unit Communications (Information Flows) Questions for Unit Member

1. During the past 3 months, *how often* did you receive or send *written reports or memos* related to your work from or to each of the following people:	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS OR MEMOS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Your unit supervisor?	1	2	3	4	5

Table XXII Unit Communications (Information Flows) Questions for Unit Member (Continued)

1. During the past 3 months, *how often* did you receive or send *written reports or memos* related to your work from or to each of the following people:	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS OR MEMOS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
b. Other unit members or co-workers?	1	2	3	4	5
c. People outside of your unit?	1	2	3	4	5

2. During the past 3 months, *how often* did you have work-related *discussions (face-to-face or by telephone)* with each of the following people:	HOW OFTEN HAD WORK-RELATED DISCUSSIONS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Your unit supervisor?	1	2	3	4	5
b. Other unit members or co-workers?	1	2	3	4	5
c. People outside of your unit?	1	2	3	4	5

3. During the past 3 months, *how often* were you involved in *special group problem-solving meetings* with:	HOW OFTEN WERE MEETINGS HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
a. Two or more people from your unit?	1	2	3	4	5	6

Table XXII Unit Communications (Information Flows) Questions for Unit Member (Continued)

3. During the past 3 months, *how often* were you involved in *special group problem-solving meetings* with:	HOW OFTEN WERE MEETINGS HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
b. Two or more people from outside of your unit?	1	2	3	4	5	6
4. *How often* were regularly scheduled staff meetings held among people in your unit.	1	2	3	4	5	6

The index of unit communications (information flows) for the unit supervisor was based on the four questions which are stated in Table XXIII.

Table XXIII Unit Communications (Information Flows) Questions for Unit Supervisor

1. To coordinate the work of your unit during the past 3 months, *how often* were *written reports or memos* sent or received:	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS OR MEMOS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Between you and unit members?	1	2	3	4	5

Table XXIII Unit Communications (Information Flows) Questions for Unit Supervisor (Continued)

1. To coordinate the work of your unit during the past 3 months, *how often* were *written reports or memos* sent or received:	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS OR MEMOS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
b. Among unit members?	1	2	3	4	5
c. Between you and people outside of your unit?	1	2	3	4	5

2. During the past 3 months, *how often did work-related discussions (face-to-face or by telephone)* occur on a one-to-one basis:	HOW OFTEN HAD WORK-RELATED DISCUSSIONS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Between you and unit members?	1	2	3	4	5
b. Among unit members?	1	2	3	4	5
c. Between you and people outside your unit?	1	2	3	4	5

3. *How frequently* did you conduct *regularly scheduled staff or unit meetings* with your immediate subordinates during the past 3 months?	HOW OFTEN MEETINGS WERE HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
	1	2	3	4	5	6

Table XXIII Unit Communications (Information Flows) Questions for Unit Supervisor (Continued)

	HOW OFTEN MEETINGS WERE HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
4. During the past three months, *how frequently* were you involved in *impromptu, unscheduled meetings to solve specific work problems*:						
a. With two or more of your subordinates?	1	2	3	4	5	6
b. With two or more people from outside of your unit?	1	2	3	4	5	6

An average score on these questions was computed for each respondent; then the data were aggregated into unit scores by assigning equal weights to responses from the unit supervisor (1/2) and unit members (1/2).

MECHANISTIC-ORGANIC VARIABLE (HIG_LOW2)

The above structure and process variables were collapsed into one mechanistic-organic, variable (HIG_LOW2). In order to do this, the scores of the unit standardization, job codification, and external hierarchy of authority variable questions were reverse ordered so that the larger the value, the more organic structure. Unit scores for each structure and process dimension were recalculated using the reversed ordered values and the procedures described in this section. Once the structural and process dimensions had been recalculated for each unit, their scores were added to give an overall mechanistic-organic value for each unit.

SERVICE QUALITY VARIABLES (CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ)

SERVICE QUALITY (CSSERVQ & CSSERVWT) - Service Quality is defined as the discrepancy between customers' expectations and perceptions (Zeithaml, Parasuraman, and Berry 1990, p. 20). Parasuraman, Zeithaml, and Berry (1988) used factor analysis to suggest that the domain of service quality can be conceptualized as comprised of five, first-order dimensions: TANGIBLES, RELIABILITY, RESPONSIVENESS, ASSURANCE, and EMPATHY.

The following conceptual definitions of the five service quality dimensions were obtained from Zeithaml, Parasuraman and Berry's 1990 book titled, *Delivering Quality Service: Balancing Customer Perceptions and Expectations* and their 1991 paper titled, "Refinement and Reassessment of the SERVQUAL Scale". The actual operational definitions were obtained from Parasuraman, Zeithaml, and Berry's 1994 article titled, "Alternative Scales for Measuring Service Quality: A Comparative Assessment Based on Psychometric and Diagnostic

Criteria". They measure deviations from normative standards or deviations from what customers believe a service provider *should* offer. Service quality researchers have generally viewed expectations as normative standards verses predictive standards or what customers feel a service provider *will* offer. Customer satisfaction/dissatisfaction researchers have generally viewed expectations as predictive standards.

RELIABILITY (RELBTY) - "Ability to perform the promised service dependably and accurately" (Zeithaml, Parasuraman, and Berry 1990, p. 26).

The index of the reliability dimension was based on the five questions which are stated in Table XXIV.

Table XXIV Reliability Questions

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
1. providing services as promised	1	2	3	4	5	6	7	8	9	N
2. dependability in handling customers' service problems	1	2	3	4	5	6	7	8	9	N
3. performing services right the first time	1	2	3	4	5	6	7	8	9	N
4. providing services at the promised time	1	2	3	4	5	6	7	8	9	N

Table XXIV Reliability Questions (Continued)

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
5. maintaining error-free records	1	2	3	4	5	6	7	8	9	N

RESPONSIVENESS (RESP) - "Willingness to help customers and provide prompt service" (Zeithaml, Parasuraman, and Berry 1990, p. 26).

The index of the responsiveness dimension was based on the four questions which are stated in Table XXV.

Table XXV Responsiveness Questions

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
6. keeping customers informed about when services will be performed	1	2	3	4	5	6	7	8	9	N
7. prompt service to customers	1	2	3	4	5	6	7	8	9	N
8. willingness to help customers	1	2	3	4	5	6	7	8	9	N

Table XXV Responsiveness Questions (Continued)

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
9. readiness to respond to customer's requests	1	2	3	4	5	6	7	8	9	N

ASSURANCE (ASSUR) - "Knowledge and courtesy of employees and their ability to convey trust and confidence" (Zeithaml, Parasuraman, and Berry 1990, p. 26).

The index of the assurance dimension was based on the four questions which are stated in Table XXVI.

Table XXVI Assurance Questions

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin- ion**
10. employees who instill confidence in customers	1	2	3	4	5	6	7	8	9	N
11. making customers feel safe in their transactions	1	2	3	4	5	6	7	8	9	N
12. employees who are consistently courteous	1	2	3	4	5	6	7	8	9	N

Table XXVI Assurance Questions (Continued)

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	*Lower* **Than My Desired Service Level**			*The Same As* **My Desired Service Level**			*Higher* **Than My Desired Service Level**			**No Opin-ion**
13. employees who have the knowledge to answer customer questions	1	2	3	4	5	6	7	8	9	N

EMPATHY (EMPTHY) - "Caring, individualized attention the firm provides its customers" (Zeithaml, Parasuraman, and Berry 1990, p. 26).

The index of the empathy dimension was based on the five questions which are stated in Table XXVII.

Table XXVII Empathy Questions

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	*Lower* **Than My Desired Service Level**			*The Same As* **My Desired Service Level**			*Higher* **Than My Desired Service Level**			**No Opin-ion**
14. giving customers individual attention	1	2	3	4	5	6	7	8	9	N
15. employees who deal with customers in a caring fashion	1	2	3	4	5	6	7	8	9	N
16. having the customer's best interest at heart	1	2	3	4	5	6	7	8	9	N

Table XXVII Empathy Questions (Continued)

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower*** **Than My Desired Service Level**			***The Same As*** **My Desired Service Level**			***Higher*** **Than My Desired Service Level**			**No Opin-ion**
17. employees who understand the needs of their customers	1	2	3	4	5	6	7	8	9	N
18. convenient business hours	1	2	3	4	5	6	7	8	9	N

TANGIBLES (TANG) - "Appearance of physical facilities, equipment, personnel, and communication materials" (Zeithaml, Parasuraman, and Berry 1990, p. 26).

The index of the tangibles dimension was based on the four questions which are stated in Table XXVIII.

Table XXVIII Tangibles Questions

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower*** **Than My Desired Service Level**			***The Same As*** **My Desired Service Level**			***Higher*** **Than My Desired Service Level**			**No Opin-ion**
19. modern equipment	1	2	3	4	5	6	7	8	9	N
20. visually appealing facilities	1	2	3	4	5	6	7	8	9	N

Table XXVIII Tangibles Questions (Continued)

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	*Lower* Than My Desired Service Level			*The Same As* My Desired Service Level			*Higher* Than My Desired Service Level			No Opin-ion
21. employees who have a neat, professional appearance	1	2	3	4	5	6	7	8	9	N
22. visually appealing materials associated with the service	1	2	3	4	5	6	7	8	9	N

A unit's quality of service along each of the five dimensions were assessed across all customers by averaging their scores on statements making up the dimension. For each customer, the scores on the statements pertaining to the dimension were added and then divided by the number of statements making up the dimension. This number was then multiplied by the importance weight that was assigned by the customer to that dimension. The importance weight is the points that the customer allocated to the dimension divided by 100. For each customer, the weighted service quality scores were added across all five dimensions to obtain a combined weighted service quality score. The combined service quality scores of each of the customers were then added and divided by the number of customers to give weighted, unit service quality score (CSSERVWT). An unweighted, unit service quality score was also calculated (CSSERVQ).

SERVICE QUALITY (SERVQUAL & OVERALSQ) - In addition to measuring unit service quality by the method just described, one may measure unit service quality via one question. This "overall service quality question" is intended to measure unit service quality and be equivalent to the weighted, unit service quality score (CSSERVWT). The "overall service quality question" was administered to the employees and supervisors (SERVQUAL) and internal customers (OVERALSQ).

The index of overall service quality for the unit employee and unit supervisor (SERVQUAL) was based on the question which is stated in Table XXIX.

Table XXIX Overall Service Quality Question for the Unit Employee and Unit Supervisor

How would the internal customer, that you identified in question number 1, answer the following statement? (Desired service level is defined as the level of performance your customer believes that a unit of your type *can* and *should deliver*. **"XYZ" in the following statement is your work unit.**)

	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin-ion**
When it comes to **overall service quality** XYZ's performance is:	1	2	3	4	5	6	7	8	9	N

The index of overall service quality for the customer (OVERALSQ) was based on the question which is stated in Table XXX.

Table XXX Overall Service Quality Question for the Customer

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin-ion**
23. overall service quality	1	2	3	4	5	6	7	8	9	N

High service quality is defined as service quality that is perceived by the customer as being *the same as* their desired service level. *Low* service quality is defined as service quality that is perceived by the customer as being either *lower or higher* than their desired service level. Quantitative definitions of high and low service quality were developed as follows. The mean of the CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ unit means were calculated. The standard error of the means for the CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ were calculated. The standard error of the means was doubled and then subtracted and added to the mean to determine the range of values that indicate a service level that is the same as the customers desired service level. This range of values represents high service quality. Any value higher than two standard error of the means indicates that the service is higher than the customer's desired service level. Any value lower than two standard error of the means indicates that the service is lower than the customer's desired service level.

The probability is approximately 95 percent that the population ("true") mean lies within that range of values. That is, if only chance error is making the means fluctuate, then only approximately 5 percent of the time will the means of random samples of this size will lie outside this interval. The following are the mean, the standard error of the means, the mean plus two standard error of the mean, and the mean minus two standard error of the means for CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ.

Table XXXI Range of Service Quality Values that Represent High Service Quality

	Mean (M)	Standard Error of the Mean (STD ERR M)	Mean Plus 2 Times STD ERR M	Mean Minus 2 Times STD ERR M
CSSERVQ	6.1417	0.1212	6.3842	5.8992
CSSERVWT	6.1166	0.1298	6.3764	5.8569
SERVQUAL	6.4184	0.1555	6.7296	6.1074
OVERALSQ	6.1324	0.1413	6.4151	5.8497

This definition of service quality interprets service attributes as being *classical ideal point* attributes, where a customer's ideal level of service is a finite point. Any level of service up to that ideal level of service, will please the customer, and any level of service beyond that ideal level of service, will displease the customer (e.g. the friendliness of a waiter in a restaurant). This is in contrast to interpreting service attributes as being *vector* attributes, in which a customer's ideal level of service is at an infinite level. In this case, higher performance is *always* better (e.g. travel time to work) (Parasuraman, Zeithaml, and Berry 1994a).

With this definition of high service quality, the mean of the CSSERVQ, CSSERVWT, SERVQUAL & OVERALSQ means become the customer's ideal, or desired service level. Deviations from the ideal, or desired service level, in either direction, is perceived by the customer as being lower in service quality.

One might expect the ideal, or desired service level for the universe of occurrences to be in the middle of our measurement scale, or at a value of four and a half. Yet the values obtained are higher: CSSERVQ, 6.1417; CSSERVWT, 6.1166; SERVQUAL, 6.4184; OVERALSQ, 6.1324. This might indicate that the generalizability of the results of this study is limited.

III. RESULTS

A. ANALYSIS, STATISTICAL TESTS, AND ASSUMPTIONS

The main objective of this study was to test the deviation-score hypotheses. To accomplish this, the analysis used the deviation-score approach for examining the interaction forms-of-fit in contingency theory. The deviation-score approach uses ideal, linear context-structure relationships in calculating residuals. The ideal, linear context-structure relationships are predicted by the congruence hypotheses. Therefore, in the process of testing the deviation-score hypotheses, the congruence hypotheses were tested.

"Fit" using the deviation-score approach for examining the interaction forms-of-fit in contingency theory is defined as the adherence or conformance of an organization's structure to an ideal, linear relationship between dimensions of context and structure (Drazin and Van de Ven 1985). If an organization's structure conforms to the ideal, linear context-structure relationship then performance will be high. If an organization's structure deviates from the ideal, linear context-structure relationship, then performance will be low. This interpretation implies that there is a value of structure for each value of technology that will maximize effectiveness (Schoonhoven 1981).

The approach developed by Olson, Walker, and Ruekert (1995) for examining the interaction form of "fit" in contingency theory was used in this analysis and is described below.

Best-fitting least squares lines of each unit structure and process dimension on task difficulty and/or variability (task uncertainty) was calculated to establish the base-line context-structure relationship (regression line) from which residuals were calculated. The congruence hypotheses predict these relationships.

The congruence hypotheses were tested using simple regression to determine the relation between task difficulty and/or variability (task uncertainty), and each structure and process dimension. Coefficient of correlations (*r*) were calculated as a measure of the direction and degree, strength, or magnitude of the relation between the task difficulty and/or variability (task uncertainty), and each structure and process dimension. Congruence or "fit" was confirmed if the coefficient of correlation (*r*) of task difficulty and/or variability (task uncertainty), on each structure and process dimension was in the predicted direction and significant. The statistical significance of the regressions was tested by calculating the p value of the correlation coefficients.

The deviation-score hypotheses were tested using one-way analysis of variance. For each unit, a residual was calculated for each structure and process dimension. The residuals, for each structure and process dimension, were divided into three equal groups: units whose observations laid farthest above the regression line (too organic or too mechanistic), units whose observations laid closest to the regression line (fit), and units whose observations laid farthest below the regression line (too mechanistic or too organic). These residuals and their groupings may be found in Appendix B, CALCULATED VARIABLES.

A one-way analysis of variance was performed to identify whether the groups varied significantly on performance (service quality) in the predicted direction.

This methodology takes advantage of the direction of the residuals (too mechanistic or too organic) and alleviates the potential of multicolinearity of the context-structure residuals with their components.

The deviation-score approach assumes that the base-line context-structure relationship (regression line) from which residuals are calculated represents high performing units (units that produce high service quality). If this regression line does not represent high performing units then deviations from that line will not be meaningful. In defense of this assumption, the natural selection argument that an evolutionary process ensures that only the best performing units survive may and has been used. Also in support of this assumption, Drazin and Van de Ven (1985) found that using a group of high-performance units did not improve the results.

In addition to testing the congruence and deviation score hypotheses, an interaction hypothesis was postulated and tested using an overall mechanistic-organic dimension.

The interaction hypothesis was tested using the means. The maximum possible value, smallest possible value, and median values of the mechanistic-organic (HIG_LOW2) and task uncertainty (TASKUNCR) scales were determined in order to categorize the units into four groups based on the mechanistic-organic and task uncertainty dimensions. The four categories are mechanistic-low uncertainty, mechanistic-high uncertainty, organic-low uncertainty, and organic-high

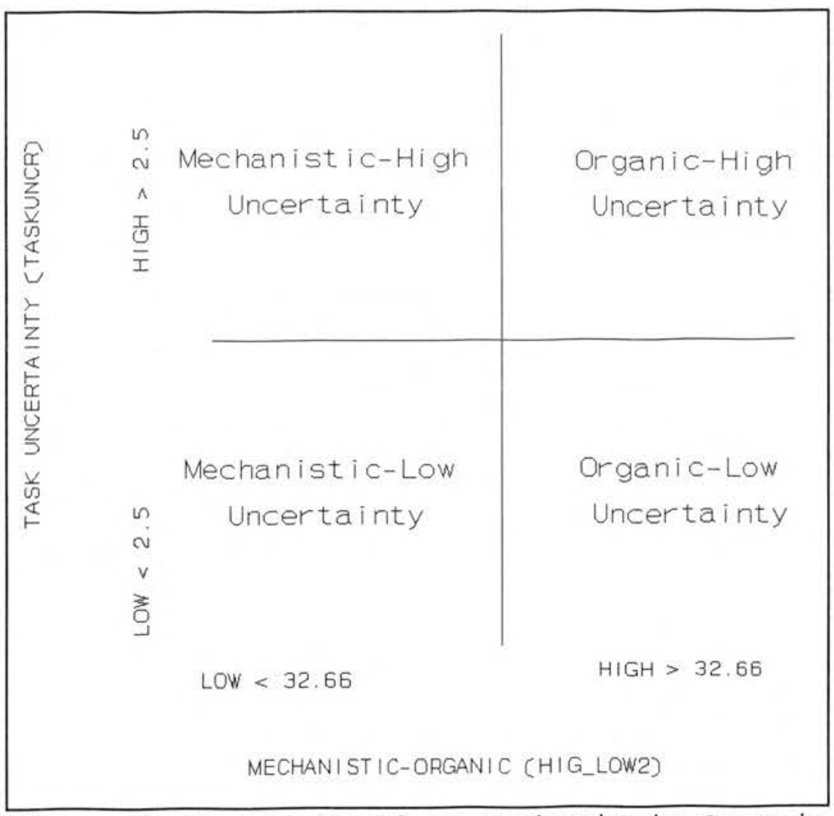


Figure 4 Groups Based on Mechanistic-Organic and Task Uncertainty Scales

uncertainty and shown in Figure 4. The means of the service quality variables of these groups were compared to a range of values for those service quality variables that represent high service quality.

B. PRESENTATION OF DATA

1. Calculated Variables. The values of the calculated variables may be found in Appendix B, CALCULATED VARIABLES.

2. Other Manipulations of Data. Correlations between the structure and process variables and their underlying questions were checked. It was found that all of the structure and process variables were highly correlated with their underlying questions except unit standardization and the third question used to measure it. The third question was excluded from the scoring of the unit standardization variable.

3. Summary of Results.

a. Congruence Hypothesis 1. Congruence hypothesis 1 states that, if the work of an organizational unit increases in variability (U), then there is a decrease unit standardization (S) (more organic). See Table XXXII for the results.

b. Deviation-Score Hypothesis 1. Deviation-score hypothesis 1 states that, given a value of variability of a unit's work, there is a matching value for unit standardization that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. See Table XXXIII for the results.

Table XXXII Results of Congruence Hypothesis 1

Congruence Hypothesis: H_1: $-1 < r_{US} < 0$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Unit Standardization (UNTSTD) and:	
Task Difficulty	r=-.2408, p=.096, n=49
Task Variability	r=**-.3601***, p=**.011**, n=49
Task Uncertainty	r=**-.3532***, p=**.013**, n=49

Note: Marked correlations are significant at p < .05

Table XXXIII Results of Deviation-Score Hypothesis 1

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Unit Standardization (UNTSTD)	M=6.2137 (n=14)	M=6.1180 (n=20)	M=6.1232 (n=14)
	F=0.08, p=0.923		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

c. <u>Congruence Hypothesis 2</u>. Congruence hypothesis 2 states that, if the work of an organizational unit increases in variability (U), then there is a decrease job codification (S) (more organic). See Table XXXIV for the results.

Table XXXIV Results of Congruence Hypothesis 2

Congruence Hypothesis: H_1: $-1 < r_{US} < 0$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Job Codification (JOBCODIF) and:	
Task Difficulty	r=-.2684, p=.062, n=49
Task Variability	r=**-.4046***, p=**.004**, n=49
Task Uncertainty	r=**-.3990***, p=**.005**, n=49

Note: Marked correlations are significant at p < .05

d. <u>Deviation-Score Hypothesis 2</u>. Deviation-score hypothesis 2 states that, given a value of variability of a unit's work, there is a matching value for job codification that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. See Table XXXV for the results.

Table XXXV Results of Deviation-Score Hypothesis 2

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Job Codification (JOBCODIF)	M=5.7862 (n=16)	M=6.3347 (n=18)	M=6.2478 (n=16)
	F=1.7896, p=0.9102		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

e. Congruence Hypothesis 3. Congruence hypothesis 3 states that, if the work of an organizational unit increases in variability (*U*), then there is a decrease rule observation (*S*) (more organic). See Table XXXVI for the results.

Table XXXVI Results of Congruence Hypothesis 3

Congruence Hypothesis: H_1: $-1 < r_{US} < 0$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Rule Observation (RULEOBSR) and:	
Task Difficulty	r=-.1089, p=.456, n=49
Task Variability	r=**-.3748***, p=**.008**, n=49
Task Uncertainty	r=**-.2883***, p=**.045**, n=49

Note: Marked correlations are significant at p < .05

f. <u>Deviation-Score Hypothesis 3</u>. Deviation-score hypothesis 3 states that, given a value of variability of a unit's work, there is a matching value for rule observation that will produce service levels the same as the customer's desired service level. Deviations above this relation (too mechanistic) will produce service levels lower than the customer's desired service level. Deviations below this relation (too organic) will produce service levels higher than the customer's desired service level. See Table XXXVII for the results.

Table XXXVII Results of Deviation-Score Hypothesis 3

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Rule Observation (RULEOBSR)	M=6.4132 (n=9)	M=5.8822 (n=14)	M=6.1488 (n=21)
	F=1.0700, p=0.3523		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

g. <u>Congruence Hypothesis 4</u>. Congruence hypothesis 4 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in participation in decision making (*S*) (more organic). See Table XXXVIII for the results.

Table XXXVIII Results of Congruence Hypothesis 4

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Participation in Decision Making (DECMAKE) and:	
Task Difficulty	r=+.2177, p=.133, n=49
Task Variability	r=+.1939, p=.182, n=49
Task Uncertainty	r=+.2371, p=.101, n=49

Note: Marked correlations are significant at $p < .05$

h. <u>Congruence Hypothesis 5</u>. Congruence hypothesis 5 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in supervisor, unit employee, and collegial hierarchy of authority (*S*) (more organic). See Table XXXIX for the results.

i. <u>Deviation-Score Hypothesis 5</u>. Deviation-score hypothesis 5 states that, given a value of difficulty of a unit's work, there is a matching value for supervisor, unit employee, and collegial hierarchy of authority that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table XL for the results.

Table XXXIX Results of Congruence Hypothesis 5

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Supervisor Hierarchy of Authority (AUTHORSU) and:	
Task Difficulty	r=-.1181, p=.419, n=49
Task Variability	r=+.0023, p=.987, n=49
Task Uncertainty	r=-.0674, p=.645, n=49
Unit Employee Hierarchy of Authority (AUTHOREM) and:	
Task Difficulty	r=+.0350, p=.811, n=49
Task Variability	r=**+.3139***, p=**.028**, n=49
Task Uncertainty	r=+.2054, p=.157, n=49
Collegial Hierarchy of Authority (AUTHORCO) and:	
Task Difficulty	r=-.2067, p=.154, n=49
Task Variability	r=+.0322, p=.826, n=49
Task Uncertainty	r=-.0986, p=.500, n=49

Note: Marked correlations are significant at p < .05

Table XL Results of Deviation-Score Hypothesis 5

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Unit Employee Hierarchy of Authority (AUTHOREM)	M=6.9256 (n=10)	M=6.1017 (n=21)	M=5.5232 (n=13)
	F=**10.9742***, p=**0.0001**		

Notes: Marked correlations are significant at p < .05
M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

j. Congruence Hypothesis 6. Congruence hypothesis 6 states that, if the work of an organizational unit increases in difficulty (U), then there is a decrease in external hierarchy of authority (S) (more organic). See Table XLI for the results.

Table XLI Results of Congruence Hypothesis 6

Congruence Hypothesis: H_1: $-1 < r_{US} < 0$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
External Hierarchy of Authority (AUTHOREX) and:	
Task Difficulty	r=+.0952, p=.515, n=49
Task Variability	r=+.0184, p=.900, n=49
Task Uncertainty	r=+.0637, p=.664, n=49

Note: Marked correlations are significant at p < .05

k. Congruence Hypothesis 7. Congruence hypothesis 7 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in employee and supervisory discretion (*S*) (more organic). See Table XLII for the results.

Table XLII Results of Congruence Hypothesis 7

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Employee Discretion (EMPDIS) and:	
Task Difficulty	r=+.0442, p=.763, n=49
Task Variability	r=**+.3155***, p=**.027**, n=49
Task Uncertainty	r=+.2115, p=.145, n=49
Supervisory Discretion (SUPDIS) and:	
Task Difficulty	r=-.0837, p=.568, n=49
Task Variability	r=**-.3273***, p=**.022**, n=49
Task Uncertainty	r=-.2447, p=.090, n=49

Note: Marked correlations are significant at $p < .05$

l. Deviation-Score Hypothesis 7. Deviation-score hypothesis 7 states that, given a value of difficulty of a unit's work, there is a matching value for employee and supervisory discretion that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table XLIII for the results.

Table XLIII Results of Deviation-Score Hypothesis 7

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Employee Discretion (EMPDIS)	M=6.2732 (n=14)	M=6.0911 (n=20)	M=5.9547 (n=10)
	F=0.4052, p=0.669		
Supervisory Discretion (SUPDIS)	M=6.3381 (n=9)	M=5.8255 (n=20)	M=6.3760 (n=15)
	F=2.2420, p=0.119		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

m. <u>Congruence Hypothesis 8</u>. Congruence Hypothesis 8 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in role interchangeability in the unit (*S*) (more organic). See Table XLIV for the results.

Table XLIV Results of Congruence Hypothesis 8

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Role Interchangeability in The Unit (ROLEINT) and:	
Task Difficulty	r=+.0750, p=.609, n=49
Task Variability	r=**-.2894***, p=**.044**, n=49
Task Uncertainty	r=-.1305, p=.371, n=49

Note: Marked correlations are significant at $p < .05$

n. Deviation-Score Hypothesis 8. Deviation-score hypothesis 8 states that, given a value of difficulty of a unit's work, there is a matching value for role interchangeability in the unit that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table XLV for the results.

o. Congruence Hypothesis 9. Congruence hypothesis 9 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in unit skill heterogeneity (*S*) (more organic). See Table XLVI for the results.

Table XLV Results of Deviation-Score Hypothesis 8

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Role Interchangeability in Unit (ROLEINT)	M=6.2057 (n=14)	M=6.4244 (n=13)	M=5.8115 (n=17)
	F=2.0690, p=0.1392		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

Table XLVI Results of Congruence Hypothesis 9

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Unit Skill Heterogeneity (UNTHET_M) and:	
Task Difficulty	r=+.0455, p=.756, n=49
Task Variability	r=**+.3933***, p=**.005**, n=49
Task Uncertainty	r=+.2574, p=.074, n=49

Note: Marked correlations are significant at p < .05

p. Deviation-Score Hypothesis 9. Deviation-score hypothesis 9 states that, given a value of difficulty of a unit's work, there is a matching value for unit skill heterogeneity that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table XLVII for the results.

Table XLVII Results of Deviation-Score Hypothesis 9

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Variability and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Unit Skill Heterogeneity (UNTHET_M)	M=6.3103 (n=15)	M=6.0339 (n=17)	M=5.9969 (n=12)
	F=.5617, p=0.5745		

Note: M = Mean of Service Quality Variable- **(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

q. <u>Congruence Hypothesis 10</u>. Congruence hypothesis 10 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in work flow interdependence within the unit (*P*) (more organic): independent work flow, to sequential work flow, to reciprocal work flow, to team work flow. See Table XLVIII for the results.

Table XLVIII Results of Congruence Hypothesis 10

Congruence Hypothesis: H_1: $0 < r_{UP} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Work Flow Interdependence Within Unit (NWWKFL) and:	
Task Difficulty	r=-.0269, p=.869, n=40
Task Variability	r=+.1901, p=.240, n=40
Task Uncertainty	r=+.0916, p=.574, n=40

Note: Marked correlations are significant at $p < .05$

r. Congruence Hypothesis 11. Congruence hypothesis 11 states that, if the work of an organizational unit increases in difficulty (*U*), then there is an increase in frequency of information flows of all kinds: among unit personnel written reports and memos, one-on-one discussions, and group meetings (*P*) (more organic). See Table XLIX for the results.

s. Deviation-Score Hypothesis 11. Deviation-score hypothesis 11 states that, given a value of difficulty of a unit's work, there is a matching value for unit communications (information flows) that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table L for the results.

Table XLIX Results of Congruence Hypothesis 11

Congruence Hypothesis: H_1: $0 < r_{UP} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Unit Communications (Information Flows) (INFLOW) and:	
Task Difficulty	r=**+.4796***, p=**.001**, n=48
Task Variability	r=**+.4399***, p=**.002**, n=48
Task Uncertainty	r=**+.5390***, p=**.000**, n=48

Note: Marked correlations are significant at p < .05

Table L Results of Deviation-Score Hypothesis 11

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Difficulty and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Unit Communications (Information Flows) (INFLOW)	M=6.4081 (n=13)	M=5.9641 (n=17)	M=6.0355 (n=14)
	F=1.0764, p=0.3502		

Note: M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

t. Congruence Hypothesis 12. Congruence hypothesis 12 states that, if the work of an organizational unit increases in task uncertainty (difficulty and variability), then there is an increase in the organic nature of its structure and processes (more organic). See Table LI for the results.

Table LI Results of Congruence Hypothesis 12

Congruence Hypothesis: H_1: $0 < r_{US} < 1$	Coefficient of Correlation (r), Significance Level (p), and Number of Cases (n)
Mechanistic-Organic Dimension (HIG_LOW2) and:	
Task Difficulty	r=+.2686, p=.065, n=48
Task Variability	r=**+.4114***, p=**.004**, n=48
Task Uncertainty	r=**+.3989***, p=**.005**, n=48

Note: Marked correlations are significant at $p < .05$

u. Deviation-Score Hypothesis 12. Deviation-score hypothesis 12 states that, given a value of task uncertainty (difficulty and variability) of a unit's work, there is a matching value for the overall unit structure and process dimension (mechanistic-organic scale) that will produce service levels the same as the customer's desired service level. Deviations above this relation (too organic) will produce service levels higher than the customer's desired service level. Deviations below this relation (too mechanistic) will produce service levels lower than the customer's desired service level. See Table LII for the results.

Table LII Results of Deviation-Score Hypothesis 12

Service Quality Outcomes for the Deviation-Score Hypothesis - Task Uncertainty and:	Goodness-of-Fit Work Units		
	Above Regression Line	Closest to Regression Line	Below Regression Line
Mechanistic-Organic Dimension (HIG_LOW2):	M=7.0325 (n=9)	M=5.9081 (n=29)	M=5.8199 (n=12)
	F=**8.7143**, p=**.0007**		

Notes: Marked correlations are significant at $p < .05$
M = Mean of Service Quality Variable-**(CSSERVWT)**
Service Level the Same as Desired => 6.3764 > M > 5.8569

v. Interaction Hypothesis 12. Interaction Hypothesis 12 states that: (12a) If a work unit is in an environment of high task uncertainty and is structured organically, then its customers will perceive services the same as their desired service level. (12b) If a work unit is in an environment of high task uncertainty and is structured mechanistically, then its customers will perceive services lower than their desired service level. (12c) If a work unit is in an environment of low task uncertainty and is structured mechanistically, then its customers will perceive services the same as their desired service level. (12d) If a work unit is in an environment of low task uncertainty and is structured organically, then its customers will perceive services higher than their desired service level. See Table LIII for the results.

Table LIII Results of Interaction Hypothesis 12

12a) High Task Uncertainty with an Organic Structure:

	Expected	Obtained
CSSERVQ:	5.8992 < M < 6.3842	M = 6.1170
CSSERVWT:	5.8569 < M < 6.3764	M = 6.1395
SERVQUAL:	6.1074 < M < 6.7296	M = 6.4675
OVERALSQ	5.8497 < M < 6.4151	M = 6.1356

12b) High Task Uncertainty with a Mechanistic Structure:

	Expected	Obtained
CSSERVQ:	M < 5.8992	M = 6.5824
CSSERVWT:	M < 5.8569	M = 6.5205
SERVQUAL:	M < 6.1074	M = 5.7861
OVERALSQ	M < 5.8497	M = 6.5328

12c) Low Task Uncertainty with a Mechanistic Structure:

	Expected	Obtained
CSSERVQ:	5.8992 < M < 6.3842	M = 5.6775
CSSERVWT:	5.8569 < M < 6.3764	M = 5.5893
SERVQUAL:	6.1074 < M < 6.7296	M = 6.0110
OVERALSQ	5.8497 < M < 6.4151	M = 5.7386

12d) Low Task Uncertainty with an Organic Structure:

	Expected	Obtained
CSSERVQ:	M > 6.3842	M = 6.3300
CSSERVWT:	M > 6.3764	M = 6.3056
SERVQUAL:	M > 6.7296	M = 6.7071
OVERALSQ	M > 6.4151	M = 6.2675

IV. DISCUSSION

A. DISCUSSION OF RESULTS

1. Discussion of Congruence Hypothesis 1. Congruence hypothesis 1 purports that, if the work of an organizational unit increases in variability, then there is a decrease unit standardization (more organic). The results are in the predicted direction and significant at the $p < .05$ level: $r=-.3601$, $p=.011$, $n=49$. This indicates that as the number of exceptions in the characteristics of work increases, then the extent to which rules, standard operating procedures, and performance expectations are formalized and followed to coordinate, control, and evaluate unit activities decreases. Unit standardization is also correlated with task uncertainty in the predicted direction and significant at the $p < .05$ level: $r=-.3532$, $p=.013$, $n=49$.

2. Discussion of Deviation-Score Hypothesis 1. The deviation-score hypothesis 1 purports that work units which lie above (too mechanistic), closest to, and below (too organic) the task variability-unit standardization regression line, will produce service levels that are lower than, the same as, or higher than, the customer's desired service levels, respectively. The results do not support this proposition: $F=0.08$, $p=0.923$.

3. Discussion of Congruence Hypothesis 2. Congruence hypothesis 2 purports that, if the work of an organizational unit increases in variability, then there is a decrease job

codification (more organic). The results are in the predicted direction and significant at the $p < .05$ level: $r=-.4046$, $p=.004$, $n=49$. This indicates that as the number of exceptions in the characteristics of work increases, then the extent to which rules define what the occupants of positions are to do, the degree to which job descriptions are specified, and the degree to which work is standardized decreases. Job codification is also correlated with task uncertainty in the predicted direction and significant at the $p < .05$ level: $r=-.3990$, $p=.005$, $n=49$.

4. Discussion of Deviation-Score Hypothesis 2. The deviation-score hypothesis 2 purports that work units which lie above (too mechanistic), closest to, and below (too organic) the task variability-job codification regression line, will produce service levels that are lower than, the same as, or higher than, the customer's desired service levels, respectively. The results do not support this proposition: $F=1.7896$, $p=0.9102$.

5. Discussion of Congruence Hypothesis 3. Congruence hypothesis 3 purports that, if the work of an organizational unit increases in variability, then there is a decrease rule observation (more organic). The results are in the predicted direction and significant at the $p < .05$ level: $r=-.3748$, $p=.008$, $n=49$. This indicates that as the number of exceptions in the characteristics of work increases, then the degree to which job occupants are supervised in conforming to the standards established by job codification decreases. Rule

observation is also correlated with task uncertainty in the predicted direction and significant at the $p < .05$ level: $r=-.2883$, $p=.045$, $n=49$.

6. Discussion of Deviation-Score Hypothesis 3. The deviation-score hypothesis 3 purports that work units which lie above (too mechanistic), closest to, and below (too organic) the task variability-rule observation regression line, will produce service levels that are lower than, the same as, or higher than, the customer's desired service levels, respectively. The results do not support this proposition: $F=1.0700$, $p=0.3523$.

7. Discussion of Congruence Hypothesis 4. Congruence hypothesis 4 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in participation in decision making (more organic). The results are in the predicted direction, but not significant at the $p < .05$ level: $r=+.2177$, $p=.133$, $n=49$. Participation in decision making is also correlated with task variability and task uncertainty in the predicted direction, but not significant at the $p < .05$ level: and $r=+.1939$, $p=.182$, $n=49$ and $r=+.2371$, $p=.101$, $n=49$, respectively.

8. Discussion of Deviation-Score Hypothesis 4. The deviation-score hypothesis 4 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-participation in decision making regression line, will produce service levels that are higher than, the same as, or lower than, the customer's

desired service levels, respectively. Since the task difficulty-participation in decision making regression line, from which residuals are calculated, was not significant, this hypothesis was not tested.

9. Discussion of Congruence Hypothesis 5. Congruence hypothesis 5 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in supervisor, unit employee, and collegial hierarchy of authority (more organic). The results are not significant at the $p < .05$ level: r=-.1181, p=.419, n=49; r=+.0350, p=.811, n=49; and r=-.2067, p=.154, n=49, respectively. However, unit employee hierarchy of authority is correlated with task variability in the predicted direction and significant at the $p < .05$ level: r=+.3139, p=.028, n=49. This indicates that as the number of exceptions in the characteristics of work increases, then the degree to which power, in the form of making work-related decisions, is distributed to the employee increases.

10. Discussion of Deviation-Score Hypothesis 5. The deviation-score hypothesis 5 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-supervisor, unit employee, and collegial hierarchy of authority regression lines, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. Since the task difficulty-supervisor, unit employee, and collegial hierarchy of authority regression

lines, from which residuals were calculated, are not significant these hypotheses were not tested. However, since the task variability-unit employee hierarchy of authority regression line was in the predicted direction and significant, a deviation-score hypothesis that purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task variability-unit employee hierarchy of authority regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively, was tested. The results do support this proposition: F=10.9742, p=0.0001. The mean of service quality variable CSSERVWT for the work units which lie above, closest to, and below the regression line are: 6.9256, 6.1017, and 5.5232, respectively. For the group of work units which are above the regression line, or have too much unit employee authority for their task environment, their customers perceive service levels which are higher than their desired service level. In other words, they are getting too much service. For the group of work units which are closest to regression line, or are correctly organized for their task environment, their customers perceive service levels which are the same as their desired service levels. And, for the group of work units which are below the regression line, or have too little unit employee authority for their task environment, their customers perceive service levels lower than their desired service levels. In other words, they are getting too little service.

11. Discussion of Congruence Hypothesis 6. Congruence hypothesis 6 purports that, if the work of an organizational unit increases in difficulty, then there is a decrease in external hierarchy of authority (more organic). The results are not significant at the $p < .05$ level: $r=+.0952$, $p=.515$, $n=49$.

12. Discussion of Deviation-Score Hypothesis 6. The deviation-score hypothesis 6 purports that work units which lie above (too mechanistic), closest to, and below (too organic) the task difficulty-external hierarchy of authority regression line, will produce service levels that are lower than, the same as, or higher than, the customer's desired service levels, respectively. Since the task difficulty-external hierarchy of authority regression line, from which residuals are calculated, was not significant, this hypothesis was not tested.

13. Discussion of Congruence Hypothesis 7. Congruence hypothesis 7 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in employee and supervisory discretion (more organic). The results are not significant at the $p < .05$ level: $r=+.0442$, $p=.763$, $n=49$, and $r=-.0837$, $p=.568$, $n=49$, respectively. However, employee discretion is correlated with task variability in the predicted direction and significant at the $p < .05$ level: $r=+.3155$, $p=.027$, $n=49$. This indicates that as the number of exceptions in the characteristics of work increases, then the amount of latitude unit members have in

making work related decisions increases. In addition, supervisory discretion is correlated with task variability in the opposite direction predicted and significant at the $p < .05$ level: $r=-.3273$, $p=.022$, $n=49$. This indicates that as the number of exceptions in the characteristics of work increases, then the amount of latitude the unit supervisor exercises in making work-related decisions decreases. An explanation of these results may be that discretion is being exercised or delegated to the employee level.

14. Discussion of Deviation-Score Hypothesis 7. The deviation-score hypothesis 7 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-employee and supervisory discretion regression lines, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. Since the task difficulty-employee and supervisory discretion regression lines, from which residuals are calculated, were not significant, this hypothesis was not tested. However, since the task variability-employee and supervisory discretion regression lines were significant, a deviation-score hypothesis was tested that purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task variability-employee and supervisory discretion regression lines, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. The results do not support this

proposition: F=0.4052, p=0.669 and F=2.2420, p=0.119, respectively.

15. Discussion of Congruence Hypothesis 8. Congruence hypothesis 8 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in role interchangeability in the unit. The results are not significant at the $p < .05$ level: r=+.0750, p=.609, n=49. However, role interchangeability in the unit is correlated with task variability in the opposite direction predicted and significant at the $p < .05$ level: r=-.2894, p=.044, n=49. This indicates that as the number of exceptions in the characteristics of work increases, then the degree to which A can perform B's job at short notice and B can perform A's job, even when A and B have different job titles or different functional assignments decreases. An explanation of these results is most likely due to the existence of variance in "type" of work each unit performs verses the number of exceptions encountered in the characteristics of the work. A greater variance in the "type" of work that the unit performs requires greater job specialization and hence decreased role interchangeability. Whereas, a greater number of exceptions encountered in the characteristics of the work requires greater job depth which allows more role interchangeability.

16. Discussion of Deviation-Score Hypothesis 8. The deviation-score hypothesis 8 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-role interchangeability

regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. Since the task difficulty-role interchangeability regression line, from which residuals are calculated, was not significant, this hypothesis was not tested. However, since the task variability-role interchangeability regression line was significant, a deviation-score hypothesis was tested that purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task variability-role interchangeability regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. The results do not support this proposition: F=2.0690, p=0.1392.

17. Discussion of Congruence Hypothesis 9. Congruence hypothesis 9 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in unit skill heterogeneity (more organic). The results are not significant at the $p < .05$ level: r=+.0455, p=.756, n=49. However, unit skill heterogeneity is correlated with task variability in the predicted direction and significant at the $p < .05$ level: r=+.3933, p=.005, n=49. This indicates that as the number of exceptions in the characteristics of work increases, then the range of different skills and competencies possessed by people in an organizational unit as a group increases.

18. Discussion of Deviation-Score Hypothesis 9. The deviation-score hypothesis 9 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-unit skill heterogeneity regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. Since the task difficulty-unit skill heterogeneity regression line, from which residuals are calculated, was not significant, this hypothesis was not tested. However, since the task variability-unit skill heterogeneity regression line was in the predicted direction and significant, a deviation-score hypothesis was tested that purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task variability-unit skill heterogeneity regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. The results do not support this proposition: $F=.5617$, $p=0.5745$.

19. Discussion of Congruence Hypothesis 10. Congruence hypothesis 10 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in work flow interdependence within the unit (more organic): independent work flow, to sequential work flow, to reciprocal work flow, to team work flow. The results are not significant at the $p < .05$ level: $r=-.0269$, $p=.869$, $n=49$.

20. Discussion of Deviation-Score Hypothesis 10. The deviation-score hypothesis 10 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-work flow interdependence regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. Since the task difficulty-work flow interdependence regression line, from which residuals are calculated, was not significant, this hypothesis was not tested.

21. Discussion of Congruence Hypothesis 11. Congruence hypothesis 11 purports that, if the work of an organizational unit increases in difficulty, then there is an increase in frequency of information flows of all kinds: among unit personnel written reports and memos, one-on-one discussions, and group meetings (more organic). The results are in the predicted direction and significant at the $p < .05$ level: $r=+.4796$, $p=.001$, $n=48$. This indicates that as the analyzability and predictability of the work undertaken by an organizational unit decreases (increased difficulty), then the work-related messages sent among unit personnel increases. The frequency of information flows is also correlated with task variability and task uncertainty in the predicted direction, and significant at the $p < .05$ level: and $r=+.4399$, $p=.002$, $n=48$, and $r=+.5390$, $p=.000$, $n=48$, respectively. This indicates that as the number of exceptions in the characteristics of work increases, then the work-related

messages sent among unit personnel increases. And as the combination of task difficulty and task variability (task uncertainty) increases, then the work-related messages sent among unit personnel increases.

22. Discussion of Deviation-Score Hypothesis 11. The deviation-score hypothesis 11 purports that work units which lie above (too organic), closest to, and below (too mechanistic) the task difficulty-frequency of information flows regression lines, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. The results do not support this proposition: $F=1.0764$, $p=0.3502$. Information flows are not visible to the customer and do not affect customer perceptions of service quality.

23. Discussion of Congruence Hypothesis 12. Congruence hypothesis 12 purports that, if the work of an organizational unit increases in task uncertainty (task difficulty and task variability), then there is an increase in the organic nature of a work unit's structure and processes (more organic). The results are in the predicted direction and significant at the $p < .05$ level: $r=+.3989$, $p=.005$, $n=48$. It should be noted that the correlation of task difficulty and task variability and a work unit's structure and processes is significant at the $p=.004$ and $p=.065$ level, respectively.

24. Discussion of Deviation-Score Hypothesis 12. The deviation-score hypothesis 12 purports that work units which lie above (too organic), closest to, and below (too

mechanistic) the task uncertainty-mechanistic organic regression line, will produce service levels that are higher than, the same as, or lower than, the customer's desired service levels, respectively. The results do support our hypothesis and are significant at the $p < .05$ level: $F=8.7143$, $p=0.0007$. The mean of service quality variable CSSERVWT for the work units which lie above, closest to, and below the regression line are: 7.0325, 5.9081, and 5.8199, respectively. For the group of work units which are above the regression line, or are too organic for their task environment, their customers perceive service levels which are higher than their desired service level. In other words, they are getting too much service. For the group of work units which are closest to regression line, or are correctly organized for their task environment, their customers perceive service levels which are the same as their desired service levels. And, for the group of work units which are below the regression line, or are too mechanistic for their task environment, their customers perceive service levels lower than their desired service levels. In other words, they are getting too little service.

25. Discussion of Interaction Hypothesis 12. The interaction hypothesis 12a purports that if a work unit is in an environment of high task uncertainty and is structured organically, then its customers will perceive services the same as their desired service level. The values of the means of CSSERVQ, CSSERVWT, and OVERALSQ for this group of work units, indicate service levels that are the same as the

customer's desired service levels; therefore, the results do support this proposition. The results suggest that the organic structure allows flexibility in the services provided that the uncertain task environment requires.

12a) High Task Uncertainty with an Organic Structure:

	Expected	Obtained
CSSERVQ:	5.8992 < M < 6.3842	M = 6.1170
CSSERVWT:	5.8569 < M < 6.3764	M = 6.1395
OVERALSQ	5.8497 < M < 6.4151	M = 6.1356

The interaction hypothesis 12b purports that if a work unit is in an environment of high task uncertainty and is structured mechanistically, then its customers will perceive services lower than their desired service level. The values of the means of CSSERVQ, CSSERVWT, and OVERALSQ for this group of work units, indicate service levels that are higher than the customer's desired service levels; therefore, the results do not support this proposition. One possible explanation of these results may be that the customer perceives the mechanistic structure, with it's rules and procedures, as providing service levels higher than their desired service level. This is in contrast to the customer perceiving flexibility, which is provided by an organic structure, as providing service levels higher than the customer's desired service level.

12b) High Task Uncertainty with a Mechanistic Structure:

	Expected	Obtained
CSSERVQ:	M < 5.8992	M = 6.5824
CSSERVWT:	M < 5.8569	M = 6.5205
OVERALSQ	M < 5.8497	M = 6.5328

The interaction hypothesis 12c purports that if a work unit is in an environment of low task uncertainty and is structured mechanistically, then its customers will perceive services the same as their desired service level. The values of the means of CSSERVQ and CSSERVWT for this group of work units, indicate service levels that are lower than the customer's desired service levels; therefore, the results do not support this proposition.

12c) Low Task Uncertainty with a Mechanistic Structure:

	Expected	Obtained
CSSERVQ:	5.8992 < M < 6.3842	M = 5.6775
CSSERVWT:	5.8569 < M < 6.3764	M = 5.5893
OVERALSQ	5.8497 < M < 6.4151	M = 5.7386

The interaction hypothesis 12d purports that if a work unit is in an environment of low task uncertainty and is structured organically, then its customers will perceive services higher than their desired service level. The values of the means of CSSERVQ and CSSERVWT for this group of work units, indicate service levels that are right at the point of being higher than the customer's desired service levels; therefore, the results tend toward support of this proposition.

12d) Low Task Uncertainty with an Organic Structure:

	Expected	Obtained
CSSERVQ:	M > 6.3842	M = 6.3300
CSSERVWT:	M > 6.3764	M = 6.3056
OVERALSQ	M > 6.4151	M = 6.2675

B. ADDITIONAL RESULTS, COMMENTS, AND DISCUSSION

Other results that warrant mention are as follows.

The service quality variable that was developed in this research, administered to customers, and measures service quality via one question, OVERALSQ, is highly correlated with Parasuraman, Zeithaml, and Berry's 1994 unweighted and weighted measures of service quality that were administered to customers, CSSERVQ and CSSERVWT: r=+.9189, p=.000, n=33; r=+.9197, p=.000, n=33; respectively.

The service quality variable that was developed in this research, administered to supervisors and unit members, and measures service quality via one question, SERVQUAL, is positively correlated with Parasuraman, Zeithaml, and Berry's 1994 unweighted and weighted measures of service quality that were administered to customers, CSSERVQ and CSSERVWT: r=+.3454, p=.049, n=33; r=+.3539, p=.043, n=33; respectively. In other words, supervisors and unit members know how their customers will rate the level of services they received.

The service quality variable that was developed in this research, administered to supervisors and unit members, and measures service quality via one question, SERVQUAL, is negatively correlated with how the customers perceive the nature of the work that is performed by the unit or task uncertainty (task difficulty and task variability): r=-.3770, p=.031, n=33. This suggests that as customers perceive the nature of the work that is performed by the unit increasing in difficulty and/or variability, then supervisors and unit members believe that those same customers will perceive the level of services provided as going from higher than, to the same as, to lower than their desired service level.

The weighted service quality variable, CSSERWWT, is positively correlated with the employee hierarchy of authority, AUTHOREM. This suggests that as the authority of the employee increase then the customers perceive the level of service provided as going from lower than, to the same as, to higher than their desired service level: r=+.3584, p=.041, n=33. An explanation of this may be that, as the authority of the employee increases, the employee is better able to provide the customer with services.

The overall mechanistic-organic variable, HIG_LOW2, is positively correlated with information flows, INFLOW: r=+.3992, p=.021, n=33. This suggests that as a structure becomes more organic, then the frequency of information flows of all kinds increases.

The degree of centralization variable, DEGRCENT, is positively correlated with information flows, INFLOW: r=+.5344, p=.001, n=33. This suggests that as decision making authority is delegated to the unit supervisors and unit employees, the frequency of information flows of all kinds increases.

Employee hierarchy of authority, AUTHOREM, is positively correlated with the customers' perception of responsiveness, RESP: r=+.3474, p=.048, n=33. This suggests that as decision making authority is delegated to the employees, the customers' perceptions of the employees' willingness to help them and provide prompt service goes from below, to the same as, to higher than their desired service level.

External Hierarchy of Authority, AUTHOREX, is negatively correlated with the customers' perception of reliability, RELBTY: r=-.3702, p=.034, n=33. This suggests that as decision making authority is shifted to external sources, customers' perceptions of the work units' reliability goes from higher than, to the same as, to lower than their desired service level.

Participation in Decision Making, DECMAKE, is positively correlated with information flows, INFLOW: r=+.6118, p=.000, n=33. This suggests that as unit supervisor and unit members increase their participation making decisions about the allocation of resources and the determination of organization policies, the frequency of information flows of all kinds increases.

Participation in Decision Making, DECMAKE, is positively correlated with the customers' perception of service quality as measured via one question, OVERALSQ: r=+.3527, p=.044, n=33. Participation in Decision Making, DECMAKE, is positively correlated with CSSERVQ and CSSERVWT, but at a lower significance level: r=+.3150, p=.074, n=33; r=+.3004, p=.089, n=33; respectively. This suggests that as unit supervisor and unit members increase their participation making decisions about the allocation of resources and the determination of organization policies, the customers' perceptions of service level goes from below, to the same as, to higher than their desired service level.

C. <u>SUMMARY AND CONCLUSIONS</u>

This research started with the problem statement: "Given a certain technology facing a work unit, is there a work unit structure/process that will maximize service quality to internal customers?" To this end, we developed and used an organizational assessment model which is a hybrid of the organic-mechanistic model, Van de Ven's (1976) model, and Van de Ven and Ferry's (1980) model. Forty-nine work units in the St. Louis District, U. S. Army Corps of Engineers, were used to test the relationships between technology, structure and processes, and service quality.

Fourteen congruent relationships were tested using simple regression, of which ten were found to be significant at the $p < .05$ level. Eight of the ten were in the predicted direction and support existing contingency theory (See Table LIV). We found that increased task difficulty matched with increased frequency of information flows (unit communications/information flows), and increased task variability matched with decreased unit standardization, decreased job codification, decreased rule observation, increased unit employee hierarchy of authority, increased employee discretion, decreased supervisory discretion, decreased role interchangeability in the unit, increased unit skill heterogeneity, increased frequency of information flows (unit communications/information flows), and increased organic nature of the work unit's structure and process (mechanistic-organic) dimensions. The two unexpected relations were decreased supervisory discretion and decreased role interchangeability matched with increased task variability.

From those eight significant contingent relationships that were in the predicted direction, the deviation-score approach to fit in contingency theory was tested using analysis of variance. Units grouped by deviation from the task variability-unit employee hierarch of authority and task uncertainty-mechanistic organic regression lines varied significantly on service quality in the predicted direction.

In addition, the interaction forms-of-fit was tested using task uncertainty and the mechanistic organic scale. One

Table LIV Structure and Process Variables Which Are Related to Task Uncertainty in the Predicted Direction and Support Existing Contingency Theory.

A. STRUCTURAL DIMENSIONS:

1. Formalization
   a. **Unit Standardization ***
   b. **Job Codification ***
   c. **Rule Observation ***
2. Centralization
   a. Participation in Decision Making
   b. Supervisor Hierarchy of Authority
   c. **Unit Employee Hierarchy of Authority ***
   d. Collegial Hierarchy of Authority
   e. External Hierarchy of Authority
   f. **Employee Discretion ***
   g. Supervisory Discretion
3. Complexity
   a. Role Interchangeability in Unit
   b. **Unit Skill Heterogeneity ***

B. PROCESSES WITHIN UNIT:

1. Work Flow Interdependence
2. **Frequency of Communications ***

C. **OVERALL MECHANISTIC-ORGANIC VARIABLE ***

Note: Marked Variables are Related to Task Uncertainty in the Predicted Direction and Significant of the four interaction hypotheses were in the predicted direction and significant. We found that if a work unit is in an environment of high task uncertainty and is structured organically, then its customers will perceive services the same as their desired service level.

In summary, this research provides additional support for the Contingency theory's ideas on formalization and centralization that: as technology moves from routine to nonroutine, subunits adopt a less formalized and centralized structure.

In addition, this research provides additional support for the common underlying premiss of the structural contingency management paradigm that context and structure must somehow "fit" together if an organization is to perform well. As to our problem statement, "Given a certain technology facing a work unit, is there a work unit structure/process that will maximize service quality to internal customers?", we can answer with a qualified "yes". Qualified, in the sense that the best determinant of a work unit's structure and processes, given a certain task environment, is the task uncertainty-mechanistic organic regression line and the fact that there are numerous combinations of structure and process dimension values that can produce each value on the mechanistic organic scale. Therefore, this indicates that equalfinality is true or, given a certain task environment, there are more than one structure/process combinations which produce a certain level of service quality. Using the task uncertainty-mechanistic organic regression line to determine the best structure/process combination is essentially a "systems" approach to fit using the structural contingency management paradigm where the mechanistic organic value is our "structural/process" latent variable.

There is one bi-variate analysis using the deviation-score approach to fit in contingency theory that predicted desired service levels. Units grouped by deviation from the task variability-unit employee hierarchy of authority regression lines varied significantly on service quality in the predicted direction.

D. LIMITATION OF THIS STUDY

Perhaps the most arguable limitation of this study is the generalizability of its results due to the limited variance of the work unit context, structure, and process variables due to the work units all being drawn from the same parent organization.

E. IMPLICATIONS OF THIS STUDY

The main implication of this study is that there are practical benefits in combining organizational design theory and service quality theory. Companies are constantly required to obtain and/or maintain a competitive advantage and differentiate themselves from their competitors. Many companies are doing this by focusing on and advertising the quality of their services. Managers of these companies have a need to measure and monitor their organization's context (technology), structure and processes in an effort to optimize its output; in this case, service quality. They have a need to know how these variables affect one another and service quality. They have a need to know the feasible set of organizational designs that are equally effective for different context configurations and to understand which patterns of organizational designs are internally consistent in producing services levels that are the same as the customer's desired service levels. This research has shown that service quality can be managed through the use of; existing organizational concepts and variables, existing organizational design models, and existing organizational design knowledge. Specifically, this research has shown that the "fit" between a work unit's context and employee hierarchy of authority and the overall mechanistic organic nature has an effect on customer perceptions of service. This gives managers the knowledge and tools to control and manipulate a major output of today's society: service.

APPENDIX A.

ORGANIZATIONAL STRUCTURE

U.S. ARMY CORPS OF ENGINEERS

U.S. Army Corps of Engineers is a complex engineering organization with multiple responsibilities requiring extensive design, engineering, and construction expertise. It is the country's largest engineering organization employing 40,000 people. It is a major engineering resource for the country, charged with managing a key program in water resource development and supporting the construction requirements of the U.S. Army and our Nation. Its main civil works mission include navigation, flood control, hydropower, water supply, recreation, fish and wildlife management, regulation of the use of the nation's waterways, and wetlands and environment management.

The U.S. Army Corps of Engineers is part of the Department of Defense, under the Secretary of the Army. The Corps of Engineers was the only source of trained engineers in the early days of the country with West Point being the only engineering school. The Corps of Engineers was given responsibility for navigation in 1824, flood control in 1936, and Army construction in 1941. The Corps of Engineers is the real estate agent for the Army and Air Force; acquiring, managing, and disposing of land for military and civil works programs. The Army manages 24 million acres of land.

ST. LOUIS DISTRICT, U.S. ARMY CORPS OF ENGINEERS

The St. Louis District, U.S. Army Corps of Engineers began in 1837 under Robert E. Lee. Lee's mission was to save the St. Louis harbor. The District was officially organized in 1872 and is composed of 28,000 square miles of land, 48,000 miles of waterways, 7 major rivers besides the Mississippi River, 5 lakes, and 5 locks.

The District's mission is to manage and execute engineering, environmental, real estate, research and development, and construction programs to support the Nation, the Army, and the Department of Defense during times of peace and national emergency. Inherent in this mission, is providing quality products and services on time and within budget, with full regard for the needs and preferences of customers and consistent with environmental values and the highest standards of professional integrity and excellence.

*** INDICATES WORK UNITS THAT WERE SELECTED FOR TESTING**

Executive Office

Resource Management Office

* * Budget and Manpower Branch (RM-B)
* * Finance and Accounting Branch (RM-F)

Logistics Management Office

* * Supply Branch (LM-S)
* * Transportation, Maintenance, & Facilities Branch (LM-T)

* Safety and Occupational Health Office (SO)

* Public Affairs Office (PA)

* Equal Employment Opportunity (EE)

* Office of Counsel (OC)

* Internal Review Office (IR)

* Security Office (DS)

Information Management Office

* * Integration and Implementation Branch (IM-I)
* * Planning and Services Branch (IM-P)

Human Resources Office

* * Training and Development Branch (HR-T)
* * Management-Employee Relations Branch (HR-M)
* * Position Management & Classification Branch (HR-P)
* * Recruitment & Employment Services Branch (HR-R)
* * Position Management & Classification Branch (HR-P)

<u>Construction-Operations Readiness Division</u>

Construction Branch

* Contract Administration Section (CO-CC)

* Quality Assurance Section (CO-CQ)

* Regulatory Branch (CO-F)

* Con-Ops Management Branch (CO-M)

* Readiness Branch (CO-R)

Operations Technical, Policy, & Physical Support Branch

* Technical Operations Section (CO-TO)

* Plant Engineering & Inspection Unit (CO-TS)

<u>Engineering Division</u>

Cost Engineering Branch

* Cost Engineering Section (ED-CE)

* Contract & Resource Management Section (ED-CC)

Design Branch

* Structural/Architectural Section (ED-DA)

* Civil Engineering Section (ED-CE)

* Mechanical/Electrical Section (ED-DM)

Geotechnical Branch

* Geology Section (ED-GG)

* Foundations Section (ED-GF)

* Embankment & Materials Section (ED-GE)

Hydrologic and Hydraulics Branch

* Hydrologic Engineering Section (ED-HE)

* Geodesy Cartography & Photogrammetry Sect. (ED-HG)

* Potomology Section (ED-HP)

* Environmental Quality Section (ED-HQ)

<u>Contracting Division</u>

* Contracts Branch (CT-C)
* Procurement Branch (CT-P)

<u>Real Estate Division</u>

* Acquisition Branch (RE-A)
* Appraisal/Planning & Control Branch (RE-E)
* Management & Disposal Branch (RE-M)

<u>Programs and Project Management Division</u>

* Project Management Branch (PM-M)
* Programs Management Branch (PM-P)

<u>Planning Division</u>

* Plan Formulation Branch (PD-F)
* Curation & Archives Analysis Branch (PD-C)
* Environmental Planning Branch (PD-A)
* Economic & Social Analysis Branch (PD-E)
* Military Research Branch (PD-R)

<u>Cooperative Administrative Support Unit</u>

* Library & Information Services Division (CASU-DL)
* Support Services (CASU-DS)

DISTRICT FIELD OFFICES

Carlyle Lake Project Office

Mark Twain Lake Project Office

Rend Lake Project Office

Lake Shelbyville Project Office

Wappapello Lake Project Office

Rivers Project Office

LOCKS AND DAMS

Rivers Project Office

Lock and Dam No. 24

Lock and Dan No. 25

Lock No. 27

Melvin Price Locks and Dam

Kaskaskia Lock and Dam

FIELD OFFICES

Greater St. Louis Area Office

Environmental Resident Office

Metropolitan St. Louis Resident Office

Melvin Price Resident Office

Lower Mississippi River Resident Office

Upper Mississippi River Resident Office

OTHER FIELD OFFICES

Dredge Potter

Power Plant

Patrolboat Pathfinder

Patrolboat Simpson

Rivers Project Office

West Alton Sub Office

Clarksville Sub Office

Clarence Cannon Power Plant

APPENDIX B.

CALCULATED VARIABLES

VARIABLE SPECIFICATIONS

SERVQUAL; Service Quality-Unit Perceptions

TASKDIF; Task Difficulty-Unit Perceptions

TASKVAR; Task Variability-Unit Perceptions

TASKUNCR; Task Uncertainty-Unit Perceptions

UNTSTD; Unit Standardization-Unit Perceptions

JOBCODIF; Job Codification-Unit Perceptions

RULEOBSR; Rule Observation-Unit Perceptions

DEGRFORM; Degree of Formalization-Unit Perceptions

DECMAKE; Participation in Decision Making-Unit Perceptions

AUTHORSU; Authority-Supervisory-Unit Perceptions

AUTHOREM; Authority-Employee-Unit Perceptions

AUTHORCO; Authority-Collegial-Unit Perceptions

AUTH; Authority-Unit Perceptions

AUTHOREX; Authority-External-Unit Perceptions

EMPDIS; Employee Discretion-Unit Perceptions

SUPDIS; Supervisory Discretion-Unit Perceptions

DEGDCENT; Degree of Decentralization-Unit Perceptions

ROLEINT; Role Interchangeability-Unit Perceptions

UNTHET_M; Unit Skill Heterogeneity-Unit Perceptions

UNTHET_S; Unit Skill Heterogeneity (Standard Deviation)

WKFLOW; Work Flow Interdependence-Unit Perceptions

NWWKFL; Work Flow Interdependence (Non-Weighted)

INFLOW; Information Flows-Unit Perceptions

OVERALSQ; Service Quality-Customer Perceptions

VARIABLE SPECIFICATIONS (CONTINUED)

RELBTY; Reliability-Customer Perceptions.

RESP; Responsiveness-Customer Perceptions.

ASSUR; Assurance-Customer Perceptions.

EMPTHY; Empathy-Customer Perceptions.

TANG; Tangibles-Customer Perceptions.

CSSERVQ; Service Quality (Calculated, Non-weighted)-Customer Perceptions.

CSSERVWT; Service Quality (Calculated, Weighted)-Customer Perceptions.

CSTSDIF; Task Difficulty-Customer Perceptions.

CSTSVAR; Task Variability-Customer Perceptions.

CSTASKUN; CSTSDIF + CSTSVAR; Task Uncertainty-Customer Perceptions.

HIG_LOW2; Mechanistic-Organic Variable.

TASKUN; If TASKUNCR < 2.5, then TASKUN = 0; If TASKUNCR > 2.5, then TASKUN = 1.

H_L2; If HIG_LOW2 < 32.66, then H_L2 = 0: If HIG_LOW2 > 32.66, then H_L2 = 1.

QUAD; If TASKUN = 0 and H_L2 = 0 then QUAD = 1;
If TASKUN = 1 and H_L2 = 0 then QUAD = 2;
If TASKUN = 1 and H_L2 = 1 then QUAD = 3;
If TASKUN = 0 and H_L2 = 1 then QUAD = 4;

DEVDEGFM; DEGRFORM - (3.2124 - 0.3321 * TASKVAR); Deviation from the Degree of Formalization/Task VariabIlity regression line.

VARIABLE SPECIFICATIONS (CONTINUED)

GRPDEVDF; If DEVDEGFM < -.2 then GRPDEVDF = 1; If DEVDEGFM > -.2 and DEVDEGFM < .2 then GRPDEVDF = 2; If DEVDEGFM > .2 then GRPDEVDF = 3.

DEVINFL; INFLOW - (2.4089 + 0.34966 * TASKDIF); Deviation from the Information Flow/Task Difficulty regression line.

GRPDVINF; If DEVINFL < -.19 then GRPDVINF = 1; DEVINFL > -.19 and DEVINFL < .19 then GRPDVINF = 2; If DEVINFL > .19 then GRPDVINF = 3.

DEVJBCD; JOBCODIF - (3.4426 - 0.3083 * TASKVAR); Deviation from the Job Codification/Task Variability regression line.

GRPDVJCD; If DEVJBCD < -.2 then GRPDVJCD = 1; If DEVJBCD > -.2 and DEVJBCD < .2 then GRPDVJCD = 2; If DEVJBCD > .2 then GRPDVJCD = 3.

SUBQUAD; Quadrants subdivided by + or - standard error of mean 6.116627 (+ or - (0.2597)).

QUAD3; If QUAD = 2 then QUAD3 = 2, If QUAD = 1 or 3 then QUAD3 = 1, If QUAD = 4 then QUAD3 = 4.

DEVHI_LO; HIG_LOW2 - (27.967 + 2.2427 * TASKUNCR); Deviation from the Mechanistic-Organic/Task Uncertainty regression line.

GRPDEVHL; If DEVHI_LO < -2 then GRPDEVHL = 1; If DEVHI_LO > -2 and DEVHI_LO < 2 then GRPDEVHL = 2; If DEVHI_LO > 2 then GRPDEVHL = 3.

VARIABLE SPECIFICATIONS (CONTINUED)

DEVUNSTD; UNTSTD - (4.3158 - 0.3614 * TASKVAR); Deviation from the Unit Standardization/Task Variability regression line.

GRPDEVUN; If DEVUNSTD < -0.3 then GRPDEVUN = 1; If DEVUNSTD > -0.3 and DEVUNSTD < 0.3 then GRPDEVUN = 2; If DEVUNSTD > 0.3 then GRPDEVUN = 3.

DEVRLOB; RULEOBSR - (2.6883 - 0.3718 * TASKVAR); Deviation from the Rule Observation/Task Variability regression line.

GRPDEVRO; If DEVRLOB < -.2 then GRPDEVRO = 1; If DEVRLOB > -.2 and DEVRLOB < .2 then GRPDEVRO = 2; If DEVRLOB > .2 then GRPDEVRO = 3.

DEVAUEM; AUTHOREM - (1.8806 + 0.296 * TASKVAR); Deviation from Employee Hierarchy of Authority/Task Variability regression line.

GRPDEVAE; If DEVAUEM < -.3 then GRPDEVAE = 1; If DEVAUEM > -.3 and DEVAUEM < .3 then GRPDEVAE = 2; DEVAUEM > .3 then GRPDEVAE = 3

DEVEMDS; EMPDIS - (2.5497 + 0.3539 * TASKVAR); Deviation from Employee Discretion/Task Variability regression line.

GRPDEVED; If DEVEMDS < -.3 then GRPDEVED = 1; If DEVEMDS > -.3 and DEVEMDS < .3 then GRPDEVED = 2; If DEVEMDS > .3 then GRPDEVED = 3.

VARIABLE SPECIFICATIONS (CONTINUED)

DEVSUDS; SUPDIS - (4.5061 - 0.3571 * TASKVAR); Deviation from Supervisory Discretion/Task Variability regression line.

GRPDEVSD; If DEVSUDS < -.3 then GRPDEVSD = 1; If DEVSUDS > -.3 and DEVSUDS < .3 then GRPDEVSD = 2; If DEVSUDS > .3 then GRPDEVSD = 3.

DEVRLIN; ROLEINT - (3.8897 - 0.3869 * TASKVAR); Deviation from Role Interchangeability/Task Variability regression line.

GRPDEVRN; If DEVRLIN < .3 then GRPDEVRN = 1; If DEVRLIN > -.3 and DEVRLIN < .3 then GRPDEVRN = 2; If DEVRLIN > .3 then GRPDEVRN = 3.

DEVUNHM; UNTHET_M - (1.4193 + 0.60155 * TASKVAR); Deviation from Unit Skill Heterogeneity/Task Variability regression line.

GRPDEVUH; If DEVUNHM < -.3 then GRPDEVUH = 1; If DEVUNHM > -.3 and DEVUNHM < .3 then GRPDEVUH = 2; If DEVUNHM > .3 then GRPDEVUH = 3.

DEVINFL; INFLOW - (2.2089 + 0.42076 * TASKDIF); Deviation from Information Flows/Task Variability regression line.

GRPDEVIF; If DEVINFL < -.2 then GRPDEVIF = 1; If DEVINFL > -.2 and DEVINFL < .2 then GRPDEVIF = 2; If DEVINFL > .2 then GRPDEVIF = 3.

VALUES OF CALCULATED VARIABLES FOR WORK UNITS

UNIT	SERVQUAL	TASKDIF	TASKVAR	TASKUNCR	UNTSTD
CASU-DL	6.666667	1.375000	2.333333	1.854167	2.966667
CASU-DS	7.750000	1.375000	2.625000	2.000000	4.050000
CO-CC	4.900000	2.475000	2.375000	2.425000	2.733333
CO-CQ	5.200000	2.475000	2.700000	2.587500	2.733333
CO-F	6.600000	3.583333	3.375000	3.479167	3.438889
CO-M	7.500000	2.125000	2.375000	2.250000	3.000000
CO-R		2.000000	2.250000	2.125000	4.200000
CO-TO	4.666667	2.583333	3.500000	3.041667	1.966667
CO-TS	6.071429	1.765625	2.890625	2.328125	2.941667
CT-C	4.500000	1.250000	1.583333	1.416667	4.222222
CT-P	4.600000	1.700000	3.100000	2.400000	4.185185
DS	7.000000	1.750000	3.000000	2.375000	3.600000
ED-CC	5.750000	2.437500	2.437500	2.437500	2.866667
ED-CE	6.500000	1.750000	2.875000	2.312500	2.933333
ED-DA	6.333333	2.062500	2.458333	2.260417	3.238889
ED-DC	7.071429	2.053571	2.642857	2.348214	3.057143
ED-DM	8.000000	2.250000	3.750000	3.000000	2.000000
ED-GE	6.500000	2.375000	3.833333	3.104167	2.744444
ED-GF	7.111111	2.450000	3.550000	3.000000	2.733333
ED-GG	6.250000	2.093750	3.312500	2.703125	2.883333
ED-HE	5.000000	2.750000	2.750000	2.750000	3.044444
ED-HG	5.944444	2.325000	3.262500	2.793750	3.150000
ED-HP	6.500000	1.500000	3.312500	2.406250	3.583333
ED-HQ	6.750000	1.625000	2.900000	2.343750	3.266667
EE		1.750000	2.583333	2.166667	3.622222
HR-M	7.000000	2.375000	3.125000	2.750000	3.900000
HR-P	8.000000	1.812500	3.187500	2.500000	3.400000
HR-R	7.555556	2.650000	2.900000	2.775000	3.466667
HR-T	8.000000	1.250000	3.000000	2.125000	2.800000
IM-I	6.500000	1.854167	2.958333	2.406250	3.277778
IM-P	7.200000	1.708333	3.458333	2.583333	3.177778
IR	9.000000	1.000000	2.500000	1.750000	4.400000
LM-S	5.500000	1.833333	2.500000	2.166667	3.666667
LM-T	7.666667	1.916667	2.333333	2.125000	3.711111
OC	6.692308	2.428571	3.446429	2.937500	3.133333
PA	8.000000	2.250000	4.750000	3.500000	2.600000
PD-A	4.105263	2.262500	2.962500	2.612500	2.583333
PD-C	7.000000	1.943182	2.784091	2.363636	3.775758
PD-E	6.000000	1.875000	2.906250	2.390625	3.125000
PD-F	4.800000	3.208333	3.125000	3.166667	2.605556
PD-R	6.923077	1.750000	2.607143	2.178571	3.047619
PM-M	6.333333	1.812500	2.640625	2.226563	3.577778
PM-P	6.000000	1.687500	2.375000	2.031250	3.466667
RE-A					
RE-E	6.000000	3.500000	4.000000	3.750000	4.000000
RE-M	6.000000	2.000000	2.750000	2.375000	3.600000
RM-B	6.000000	3.000000	3.000000	3.000000	4.000000
RM-F	6.000000	1.416667	2.166667	1.791667	2.888889
SO	6.000000	2.250000	3.500000	2.875000	3.000000
All Grps	6.227891	2.147529	2.919331	2.534985	3.180254

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	JOBCODIF	RULEOBSR	DEGRFORM	DECMAKE	AUTHORSU
CASU-DL	2.366667	1.250000	2.150000	3.000000	4.125000
CASU-DS	2.600000	2.000000	2.713889	2.750000	4.000000
CO-CC	2.160000	1.450000	2.008889	2.575000	3.435185
CO-CQ	3.260000	2.900000	2.892222	1.925000	2.900000
CO-F	2.066667	1.458333	2.223611	3.625000	4.125000
CO-M	2.200000	1.000000	1.983333	2.000000	3.500000
CO-R	2.800000	2.000000	2.877778	4.500000	3.500000
CO-TO	2.433333	1.416667	1.963889	2.500000	3.527778
CO-TS	2.775000	1.531250	2.369444	2.183333	4.022222
CT-C	3.533333	3.000000	3.427778	1.000000	5.000000
CT-P	2.720000	3.200000	3.252469	2.675000	4.611111
DS	3.100000	1.750000	2.644444	3.750000	4.291667
ED-CC	2.533333	2.000000	2.409259	3.500000	2.958333
ED-CE	2.300000	1.250000	2.127778	3.250000	3.750000
ED-DA	2.583333	1.500000	2.239394	2.458333	3.803030
ED-DC	2.000000	1.142857	1.996032	3.000000	3.750000
ED-DM	1.800000	1.000000	1.600000	1.500000	3.000000
ED-GE	2.466667	1.333333	2.141667	2.541667	3.916667
ED-GF	2.380000	1.100000	2.018333	3.575000	4.500000
ED-GG	2.600000	1.500000	2.252083	1.968750	4.375000
ED-HE	2.400000	1.333333	2.147222	1.666667	4.416667
ED-HG	2.220000	1.300000	2.265000	3.325000	4.166667
ED-HP	2.150000	1.125000	2.175000	3.312500	4.083333
ED-HQ	2.160000	1.000000	2.070000	1.700000	4.133333
EE	3.600000	2.000000	2.951852	3.500000	4.125000
HR-M	2.600000	1.500000	2.533333	3.000000	4.333333
HR-P	2.750000	1.125000	2.291667	3.250000	4.541667
HR-R	2.740000	2.650000	2.863333	3.325000	4.633333
HR-T	2.400000	2.000000	2.355556	3.500000	3.750000
IM-I	2.550000	1.708333	2.419444	2.687500	4.319444
IM-P	1.800000	1.250000	2.016667	3.500000	4.388889
IR	3.200000	1.500000	2.900000	5.000000	4.750000
LM-S	3.200000	2.666667	3.038889	1.416667	4.000000
LM-T	3.033333	1.833333	2.747222	3.041667	3.944444
OC	2.214286	1.071429	2.053571	3.714286	4.559524
PA	2.200000	1.000000	1.900000	2.500000	4.000000
PD-A	2.790000	1.250000	2.171667	3.137500	3.741667
PD-C	3.118182	1.954545	2.834921	3.477273	4.553030
PD-E	2.400000	1.375000	2.230556	2.687500	3.833333
PD-F	2.166667	1.666667	2.125000	3.020833	3.750000
PD-R	2.028571	1.464286	2.128571	2.607143	3.702381
PM-M	2.400000	1.375000	2.356667	2.066667	4.270833
PM-P	2.600000	1.750000	2.505556	3.250000	4.750000
RE-A					
RE-E	2.400000	2.000000	2.688889	5.000000	4.250000
RE-M	3.000000	1.700000	2.650000	2.400000	3.733333
RM-B	2.400000	1.000000	2.355556	5.000000	5.000000
RM-F	2.066667	1.333333	2.050000	1.666667	3.555556
SO	2.600000	1.000000	2.144444	2.750000	3.250000
All Grps	2.526727	1.600291	2.355420	2.862245	4.063783

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	AUTHOREM	AUTHORCO	AUTH	AUTHOREX	EMPDIS
CASU-DL	3.638889	3.541667	3.768519	2.208333	4.000000
CASU-DS	2.833333	3.708333	3.513889	4.083333	3.187500
CO-CC	1.783333	1.907407	2.404321	2.546296	3.350000
CO-CQ	2.400000	2.400000	2.566667	2.533333	2.525000
CO-F	2.944444	3.291667	3.453704	2.680556	4.208333
CO-M	2.333333	2.166667	2.666667	3.500000	4.750000
CO-R	2.750000	3.250000	3.166667	3.750000	2.750000
CO-TO	3.347222	2.388889	3.087963	2.888889	4.416667
CO-TS	2.866667	3.200000	3.362963	3.622222	3.066667
CT-C	2.111111	2.777778	3.296296	1.888889	2.083333
CT-P	2.194444	1.731481	2.845679	2.879630	3.638889
DS	2.791667	3.708333	3.597222	1.875000	3.375000
ED-CC	2.041667	2.708333	2.569444	3.625000	3.812500
ED-CE	2.083333	2.583333	2.805556	2.708333	2.875000
ED-DA	2.878788	2.757576	3.146465	2.515152	3.437500
ED-DC	2.827381	2.636905	3.071429	3.565476	3.982143
ED-DM	2.333333	1.333333	2.222222	3.333333	4.500000
ED-GE	2.583333	2.972222	3.157407	2.611111	3.666667
ED-GF	3.916667	4.008333	4.141667	2.808333	4.600000
ED-GG	2.000000	3.500000	3.291667	2.833333	3.343750
ED-HE	3.472222	2.791667	3.560185	2.777778	3.875000
ED-HG	3.758333	2.083333	3.336111	3.250000	3.650000
ED-HP	2.833333	2.916667	3.277778	3.000000	3.687500
ED-HQ	2.800000	3.466667	3.466667	2.666667	3.600000
EE	2.083333	3.000000	3.069444	3.416667	3.437500
HR-M	3.500000	3.458333	3.763889	3.625000	3.750000
HR-P	2.833333	3.041667	3.472222	3.000000	3.562500
HR-R	3.275000	3.191667	3.700000	3.000000	3.500000
HR-T	3.250000	3.250000	3.416667	2.750000	3.500000
IM-I	3.027778	2.486111	3.277778	3.055556	3.750000
IM-P	3.611111	3.333333	3.777778	2.819444	4.416667
IR	3.000000	3.250000	3.666667	3.500000	3.000000
LM-S	2.444444	2.777778	3.074074	3.222222	3.666667
LM-T	2.736111	2.777778	3.152778	3.388889	3.750000
OC	2.851190	2.488095	3.299603	2.958333	3.285714
PA	3.500000	3.000000	3.500000	3.500000	5.000000
PD-A	2.408333	2.550000	2.900000	3.525000	3.837500
PD-C	2.651515	2.715909	3.306818	3.341270	2.738636
PD-E	2.291667	2.875000	3.000000	3.958333	3.250000
PD-F	2.402778	2.500000	2.884259	3.000000	3.409091
PD-R	3.125000	2.827381	3.218254	3.214286	4.214286
PM-M	2.895833	3.458333	3.541667	2.977778	4.250000
PM-P	2.333333	2.041667	3.041667	3.250000	3.687500
RE-A					
RE-E	2.250000	2.000000	2.833333	4.000000	2.500000
RE-M	2.266667	3.066667	3.022222	3.466667	2.950000
RM-B	3.000000	2.500000	3.500000	4.500000	2.750000
RM-F	2.111111	1.666667	2.444444	4.500000	4.333333
SO	2.500000	3.250000	3.000000	2.750000	3.250000
All Grps	2.806287	2.794721	3.223363	3.101331	3.607038

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	SUPDIS	DEGDCENT	ROLEINT	UNTHET_M	UNTHET_S
CASU-DL	3.541667	3.577546	1.944444	3.833333	1.005540
CASU-DS	3.250000	3.175347	3.250000	1.416667	.500000
CO-CC	3.200000	2.906636	3.966667	2.700000	.792714
CO-CQ	2.775000	2.447917	3.833333	2.966667	.576280
CO-F	3.208333	3.623843	3.500000	3.666667	.816497
CO-M	3.750000	3.291667	4.333333	2.166667	.235702
CO-R	4.250000	3.666667	2.666667	2.666667	0.000000
CO-TO	2.916667	3.230324	2.444444	2.611111	.443053
CO-TS	3.500000	3.043155	2.375000	2.476190	.802925
CT-C	4.916667	2.824074	2.444444	1.222222	.693889
CT-P	3.305556	3.162809	3.666667	2.333333	.666667
DS	4.625000	3.836806	2.000000	3.166667	1.649916
ED-CC	3.187500	3.267361	2.333333	3.500000	1.261980
ED-CE	3.750000	3.170139	4.500000	3.500000	.235702
ED-DA	3.812500	3.172980	3.472222	3.472222	.936988
ED-DC	3.071429	3.281250	2.500000	2.976190	.672593
ED-DM	2.250000	2.618056	2.666667	2.666667	0.000000
ED-GE	2.875000	3.060185	2.666667	3.866667	.298142
ED-GF	3.850000	4.041667	3.066667	4.233333	.930286
ED-GG	3.843750	3.111979	2.458333	4.083333	.921524
ED-HE	3.500000	3.150463	3.222222	3.722222	.998146
ED-HG	3.100000	3.352778	3.466667	3.050000	.498829
ED-HP	3.000000	3.319444	1.583333	4.166667	.962250
ED-HQ	2.950000	2.929167	1.833333	3.083333	.419435
EE	3.750000	3.439236	2.916667	2.000000	0.000000
HR-M	4.375000	3.722222	2.500000	2.333333	.471405
HR-P	3.375000	3.414931	2.416667	3.500000	.333333
HR-R	4.200000	3.681250	2.966667	2.166667	.971825
HR-T	3.000000	3.354167	3.000000	3.000000	0.000000
IM-I	3.791667	3.376736	2.250000	3.472222	.744791
IM-P	2.875000	3.642361	2.277778	4.333333	1.520234
IR	4.750000	4.104167	2.333333	3.000000	0.000000
LM-S	3.833333	2.997685	1.666667	2.888889	1.835857
LM-T	3.166667	3.277778	3.000000	2.666667	.843274
OC	4.017857	3.579365	3.238095	4.538462	.714123
PA	2.500000	3.375000	1.000000	4.333333	0.000000
PD-A	3.587500	3.365625	2.316667	4.000000	.725476
PD-C	3.977273	3.375000	3.393939	4.181818	1.067694
PD-E	3.500000	3.109375	2.541667	4.708333	1.090180
PD-F	3.204545	3.155934	2.722222	3.000000	1.294901
PD-R	2.660714	3.175099	4.142857	4.238095	1.016350
PM-M	3.250000	3.182540	2.979167	3.377778	.785450
PM-P	3.437500	3.354167	2.666667	3.666667	1.276569
RE-A					
RE-E	3.750000	3.520833	1.666667	2.000000	0.000000
RE-M	3.800000	3.043056	2.333333	2.866667	.649786
RM-B	3.750000	3.750000	2.000000	2.333333	0.000000
RM-F	2.083333	2.631944	2.555556	2.111111	.192450
SO	3.000000	3.000000	3.000000	4.333333	0.000000
All Grps	3.437865	3.282414	2.934698	3.372665	1.112549

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	WKFLOW	NWWKFL	INFLOW	OVERALSQ	RELBTY
CASU-DL	3.980000	10.00000	2.537037	7.453608	6.934370
CASU-DS	6.630000	13.00000	2.805556	5.615385	5.213504
CO-CC	1.990000	8.00000	3.377778	5.000000	6.000000
CO-CQ	3.980000	8.00000	2.066667	7.000000	6.933333
CO-F	1.990000	8.00000	3.740741	5.659091	5.649022
CO-M			2.500000	6.000000	6.059884
CO-R	3.640000	11.00000	3.333333		
CO-TO	3.980000	10.00000	3.574074		
CO-TS	5.640000	11.00000	2.152778	5.861111	5.281072
CT-C			1.592593	5.677419	5.717404
CT-P	3.320000	9.00000	2.711111	6.338462	6.219034
DS	2.990000	9.00000	3.333333	6.433333	6.006667
ED-CC	4.310000	10.00000	3.277778	6.866667	6.160000
ED-CE	4.630000	12.00000	2.666667	5.941176	5.794118
ED-DA	5.300000	12.00000	2.851852	6.264706	6.181122
ED-DC	3.970000	8.00000	2.825397	6.200000	5.413295
ED-DM			3.000000	7.000000	6.000000
ED-GE	7.960000	16.00000	3.111111	5.000000	5.730543
ED-GF	6.300000	13.00000	3.255556	7.000000	6.800000
ED-GG	3.650000	8.00000	2.902778		
ED-HE	3.310000	9.00000	2.685185	6.555556	6.355556
ED-HG	5.970000	10.00000	3.355556	6.733333	6.493333
ED-HP			2.962963	5.692308	6.538462
ED-HQ			2.805556	6.545455	5.327273
EE	3.970000	10.00000	3.527778	5.428571	5.202741
HR-M	6.970000	13.00000	3.722222	7.000000	6.600000
HR-P	3.650000	9.00000	3.194444	6.210526	6.684211
HR-R	4.980000	11.00000	3.566667	6.080000	5.995163
HR-T	5.970000	12.00000	3.666667	8.000000	8.400000
IM-I	3.980000	10.00000	3.212963	4.750000	4.466570
IM-P	3.980000	8.00000	3.370370	8.000000	7.800000
IR	1.990000	4.00000	3.222222	7.062500	6.962500
LM-S			2.444444	6.693548	6.576220
LM-T	1.990000	8.00000	3.240741	6.484848	6.418693
OC	4.980000	10.00000	3.150794	7.210526	6.463158
PA	3.310000	10.00000	3.333333	3.571429	3.956980
PD-A	5.640000	10.00000	3.233333	4.250000	3.712500
PD-C	5.310000	10.00000	3.181818		
PD-E	2.650000	9.00000	3.375000	5.500000	4.769864
PD-F	1.990000	8.00000	3.787037	5.625000	5.387500
PD-R	7.300000	11.00000	2.641026	6.321429	5.958304
PM-M			2.993056	6.153846	6.430769
PM-P	5.300000	10.00000	3.000000	6.363636	6.025370
RE-A					
RE-E	3.980000	10.00000	3.666667		
RE-M			2.733333	4.000000	3.571429
RM-B	1.990000	8.00000	4.222222	6.736842	5.939963
RM-F			2.925926	5.548387	5.161290
SO	3.980000	10.00000		5.865169	5.470042
All Grps	4.540387	9.85806	3.081995	6.268421	6.008532

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	RESP	ASSUR	EMPTHY	TANG	CSSERVQ
CASU-DL	7.551546	7.547819	7.135898	7.005989	7.235125
CASU-DS	5.294400	5.942308	5.838236	5.832601	5.624210
CO-CC	5.000000	6.250000	5.800000	5.000000	5.610000
CO-CQ	7.000000	7.333333	7.333333	6.500000	7.020000
CO-F	5.397727	5.552131	5.640909	5.551237	5.558205
CO-M	6.000000	6.000000	5.600000	5.812883	5.894553
CO-R					
CO-TO					
CO-TS	5.250000	5.298611	5.566667	5.417795	5.362829
CT-C	5.766129	6.379032	6.303226	5.475806	5.928320
CT-P	5.918665	6.518863	6.216615	6.210296	6.216695
DS	6.025000	7.050000	6.456667	6.189253	6.345517
ED-CC	6.700000	7.166667	6.599403	6.381253	6.601464
ED-CE	6.036765	6.566176	6.500759	6.077867	6.195137
ED-DA	6.801471	7.014706	6.341176	6.271280	6.521951
ED-DC	5.916667	6.566667	5.430000	6.512240	5.967773
ED-DM	6.250000	7.000000	6.580000	5.829495	6.331899
ED-GE	4.900000	5.266667	5.133333	5.326242	5.271357
ED-GF	6.250000	7.000000	5.800000	5.000000	6.170000
ED-GG					
ED-HE	6.175926	6.207692	6.022222	4.952093	5.942698
ED-HG	7.283333	7.066667	7.026667	6.518021	6.877604
ED-HP	5.865385	7.076923	5.907692	6.807692	6.439231
ED-HQ	6.045455	6.409091	6.545455	6.125371	6.090529
EE	4.785714	4.946429	5.153061	6.436062	5.304801
HR-M	6.964286	7.035714	7.485714	6.512613	6.919665
HR-P	7.013158	6.605263	6.410526	5.942691	6.531170
HR-R	6.350000	6.500000	6.328000	6.499020	6.334436
HR-T	8.500000	9.000000	8.600000	7.000000	8.300000
IM-I	4.854167	5.473718	5.633333	5.578371	5.201232
IM-P	8.250000	8.250000	8.200000	8.250000	8.150000
IR	6.937500	7.031250	6.675000	6.484375	6.818125
LM-S	7.068548	6.580346	6.441935	6.165062	6.566422
LM-T	6.858122	6.502273	6.366667	5.938923	6.416935
OC	6.750000	7.026316	7.442105	7.849867	7.106289
PA	3.785714	5.857143	5.226866	5.728828	4.911106
PD-A	3.828125	4.890625	4.200000	4.984375	4.323125
PD-C					
PD-E	6.100184	5.916667	5.417566	5.291667	5.499189
PD-F	5.968750	5.531250	6.262500	5.906250	5.811250
PD-R	6.562500	5.997253	6.321429	5.960013	6.159900
PM-M	6.711538	6.903846	6.853846	6.548077	6.689615
PM-P	5.272727	6.670510	6.120000	6.119816	6.041685
RE-A					
RE-E					
RE-M	4.071429	4.962637	4.485714	4.673642	4.352970
RM-B	6.092105	6.375000	6.663158	6.316859	6.277417
RM-F	5.153226	5.498230	5.353725	5.455970	5.324488
SO	5.954645	6.326663	5.813483	5.683047	5.849576
All Grps	6.228657	6.480055	6.252168	6.091330	6.212149

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	CSSERVWT	CSTSDIF	CSTSVAR	CSTASKUN	HIG_LOW2
CASU-DL	7.240472	2.017241	2.286842	4.304083	35.83333
CASU-DS	5.475333	1.990385	2.519231	4.509615	29.44028
CO-CC	5.692500	4.000000	3.000000	7.000000	34.75556
CO-CQ	7.071667	3.666667	3.666667	7.333333	29.23167
CO-F	5.573407	2.743243	2.397727	5.140971	37.75833
CO-M	6.012509	3.250000	2.625000	5.875000	33.07778
CO-R					32.58333
CO-TO					34.84537
CO-TS	5.320391	2.722222	2.972222	5.694444	29.75139
CT-C	5.935140	2.540323	1.983871	4.524194	25.91111
CT-P	6.204761	2.203846	2.169231	4.373077	30.57901
DS	6.369124	2.966667	2.808333	5.775000	35.52222
ED-CC	6.634071	2.218750	2.458333	4.677083	35.01481
ED-CE	5.986872	2.641667	2.500000	5.141667	35.12778
ED-DA	6.520323	2.805556	3.092593	5.898148	35.04646
ED-DC	5.604484	2.825000	2.725000	5.550000	33.66111
ED-DM	6.615975	2.500000	1.750000	4.250000	32.67222
ED-GE	5.422841	2.200000	3.000000	5.200000	34.96889
ED-GF	6.590000	2.750000	3.000000	5.750000	39.70056
ED-GG					34.07569
ED-HE	6.152318	2.879630	2.898148	5.777778	34.67593
ED-HG	6.683014	2.416667	3.233333	5.650000	32.28000
ED-HP	6.417308	3.000000	2.615385	5.615385	33.98333
ED-HQ	6.262537	2.590909	2.545455	5.136364	33.07593
EE	5.186145	3.035714	2.982143	6.017857	32.16111
HR-M	6.804414	3.250000	2.821429	6.071429	33.81944
HR-P	6.652776	2.236842	2.144737	4.381579	34.49583
HR-R	6.184700	2.390000	2.050000	4.440000	33.56833
HR-T	8.465000	1.500000	2.000000	3.500000	35.13333
IM-I	5.043901	2.937500	2.104167	5.041667	33.85046
IM-P	8.127500	2.250000	3.000000	5.250000	37.50370
IR	6.869375	2.078125	2.859375	4.937500	34.37222
LM-S	6.562385	2.476415	2.382075	4.858491	28.23519
LM-T	6.413208	2.254237	2.012712	4.266949	32.05185
OC	6.972230	2.960526	3.657895	6.618421	38.21154
PA	4.907057	2.857143	2.357143	5.214286	34.86667
PD-A	4.130063	2.703125	2.406250	5.109375	34.86417
PD-C					34.30952
PD-E	5.369766	2.291667	2.562500	4.854167	34.20417
PD-F	5.546094	3.062500	2.671875	5.734375	34.73485
PD-R	6.139144	1.571429	1.741071	3.312500	36.05940
PM-M	6.549135	3.153846	2.740385	5.894231	33.45171
PM-P	6.019130	3.454545	2.977273	6.431818	33.68333
RE-A					
RE-E					31.01667
RE-M	3.940475	2.321429	2.607143	4.928571	30.33889
RM-B	6.274193	2.169355	1.951613	4.120968	33.65556
RM-F	5.266261	2.241935	2.112903	4.354839	29.09444
SO	5.806969	2.847561	2.685976	5.533537	
All Grps	6.180301	2.543184	2.497463	5.040647	34.15312

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	TASKUN	H_L2	QUAD	DEVDEGFM	GRPDEVDF
CASU-DL	0.00000	1.00000	4.00000	-.28750	1.00000
CASU-DS	0.00000	0.00000	1.00000	.37325	3.00000
CO-CC	0.00000	1.00000	4.00000	-.41477	1.00000
CO-CQ	1.00000	0.00000	2.00000	.57649	3.00000
CO-F	1.00000	1.00000	3.00000	.13205	2.00000
CO-M	0.00000	1.00000	4.00000	-.44033	1.00000
CO-R	0.00000	0.00000	1.00000	.41260	3.00000
CO-TO	1.00000	1.00000	3.00000	-.08616	2.00000
CO-TS	0.00000	0.00000	1.00000	.11702	2.00000
CT-C	0.00000	0.00000	1.00000	.74120	3.00000
CT-P	0.00000	0.00000	1.00000	1.06958	3.00000
DS	0.00000	1.00000	4.00000	.42834	3.00000
ED-CC	0.00000	1.00000	4.00000	.00635	2.00000
ED-CE	0.00000	1.00000	4.00000	-.12983	2.00000
ED-DA	0.00000	1.00000	4.00000	-.15659	2.00000
ED-DC	0.00000	1.00000	4.00000	-.33868	1.00000
ED-DM	1.00000	1.00000	3.00000	-.36703	1.00000
ED-GE	1.00000	1.00000	3.00000	.20232	3.00000
ED-GF	1.00000	1.00000	3.00000	-.01511	2.00000
ED-GG	1.00000	1.00000	3.00000	.13976	2.00000
ED-HE	1.00000	1.00000	3.00000	-.15190	2.00000
ED-HG	1.00000	0.00000	2.00000	.13608	2.00000
ED-HP	0.00000	1.00000	4.00000	.06268	2.00000
ED-HQ	0.00000	1.00000	4.00000	-.17931	2.00000
EE	0.00000	0.00000	1.00000	.59738	3.00000
HR-M	1.00000	1.00000	3.00000	.35875	3.00000
HR-P	1.00000	1.00000	3.00000	.13784	2.00000
HR-R	1.00000	1.00000	3.00000	.61402	3.00000
HR-T	0.00000	1.00000	4.00000	.13946	2.00000
IM-I	0.00000	1.00000	4.00000	.18951	2.00000
IM-P	1.00000	1.00000	3.00000	-.04722	2.00000
IR	0.00000	1.00000	4.00000	.51785	3.00000
LM-S	0.00000	0.00000	1.00000	.65674	3.00000
LM-T	0.00000	0.00000	1.00000	.30972	3.00000
OC	1.00000	1.00000	3.00000	-.01427	2.00000
PA	1.00000	1.00000	3.00000	.26508	3.00000
PD-A	1.00000	1.00000	3.00000	-.05689	2.00000
PD-C	0.00000	1.00000	4.00000	.54712	3.00000
PD-E	0.00000	1.00000	4.00000	-.01668	2.00000
PD-F	1.00000	1.00000	3.00000	-.04959	2.00000
PD-R	0.00000	1.00000	4.00000	-.21800	1.00000
PM-M	0.00000	1.00000	4.00000	.02122	2.00000
PM-P	0.00000	1.00000	4.00000	.08189	2.00000
RE-A					1.00000
RE-E	1.00000	0.00000	2.00000	.80489	3.00000
RE-M	0.00000	0.00000	1.00000	.35087	3.00000
RM-B	1.00000	1.00000	3.00000	.13946	2.00000
RM-F	0.00000	0.00000	1.00000	-.44285	1.00000
SO	1.00000	0.00000	2.00000	.09439	2.00000
All Grps	1.00000	1.00000		.11253	2.00000

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	DEVINFL	GRPDVINF	DEVJBCD	GRPDVJCD	SUBQUAD
CASU-DL	-.35265	1.00000	-.35657	1.00000	12.00000
CASU-DS	-.08413	2.00000	-.03331	2.00000	1.00000
CO-CC	.10347	2.00000	-.55039	1.00000	10.00000
CO-CQ	-1.20764	1.00000	.64981	3.00000	6.00000
CO-F	.07889	2.00000	-.33542	1.00000	7.00000
CO-M	-.65193	1.00000	-.51039	1.00000	11.00000
CO-R	.22511	3.00000	.05107	2.00000	1.00000
CO-TO	.26189	3.00000	.06978	2.00000	7.00000
CO-TS	-.87349	1.00000	.22358	3.00000	1.00000
CT-C	-1.25338	1.00000	.57888	3.00000	2.00000
CT-P	-.29221	1.00000	.23313	3.00000	2.00000
DS	.31253	3.00000	.58230	3.00000	11.00000
ED-CC	.01658	2.00000	-.15779	2.00000	12.00000
ED-CE	-.35414	1.00000	-.25624	1.00000	11.00000
ED-DA	-.27822	1.00000	-.10136	2.00000	12.00000
ED-DC	-.30155	1.00000	-.62781	1.00000	10.00000
ED-DM	-.19564	1.00000	-.48647	1.00000	9.00000
ED-GE	-.12823	2.00000	.20588	3.00000	7.00000
ED-GF	-.01001	2.00000	.03186	2.00000	9.00000
ED-GG	-.23822	1.00000	.17864	2.00000	7.00000
ED-HE	-.68528	1.00000	-.19477	2.00000	8.00000
ED-HG	.13370	2.00000	-.21677	1.00000	6.00000
ED-HP	.02957	2.00000	-.27136	1.00000	12.00000
ED-HQ	-.17154	2.00000	-.38853	1.00000	11.00000
EE	.50697	3.00000	.95384	3.00000	1.00000
HR-M	.48288	3.00000	.12084	2.00000	9.00000
HR-P	.15179	2.00000	.29011	3.00000	9.00000
HR-R	.23117	3.00000	.19147	2.00000	8.00000
HR-T	.82069	3.00000	-.11770	2.00000	12.00000
IM-I	.15574	2.00000	.01945	2.00000	10.00000
IM-P	.36413	3.00000	-.57640	1.00000	9.00000
IR	.46366	3.00000	.52815	3.00000	12.00000
LM-S	-.60550	1.00000	.52815	3.00000	3.00000
LM-T	.16166	2.00000	.31010	3.00000	3.00000
OC	-.10728	2.00000	-.16578	2.00000	9.00000
PA	.13770	2.00000	.22183	3.00000	7.00000
PD-A	.03333	2.00000	.26074	3.00000	7.00000
PD-C	.09347	2.00000	.53392	3.00000	10.00000
PD-E	.31049	3.00000	-.14660	2.00000	10.00000
PD-F	.25631	3.00000	-.31250	1.00000	7.00000
PD-R	-.37978	1.00000	-.61025	1.00000	11.00000
PM-M	-.04960	2.00000	-.22850	1.00000	12.00000
PM-P	.00105	2.00000	-.11039	2.00000	11.00000
RE-A		1.00000		1.00000	
RE-E	.03396	2.00000	.19060	2.00000	4.00000
RE-M	-.37489	1.00000	.40523	3.00000	1.00000
RM-B	.76434	3.00000	-.11770	2.00000	8.00000
RM-F	.02167	2.00000	-.70795	1.00000	1.00000
SO		1.00000	.23645	3.00000	4.00000
All Grps	-.07781	2.00000	-.01584	2.00000	

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	QUAD3	DEVHI_LO	GRPDEVHL	DEVUNSTD	GRPDEVUN
CASU-DL	4.00000	3.70799	3.00000	-.50587	1.00000
CASU-DS	1.00000	-3.01212	1.00000	.68287	3.00000
CO-CC	4.00000	1.35001	2.00000	-.72414	1.00000
CO-CQ	2.00000	-4.53832	1.00000	-.60669	1.00000
CO-F	1.00000	1.98861	2.00000	.34281	3.00000
CO-M	4.00000	.06470	2.00000	-.45748	1.00000
CO-R	1.00000	-.14940	2.00000	.69735	3.00000
CO-TO	1.00000	.05682	2.00000	-1.08423	1.00000
CO-TS	1.00000	-3.43690	1.00000	-.32946	1.00000
CT-C	1.00000	-5.23305	1.00000	.47864	3.00000
CT-P	1.00000	-2.77047	1.00000	.98973	3.00000
DS	4.00000	2.22881	3.00000	.36840	3.00000
ED-CC	4.00000	1.58123	2.00000	-.56822	1.00000
ED-CE	4.00000	1.97453	2.00000	-.34344	1.00000
ED-DA	4.00000	2.01003	3.00000	-.18847	2.00000
ED-DC	4.00000	.42777	2.00000	-.30353	1.00000
ED-DM	1.00000	-2.02288	1.00000	-.96055	1.00000
ED-GE	1.00000	.04017	2.00000	-.18599	2.00000
ED-GF	1.00000	5.00546	3.00000	-.29950	2.00000
ED-GG	1.00000	.04640	2.00000	-.23533	2.00000
ED-HE	1.00000	.54150	2.00000	-.27751	2.00000
ED-HG	2.00000	-1.95254	2.00000	.01327	2.00000
ED-HP	4.00000	.61984	2.00000	.46467	3.00000
ED-HQ	4.00000	-.14740	2.00000	-.00107	2.00000
EE	1.00000	-.66507	2.00000	.24004	2.00000
HR-M	1.00000	-.31498	2.00000	.71358	3.00000
HR-P	1.00000	.92208	2.00000	.23616	2.00000
HR-R	1.00000	-.62216	2.00000	.19893	2.00000
HR-T	4.00000	2.40060	3.00000	-.43160	1.00000
IM-I	4.00000	.48697	2.00000	.03112	2.00000
IM-P	1.00000	3.74306	3.00000	.11182	2.00000
IR	4.00000	2.48050	3.00000	.98770	3.00000
LM-S	1.00000	-4.59100	1.00000	.25437	2.00000
LM-T	1.00000	-.68089	2.00000	.23858	2.00000
OC	1.00000	3.65661	3.00000	.06307	2.00000
PA	1.00000	-.94978	2.00000	.00085	2.00000
PD-A	1.00000	1.03811	2.00000	-.66182	1.00000
PD-C	4.00000	1.04160	2.00000	.46613	3.00000
PD-E	4.00000	.87571	2.00000	-.14048	2.00000
PD-F	1.00000	-.33403	2.00000	-.58087	1.00000
PD-R	4.00000	3.20652	3.00000	-.32596	1.00000
PM-M	4.00000	.49120	2.00000	.21630	2.00000
PM-P	4.00000	1.16085	2.00000	.00919	2.00000
RE-A			1.00000		1.00000
RE-E	2.00000	-5.36046	1.00000	1.12980	3.00000
RE-M	1.00000	-2.95452	1.00000	.27805	2.00000
RM-B	1.00000	-1.03954	2.00000	.76840	3.00000
RM-F	1.00000	-2.89073	1.00000	-.64388	1.00000
SO	2.00000		1.00000	-.05090	2.00000
All Grps		.50091	2.00000	-.08050	2.00000

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	DEVRLOB	GRPDEVRO	DEVAUEM	GRPDEVAE	DEVEMDS
CASU-DL	-.57077	1.00000	1.06762	3.00000	.62453
CASU-DS	.28768	3.00000	.17573	2.00000	-.29119
CO-CC	-.35527	1.00000	-.80027	1.00000	-.04021
CO-CQ	1.21556	3.00000	-.27980	2.00000	-.98023
CO-F	.02486	2.00000	.06484	2.00000	.46422
CO-M	-.80527	1.00000	-.25027	2.00000	1.35979
CO-R	.14825	2.00000	.20340	2.00000	-.59598
CO-TO	.02967	2.00000	.43062	3.00000	.62832
CO-TS	-.08232	2.00000	.13044	2.00000	-.50603
CT-C	.90038	3.00000	-.23816	2.00000	-1.02671
CT-P	1.66428	3.00000	-.60376	1.00000	-.00790
DS	.17710	2.00000	.02307	2.00000	-.23640
ED-CC	.21796	3.00000	-.56043	1.00000	.40017
ED-CE	-.36937	1.00000	-.64827	1.00000	-.69216
ED-DA	-.27429	1.00000	.27052	2.00000	.01780
ED-DC	-.56283	1.00000	.16450	2.00000	.49714
ED-DM	-.29405	1.00000	-.65727	1.00000	.62317
ED-GE	.07027	2.00000	-.43193	1.00000	-.23965
ED-GF	-.26841	1.00000	.98527	3.00000	.79395
ED-GG	.04329	2.00000	-.86110	1.00000	-.37824
ED-HE	-.33252	1.00000	.77762	3.00000	.35207
ED-HG	-.17530	2.00000	.91203	3.00000	-.05430
ED-HP	-.33171	1.00000	-.02777	2.00000	-.03449
ED-HQ	-.61008	1.00000	.06100	2.00000	.02399
EE	.27218	3.00000	-.56193	1.00000	-.02644
HR-M	-.02642	2.00000	.69440	3.00000	.09436
HR-P	-.37819	1.00000	.00923	2.00000	-.11526
HR-R	1.03992	3.00000	.53600	3.00000	-.07601
HR-T	.42710	3.00000	.48140	3.00000	-.11140
IM-I	.11994	2.00000	.27151	2.00000	.15335
IM-P	-.15249	2.00000	.70684	3.00000	.64306
IR	-.25880	1.00000	.37940	3.00000	-.43445
LM-S	.90787	3.00000	-.17616	2.00000	.23222
LM-T	.01257	2.00000	.16484	2.00000	.37453
OC	-.33549	1.00000	-.04955	2.00000	-.48368
PA	.07775	2.00000	.21340	2.00000	.76927
PD-A	-.33684	1.00000	-.34917	1.00000	.23937
PD-C	.30137	3.00000	-.05318	2.00000	-.79635
PD-E	-.23276	1.00000	-.44918	1.00000	-.32822
PD-F	.14024	2.00000	-.40282	1.00000	-.24655
PD-R	-.25468	1.00000	.47269	3.00000	.74192
PM-M	-.33152	1.00000	.23361	2.00000	.76578
PM-P	-.05527	2.00000	-.25027	2.00000	.29729
RE-A		1.00000		1.00000	
RE-E	.79890	3.00000	-.81460	1.00000	-1.46530
RE-M	.03415	2.00000	-.42793	1.00000	-.57293
RM-B	-.57290	1.00000	.23140	2.00000	-.86140
RM-F	-.54940	1.00000	-.41082	1.00000	1.01685
SO	-.38700	1.00000	-.41660	1.00000	-.53835
All Grps	-.00260	2.00000	.06156	2.00000	.02419

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	GRPDEVED	DEVSUDS	GRPDEVSD	DEVRLIN	GRPDEVRN
CASU-DL	3.00000	-.13120	2.00000	-1.04249	1.00000
CASU-DS	2.00000	-.31871	1.00000	.37591	3.00000
CO-CC	2.00000	-.45799	1.00000	.99585	3.00000
CO-CQ	1.00000	-.76693	1.00000	.98826	3.00000
CO-F	3.00000	-.09255	2.00000	.91609	3.00000
CO-M	3.00000	.09201	2.00000	1.36252	3.00000
CO-R	1.00000	.54738	3.00000	-.35251	1.00000
CO-TO	3.00000	-.33958	1.00000	-.09111	2.00000
CO-TS	1.00000	.02614	2.00000	-.39632	1.00000
CT-C	1.00000	.97598	3.00000	-.83266	1.00000
CT-P	2.00000	-.09353	2.00000	.97636	3.00000
DS	2.00000	1.19020	3.00000	-.72900	1.00000
ED-CC	3.00000	-.44817	1.00000	-.61330	1.00000
ED-CE	1.00000	.27056	2.00000	1.72264	3.00000
ED-DA	2.00000	.18427	2.00000	.53365	3.00000
ED-DC	3.00000	-.49091	1.00000	-.36718	1.00000
ED-DM	3.00000	-.91697	1.00000	.22784	2.00000
ED-GE	2.00000	-.26222	2.00000	.26008	2.00000
ED-GF	3.00000	.61161	3.00000	.55046	3.00000
ED-GG	1.00000	.52054	3.00000	-.14976	2.00000
ED-HE	3.00000	-.02407	2.00000	.39650	3.00000
ED-HG	2.00000	-.24106	2.00000	.83923	3.00000
ED-HP	2.00000	-.32321	1.00000	-1.02476	1.00000
ED-HQ	2.00000	-.52051	1.00000	-.93436	1.00000
EE	2.00000	.16641	2.00000	.02646	2.00000
HR-M	2.00000	.98484	3.00000	-.18064	2.00000
HR-P	2.00000	.00716	2.00000	-.23979	2.00000
HR-R	2.00000	.72949	3.00000	.19898	2.00000
HR-T	2.00000	-.43480	1.00000	.27100	2.00000
IM-I	2.00000	.34199	3.00000	-.49512	1.00000
IM-P	3.00000	-.39613	1.00000	-.27389	2.00000
IR	1.00000	1.13665	3.00000	-.58912	1.00000
LM-S	2.00000	.21998	2.00000	-1.25578	1.00000
LM-T	3.00000	-.50620	1.00000	.01307	2.00000
OC	1.00000	.74248	3.00000	.68182	3.00000
PA	3.00000	-.30987	1.00000	-1.05193	1.00000
PD-A	2.00000	.13931	2.00000	-.42684	1.00000
PD-C	1.00000	.46537	3.00000	.58140	3.00000
PD-E	1.00000	.03172	2.00000	-.22361	2.00000
PD-F	2.00000	-.18562	2.00000	.04158	2.00000
PD-R	3.00000	-.91437	1.00000	1.26186	3.00000
PM-M	3.00000	-.31313	1.00000	.11112	2.00000
PM-P	2.00000	-.22049	2.00000	-.30415	1.00000
RE-A	1.00000		1.00000		1.00000
RE-E	1.00000	.67230	3.00000	-.67543	1.00000
RE-M	1.00000	.27593	2.00000	-.49239	1.00000
RM-B	1.00000	.31520	3.00000	-.72900	1.00000
RM-F	3.00000	-1.64905	1.00000	-.49586	1.00000
SO	1.00000	-.25625	2.00000	.46445	3.00000
All Grps	2.00000	-.02574	2.00000	.17449	2.00000

VALUES OF CALCULATED VARIABLES FOR WORK UNITS (CONTINUED)

UNIT	DEVUNHM	GRPDEVUH	DEVINFL	GRPDEVIF
CASU-DL	1.01042	3.00000	-.25041	1.00000
CASU-DS	-1.58170	1.00000	.01811	2.00000
CO-CC	-.14798	2.00000	.12750	2.00000
CO-CQ	-.07682	2.00000	-1.18361	1.00000
CO-F	.21714	2.00000	.02412	2.00000
CO-M	-.68131	1.00000	-.60302	1.00000
CO-R	-.10612	2.00000	.28291	3.00000
CO-TO	-.91361	1.00000	.27821	3.00000
CO-TS	-.68196	1.00000	-.79903	1.00000
CT-C	-1.14953	1.00000	-1.14226	1.00000
CT-P	-.95077	1.00000	-.21308	1.00000
DS	-.05728	2.00000	.38810	3.00000
ED-CC	.61442	3.00000	.04328	2.00000
ED-CE	.35124	3.00000	-.27856	1.00000
ED-DA	.57411	3.00000	-.22487	1.00000
ED-DC	-.03292	2.00000	-.24756	1.00000
ED-DM	-1.00845	1.00000	-.15561	2.00000
ED-GE	.14142	2.00000	-.09709	2.00000
ED-GF	.67853	3.00000	.01579	2.00000
ED-GG	.67140	3.00000	-.18709	2.00000
ED-HE	.64866	3.00000	-.68080	1.00000
ED-HG	-.33186	1.00000	.16839	2.00000
ED-HP	.75473	3.00000	.12292	2.00000
ED-HQ	-.08046	2.00000	-.08708	2.00000
EE	-.97330	1.00000	.58255	3.00000
HR-M	-.96581	1.00000	.51402	3.00000
HR-P	.16326	2.00000	.22292	3.00000
HR-R	-.99713	1.00000	.24275	3.00000
HR-T	-.22395	2.00000	.93182	3.00000
IM-I	.27334	2.00000	.22390	3.00000
IM-P	.83367	3.00000	.44267	3.00000
IR	.07682	2.00000	.59256	3.00000
LM-S	-.03429	2.00000	-.53585	1.00000
LM-T	-.15625	2.00000	.22538	3.00000
OC	1.04596	3.00000	-.07995	2.00000
PA	.05667	2.00000	.17772	2.00000
PD-A	.79861	3.00000	.07246	2.00000
PD-C	1.08775	3.00000	.15531	2.00000
PD-E	1.54078	3.00000	.37718	3.00000
PD-F	-.29914	2.00000	.22820	3.00000
PD-R	1.25047	3.00000	-.30420	1.00000
PM-M	.37001	3.00000	.02153	2.00000
PM-P	.81869	3.00000	.08107	2.00000
RE-A		1.00000		1.00000
RE-E	-1.82550	1.00000	-.01489	2.00000
RE-M	-.20690	2.00000	-.31709	1.00000
RM-B	-.89062	1.00000	.75104	3.00000
RM-F	-.61155	1.00000	.12095	2.00000
SO	.80861	3.00000		1.00000
All Grps	.19724	2.00000	-.03050	2.00000

APPENDIX C.

LETTERS OF AUTHORIZATION

Donald R. Groh
3864 Provence # B
St. Louis, Missouri 63125

Dr. Zeithaml
1155 Belfair Way
Chapel Hill, NC 27514

Dr. Zeithaml:

Request permission to use your SERVQUAL instrument for measuring service quality. The results will be used as part of a doctoral dissertation that I am completing through the University of Missouri-Rolla.

I am studying organizational contingency theory with service quality as the dependent variable. I will be more than happy to share the results with you.

Thank you very much. I look forward to building upon the organizational theory body of knowledge with the help of your measurement tools.

My telephone number is (314) 331-8479.

Sincerely,

Donald R. Groh

Donald R. Groh

As long as you cite the instrument as developed by us, you have permission

Valarie Zeithaml

UNIVERSITY OF MINNESOTA

Carlson School of Management

Department of Strategic Management and Organization

835 Management & Econ. Bldg
271 19th Avenue South
Minneapolis, MN 55455

612-624-5232
Fax: 612-625-2873

February 13, 1996

Mr. Donald R. Groh
Department of the Army
St. Louis District
Corps of Engineers
1222 Spruce Street
St. Louis, MO 63103-2833

Dear Mr. Groh:

Forgive my delay in responding to your August 23 request to use the work unit module of our Organization Assessment Instruments as part of your doctoral dissertation. As we discussed on the telephone, I presume you are doing so. You have my official permission to use the OAI free of charge provided that you will share the results with me as you indicate. By obtaining the results from OAI users, like you, we will be able to eventually establish some good norms (means, standard deviations, correlations) for different kinds of jobs, work groups and organizations.

I trust your research is proceeding well. I will be happy to discuss any questions with you. I look forward to seeing the results of your study.

Sincerely,

Andy Van de Ven

Andrew H. Van de Ven
Vernon H. Heath Professor of
Organizational Innovation and Change

APPENDIX D.

UNIT EMPLOYEE QUESTIONNAIRE

S: 20 December 1995
06 December 1995

CELMS-DE

MEMORANDUM FOR Employees in District Offices

SUBJECT: Organizational Assessment Survey-**Employee Questionnaire**

1. The attached questionnaire is Part I of a two part District-wide organizational assessment survey. Part I is being administered to supervisors and their employees. Part II will be administered to internal customers of District offices. The purpose of this questionnaire is to learn more about the work, structure, and processes of your office. The information obtained from this survey will help managers throughout the District ensure that the structure and processes of their offices facilitate their employees in providing high service quality to internal customers. The benefits of providing high service quality to internal customers are effective District-wide production processes and high employee morale. This survey is associated with research being conducted by one of our employees, Mr. Don Groh, as part of a doctoral program. This survey is not associated with any other on-going effort in the District.

2. Your answers are strictly confidential. The answers that you give will be grouped with the answers of other people, and no individual person will ever be identified in any report.

3. It is important that you answer each question frankly and honestly. There are no hidden meanings behind any question. There are no right or wrong answers.

4. Please fill out the attached survey and return it, using the enclosed envelope, by the suspense date noted above.

5. If you have any questions, please contact Mr. Don Groh at (314) 331-8479. Thank you for your input.

Encl

THOMAS C. SUERMANN
COL, EN
Commanding

DEFINITIONS

This questionnaire asks questions about your immediate unit and your unit members.

WORK UNIT (UNIT) - Work Unit (Unit) is the office composed of your immediate supervisor and all individuals (your co-workers) who directly report to your immediate supervisor. **WORK UNIT (UNIT) IS THE OFFICE INDICATED BY THE OFFICE SYMBOL UNDER YOUR NAME BELOW.**

JOHN DOE
PD-E

UNIT SUPERVISOR - Unit supervisor is the person to whom you report to directly.

UNIT MEMBERS - Unit members are the individuals in your immediate work unit except your immediate supervisor.

INTERNAL CUSTOMER - An internal customer is an employee of the St. Louis District who has used the services of your work unit.

UNIT OPERATING RULES, POLICIES, AND PROCEDURES - Refer to the various operating rules, policies, and procedures that all personnel in your unit are expected to follow to coordinate and control all the work activities performed in your unit. These rules and procedures may be formal or informal, written or unwritten, however, they are different from those used to guide each individual in performing his or her own job, because they apply to all people in your unit, regardless of the particular job each performs.

GENERAL INSTRUCTIONS

Most of the questions ask you to circle one of several numbers that appear on a scale below the item. Corresponding with each number on a scale is a brief description of what the number represents. You are to circle the one number that most accurately reflects your answer to each question. For example, if your answer to the following question is "very much", circle the number "5" on the answer scale.

How much is it worth my time to fill out this questionnaire during the next hour?

NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
1	2	3	4	5

INTERNAL CUSTOMER IDENTIFICATION

1. Please write the **NAME** and **OFFICE SYMBOL** (e.g. John Smith, PD-E) of an individual who has been an **INTERNAL CUSTOMER** of your work unit within the last three months.

____

CONTEXT QUESTIONS

Task Difficulty Questions

2. *How easy* is it for *you* to *know* whether you do your work correctly?

VERY DIFFICULT	QUITE DIFFICULT	SOMEWHAT EASY	QUITE EASY	VERY EASY
1	2	3	4	5

3. *What percent of the time* are you *generally sure* of what the *outcomes* of your work efforts will be?

40% OR LESS	41-60%	61-75%	76-90%	91% OR MORE
1	2	3	4	5

4. In the past three months, *how often* did difficult problems arise in your work for which there were no immediate or apparent solutions?

ONCE A WEEK OR LESS	ABOUT 2-4 TIMES A WEEK	ABOUT ONCE A DAY	ABOUT 2-4 TIMES A DAY	5 TIMES OR MORE A DAY
1	2	3	4	5

5. About *how much time* did you spend solving these *difficult problems*?

LESS THAN 1 HOUR/WEEK	ABOUT 1-4 HOURS/WEEK	ABOUT 1 HOUR/DAY	ABOUT 2-3 HOURS/DAY	4 HOURS OR MORE PER DAY
1	2	3	4	5

Task Variability Questions

6. *To what extent* do you perform the *same tasks* from day to day?

ALMOST ALL MY TASKS ARE THE SAME DAY-TO-DAY	MANY OF MY TASKS ARE THE SAME DAY-TO-DAY	ABOUT HALF OF MY TASKS ARE THE SAME DAY-TO-DAY	SOME OF MY TASKS ARE THE SAME DAY-TO-DAY	ALMOST NO TASKS ARE THE SAME DAY-TO-DAY
1	2	3	4	5

7. *How much the same* are the day-to-day situations, problems, or issues you encounter in performing your major tasks?

VERY MUCH THE SAME	MOSTLY THE SAME	QUITE A BIT DIFFERENT	VERY MUCH DIFFERENT	COMPLETELY DIFFERENT
1	2	3	4	5

8. During a normal week, *how frequently* do *exceptions arise* in your work which require *substantially different* methods or procedures for doing it?

VERY RARELY	OCCASIONALLY	QUITE OFTEN	VERY OFTEN	CONSTANTLY
1	2	3	4	5

9. *How often* do you follow about the *same work methods or steps* for *doing* your major tasks from *day to day*?

VERY SELDOM	SOMETIMES	ABOUT HALF THE TIME	QUITE OFTEN	VERY OFTEN
1	2	3	4	5

STRUCTURAL DIMENSION QUESTIONS

Degree of Formalization

Unit Standardization Questions

10. *How clearly* have specific *performance targets been set* for your unit?

NO TARGETS WERE SET	TARGETS ARE VERY UNCLEAR	TARGETS ARE SOMEWHAT CLEAR	TARGETS ARE QUITE CLEAR	TARGETS ARE VERY CLEAR
1	2	3	4	5

11. *How specific or general* are the *unit operating rules, policies, and procedures* for coordinating and controlling the work activities of all unit members?

THERE ARE NO SET RULES, POLICIES, OR PROCEDURES	VERY GENERAL	SOMEWHAT SPECIFIC	QUITE SPECIFIC	VERY SPECIFIC
1	2	3	4	5

12. *How often* did unit members *violate or ignore* these unit operating rules, policies, or procedures during the past three months?

NOT ONCE	VERY SELDOM	ABOUT HALF THE TIME	QUITE OFTEN	ALL THE TIME
1	2	3	4	5

13. *How strictly* are unit operating rules, policies, or procedures *enforced*?

NOT AT ALL ENFORCED	VERY LOOSELY ENFORCED	SOMEWHAT STRICTLY ENFORCED	QUITE STRICTLY ENFORCED	VERY STRICTLY ENFORCED
1	2	3	4	5

Job Codification Questions

14. I feel that I am my own boss in most matters.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

15. Unit members can make their own decisions without checking with anybody else.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

16. How things are done in this unit is left up to the unit member doing the work.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

17. Unit members are allowed to do almost as they please.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

18. Most unit members make their own rules on the job.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

Rule Observation Questions

19. Unit members are constantly being checked on for rule violations.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

20. Unit members feel as though they are constantly being watched to see that they obey all the rules.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

Degree of Centralization

Participation in Decision Making Questions

21. How frequently do you usually participate in the decision to hire new staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

22. How frequently do you usually participate in decisions on the promotion of any of the staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

23. How frequently do you participate in decisions on the adoption of new policies?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

24. How frequently do you participate in the decisions on the adoption of new programs?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

Hierarchy of Authority Questions

Supervisory, Unit Employee, Unit Collegial, and External Authority

25. *How much say or influence* do *each* of the following have in *deciding what kinds of work or tasks* are to be performed in your unit:	AMOUNT OF SAY IN DECIDING UNIT'S WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5
c. Unit members *individually*?	1	2	3	4	5
d. The unit supervisor and members *as a group* in unit meetings?	1	2	3	4	5

26. *How much influence* or say did *each* of the following have in *deciding performance criteria* for your unit:

	AMOUNT OF SAY IN DECIDING CRITERIA				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5
c. Unit members *individually*?	1	2	3	4	5
d. Your supervisor and unit members *as a group* in unit meetings?	1	2	3	4	5

27. *How much influence or say* did each of the following have in *deciding* upon unit operating rules, policies, and procedures:

	AMOUNT OF INFLUENCE IN DECIDING UNIT OPERATING RULES, POLICIES, AND PROCEDURES				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. Your *unit supervisor*?	1	2	3	4	5
c. Unit members *individually*?	1	2	3	4	5
d. Your supervisor and unit members *as a group* in unit meetings?	1	2	3	4	5

Employee Discretion Questions

28. *How much say or influence do you have in making each of the following decisions about your work?*	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining *what* tasks I will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work I have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* my work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

Supervisory Discretion Questions

29. Listed below are the same work decisions. This time indicate how *much influence* your immediate supervisor has in making each decision about your work.	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining what tasks I will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work I have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* my work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

Degree of Complexity

Role Interchangeability in Unit Questions

30. During the past 3 months, *how many other unit members performed the same basic tasks* as you did?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

31. *How many other unit members are qualified* to do your tasks?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

32. *How easy* would it be to *rotate* the jobs *between unit members*, so that each could do a good job performing someone else's tasks?

VERY DIFFICULT, MOST MEMBERS WOULD NEED EXTENSIVE RETRAINING	QUITE DIFFICULT, SOME MEMBERS WOULD NEED EXTENSIVE RETRAINING	SOMEWHAT DIFFICULT, A FEW MEMBERS WOULD NEED RETRAINING	QUITE EASY, SOME MEMBERS WOULD NEED MINOR RETRAINING	VERY EASY, NO MEMBERS WOULD NEED RETRAINING
1	2	3	4	5

Unit Skill Heterogeneity Questions

33. *How many hours per week on or off the job* do you spend in some kind of *reading or training* to keep current in the skills needed to do your job (**not including formal training e.g. OPM courses**)?

LESS THAN 1 HR/WK	ABOUT 1-3 HR/WK	ABOUT 4-6 HR/WK	ABOUT 7-9 HR/WK	ABOUT 10 HR/WK OR MORE
1	2	3	4	5

34. When you *began* this job, *how long a period of orientation and training* did you receive that was *directly related to your job*?

A FEW HOURS OR LESS	ABOUT A DAY	ABOUT A WEEK	ABOUT A MONTH	MORE THAN A MONTH
1	2	3	4	5

35. How many *years* of academic, vocational, or professional *education* have you obtained *beyond high school*?

YEARS AFTER HIGH SCHOOL									
0	1	2	3	4	5	6	7	8	9

UNIT PROCESSES QUESTIONS

Unit Communications or Information Flows

36. During the past 3 months, *how often* did you receive or send *written reports, memos, or E-mails* related to your work from or to each of the following people:

	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS, MEMOS, OR E-MAILS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Your unit supervisor?	1	2	3	4	5
b. Other unit members or co-workers?	1	2	3	4	5
c. People outside of your unit?	1	2	3	4	5

37. During the past 3 months, *how often* did you have work-related *discussions (face-to-face or by telephone)* with each of the following people:

	HOW OFTEN HAD WORK-RELATED DISCUSSIONS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Your unit supervisor?	1	2	3	4	5
b. Other unit members or co-workers?	1	2	3	4	5
c. People outside of your unit?	1	2	3	4	5

38. During the past 3 months, *how often* were you involved in *special group problem-solving meetings* with:	HOW OFTEN WERE MEETINGS HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
a. Two or more people from your unit?	1	2	3	4	5	6
b. Two or more people from outside of your unit?	1	2	3	4	5	6
39. *How often* were regularly scheduled staff meetings held among people in your unit.	1	2	3	4	5	6

Perception of Overall Service Quality Question

40. How would the internal customer, that you identified in question number 1, answer the following statement? (Desired service level is defined as the level of performance your customer believes that a unit of your type *can* and *should deliver*. **"XYZ" in the following statement is your work unit.**)

	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
When it comes to **overall service quality** XYZ's performance is:	1	2	3	4	5	6	7	8	9	N

APPENDIX E.

UNIT SUPERVISOR QUESTIONNAIRE

S: 20 December 1995
06 December 1995

CELMS-DE

MEMORANDUM FOR Supervisors in District Offices

SUBJECT: Organizational Assessment Survey-**Supervisor Questionnaire**

1. The attached questionnaire is Part I of a two part District-wide organizational assessment survey. Part I is being administered to supervisors and their employees. Part II will be administered to internal customers of District offices. The purpose of this questionnaire is to learn more about the work, structure, and processes of your office. The information obtained from this survey will help managers throughout the District ensure that the structure and processes of their offices facilitate their employees in providing high service quality to internal customers. The benefits of providing high service quality to internal customers are effective District-wide production processes and high employee morale. This survey is associated with research being conducted by one of our employees, Mr. Don Groh, as part of a doctoral program. This survey is not associated with any other on-going effort in the District.

2. Your answers are strictly confidential. The answers that you give will be grouped with the answers of other people, and no individual person will ever be identified in any report.

3. It is important that you answer each question frankly and honestly. There are no hidden meanings behind any question. There are no right or wrong answers.

4. Please fill out the attached survey and return it, using the enclosed envelope, by the suspense date noted above.

5. If you have any questions, please contact Mr. Don Groh at (314) 331-8479. Thank you for your input.

Encl

THOMAS C. SUERMANN
COL, EN
Commanding

DEFINITIONS

This questionnaire asks questions about your immediate unit and your unit members.

YOUR IMMEDIATE UNIT - Your immediate unit is the office which includes you (as the supervisor) and all individuals who report *directly* to you. **YOUR IMMEDIATE UNIT IS THE OFFICE INDICATED BY THE OFFICE SYMBOL UNDER YOUR NAME BELOW.**

JOHN DOE
PD-E

UNIT MEMBERS - Unit members are the individuals in your immediate unit who report to you.

INTERNAL CUSTOMER - An internal customer is an employee of the St. Louis District who has used the services of your work unit.

UNIT OPERATING RULES, POLICIES, AND PROCEDURES - Refer to the various operating rules, policies, and procedures that all personnel in your unit are expected to follow to coordinate and control all the work activities performed in your unit. These rules and procedures may be formal or informal, written or unwritten, however, they are different from those used to guide each individual in performing his or her own job, because they apply to all people in your unit, regardless of the particular job each performs.

GENERAL INSTRUCTIONS

Most of the questions ask you to circle one of several numbers that appear on a scale below the item. Corresponding with each number on a scale is a brief description of what the number represents. You are to circle the one number that most accurately reflects your answer to each question. For example, if your answer to the following question is "very much", circle the number "5" on the answer scale.

How much is it worth my time to fill out this questionnaire during the next hour?

NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
1	2	3	4	5

INTERNAL CUSTOMER IDENTIFICATION

1. Please write the **NAME** and **OFFICE SYMBOL** (e.g. John Smith, PD-E) of an individual who has been an **INTERNAL CUSTOMER** of your work unit within the last three months.

____

CONTEXT QUESTIONS

Task Difficulty Questions

2. *How easy* is it for *you* to *know* whether you do your work correctly?

VERY DIFFICULT	QUITE DIFFICULT	SOMEWHAT EASY	QUITE EASY	VERY EASY
1	2	3	4	5

3. *What percent of the time* are you *generally sure* of what the *outcomes* of your work efforts will be?

40% OR LESS	41-60%	61-75%	76-90%	91% OR MORE
1	2	3	4	5

4. In the past three months, *how often* did difficult problems arise in your work for which there were no immediate or apparent solutions?

ONCE A WEEK OR LESS	ABOUT 2-4 TIMES A WEEK	ABOUT ONCE A DAY	ABOUT 2-4 TIMES A DAY	5 TIMES OR MORE A DAY
1	2	3	4	5

5. About *how much time* did you spend solving these *difficult problems*?

LESS THAN 1 HOUR/WEEK	ABOUT 1-4 HOURS/WEEK	ABOUT 1 HOUR/DAY	ABOUT 2-3 HOURS/DAY	4 HOURS OR MORE PER DAY
1	2	3	4	5

Task Variability Questions

6. *To what extent* do you perform the *same tasks* from day to day?

ALMOST ALL MY TASKS ARE THE SAME DAY-TO-DAY	MANY OF MY TASKS ARE THE SAME DAY-TO-DAY	ABOUT HALF OF MY TASKS ARE THE SAME DAY-TO-DAY	SOME OF MY TASKS ARE THE SAME DAY-TO-DAY	ALMOST NO TASKS ARE THE SAME DAY-TO-DAY
1	2	3	4	5

7. *How much the same* are the day-to-day situations, problems, or issues you encounter in performing your major tasks?

VERY MUCH THE SAME	MOSTLY THE SAME	QUITE A BIT DIFFERENT	VERY MUCH DIFFERENT	COMPLETELY DIFFERENT
1	2	3	4	5

8. During a normal week, *how frequently* do *exceptions arise* in your work which require *substantially different* methods or procedures for doing it?

VERY RARELY	OCCASIONALLY	QUITE OFTEN	VERY OFTEN	CONSTANTLY
1	2	3	4	5

9. *How often* do you follow about the *same work methods or steps* for *doing* your major tasks from *day to day*?

VERY SELDOM	SOMETIMES	ABOUT HALF THE TIME	QUITE OFTEN	VERY OFTEN
1	2	3	4	5

STRUCTURAL DIMENSION QUESTIONS

Degree of Formalization

Unit Standardization Questions

10. *How clearly* have specific *performance targets* been set for your unit?

NO TARGETS WERE SET	TARGETS ARE VERY UNCLEAR	TARGETS ARE SOMEWHAT CLEAR	TARGETS ARE QUITE CLEAR	TARGETS ARE VERY CLEAR
1	2	3	4	5

11. *How precisely* do *unit operating rules, policies, and procedures specify* how work activities are to be coordinated and controlled?

VERY GENERAL	MOSTLY GENERAL	SOMEWHAT SPECIFIC	QUITE SPECIFIC	VERY SPECIFIC
1	2	3	4	5

12. *How often* did unit members *violate or ignore* unit operating rules, policies, and procedures during the past three months?

NOT ONCE	VERY SELDOM	ABOUT HALF THE TIME	QUITE OFTEN	ALL THE TIME
1	2	3	4	5

13. *How strictly* are unit operating rules, policies, and procedures *enforced*?

NOT AT ALL ENFORCED	VERY LOOSELY ENFORCED	SOMEWHAT STRICTLY ENFORCED	QUITE STRICTLY ENFORCED	VERY STRICTLY ENFORCED
1	2	3	4	5

14. *To what degree* are *numerical or quantified procedures used* to *measure* performance criteria of your unit?

NO MEASURE-MENT IS MADE	ONLY SUBJECTIVE NONQUANTIFIED IMPRESSIONS ARE RECORDED	LOOSE BUT QUANTIFIED MEASURES ARE RECORDED	QUITE SPECIFIC QUANTIFIED MEASURES ARE RECORDED	VERY SPECIFIC AND PRECISE QUANTIFIED MEASURES AND PROCEDURES ARE RECORDED
1	2	3	4	5

15. What *percent* of unit operating rules, policies, and procedures as a whole *are written out* in memos, reports, or a procedures manual?

0-20%	21-40%	41-60%	61-80%	81-100%
1	2	3	4	5

Job Codification Questions

16. I feel that I am my own boss in most matters.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

17. Unit members can make their own decisions without checking with anybody else.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

18. How things are done in this unit is left up to the unit member who is doing the work.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

19. Unit members are allowed to do almost as they please.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

20. Most unit members make their own rules on the job.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

Rule Observation Questions

21. Unit members are constantly being checked on for rule violations.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

22. Unit members feel as though they are constantly being watched to see that they obey all the rules.

DEFINITELY TRUE	SOMEWHAT TRUE	SOMEWHAT FALSE	DEFINITELY FALSE
1	2	3	4

Degree of Centralization

Participation in Decision Making Questions

23. How frequently do you usually participate in the decision to hire new staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

24. How frequently do you usually participate in decisions on the promotion of any of the staff?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

25. How frequently do you participate in decisions on the adoption of new policies?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

26. How frequently do you participate in the decisions on the adoption of new programs?

NEVER	SELDOM	SOMETIMES	OFTEN	ALWAYS
1	2	3	4	5

Hierarchy of Authority Questions

Supervisory, Unit Employee, Unit Collegial, and External Authority

27. *How much say or influence* do each of the following have in *deciding what kinds of work or tasks* are to be performed in your unit:

	AMOUNT OF SAY IN DECIDING UNIT'S WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You, as the *unit supervisor*?	1	2	3	4	5
c. Your immediate subordinates, *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

28. *How much influence* or say did *each* of the following have in *deciding performance criteria* for your unit:

	AMOUNT OF SAY IN DECIDING CRITERIA				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You, as the unit supervisor?	1	2	3	4	5
c. Your immediate subordinates, *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

A variety of appraisal methods can be relied upon to determine and evaluate how well an organization is achieving its performance criteria.

29. *To what degree* are *each* of the following methods of appraisal *relied upon* to evaluate how well your unit performs its work:	DEGREE RELIED ON FOR EVALUATING WORK				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Appraisals made by line managers or staff specialists *outside* of your immediate work unit?	1	2	3	4	5
b. Appraisals made by *you individually*, as the unit supervisor?	1	2	3	4	5
c. Appraisals made by your *immediate subordinates* who *individually* review and evaluate their own performance?	1	2	3	4	5
d. Appraisals made by you and your immediate subordinates *as a group*, who meet to review and evaluate the work of one or more unit members?	1	2	3	4	5

30. *How much influence* or say did *each of* the following have in *deciding* upon unit operating rules, policies, and procedures:	AMOUNT OF SAY IN DECIDING UNIT OPERATING RULES, POLICIES, AND PROCEDURES				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. People in line management or staff positions *outside* of your immediate work unit?	1	2	3	4	5
b. You *as the unit supervisor*?	1	2	3	4	5
c. Your immediate subordinates *individually*?	1	2	3	4	5
d. You and your immediate subordinates *as a group* in unit meetings?	1	2	3	4	5

Employee Discretion Questions

31. *How much say or influence do your subordinates have in* making *each* of the following decisions about their work?	AMOUNT OF INFLUENCE YOUR SUBORDINATES HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining *what* tasks they will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work they have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* their work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

Supervisory Discretion Questions

32. Listed below are the same work decisions. This time indicate how *much influence* you as the unit supervisor have in making each decision about your subordinates' work.	AMOUNT OF INFLUENCE I HAVE IN EACH DECISION				
	NONE	LITTLE	SOME	QUITE A BIT	VERY MUCH
a. Determining what tasks your subordinates will perform from day to day?	1	2	3	4	5
b. *Setting quotas* on how much work your subordinates will have to complete?	1	2	3	4	5
c. *Establishing rules and procedures* about *how* your subordinates work is to be done?	1	2	3	4	5
d. Determining *how work exceptions* are to be handled?	1	2	3	4	5

Degree of Complexity

Role Interchangeability in Unit Questions

33. During the past 3 months, *how many* of your immediate unit *subordinates performed the same basic tasks*, or did each perform a different task?

NO ONE PERFORMED SAME TASKS	ONLY A FEW PERFORMED SAME TASKS	ABOUT HALF PERFORMED SAME TASKS	MANY PERFORMED SAME TASKS	ALL PERFORMED THE SAME BASIC TASKS
1	2	3	4	5

34. *How many of your immediate subordinates are qualified* to do one another's jobs?

NONE	ONLY ONE	A FEW OTHERS	MOST OTHERS	ALL OTHERS
1	2	3	4	5

35. *How easy* would it be to rotate the jobs of your *immediate subordinates*, so that each could do a good job performing the other's tasks?

VERY DIFFICULT, MOST MEMBERS WOULD NEED EXTENSIVE RETRAINING	QUITE DIFFICULT, SOME MEMBERS WOULD NEED EXTENSIVE RETRAINING	SOMEWHAT DIFFICULT, A FEW MEMBERS WOULD NEED RETRAINING	QUITE EASY, SOME MEMBERS WOULD NEED MINOR RETRAINING	VERY EASY, NO MEMBERS WOULD NEED RETRAINING
1	2	3	4	5

Unit Skill Heterogeneity Questions

36. *How many hours per week on or off the job* do you spend in some kind of *reading or training* to keep current in the skills needed to do your job (**not including formal training e.g. OPM courses**)?

LESS THAN 1 HR/WK	ABOUT 1-3 HR/WK	ABOUT 4-6 HR/WK	ABOUT 7-9 HR/WK	ABOUT 10 HR/WK OR MORE
1	2	3	4	5

37. When you *began* this job, *how long a period of orientation and training* did you receive that was *directly related to your job*?

A FEW HOURS OR LESS	ABOUT A DAY	ABOUT A WEEK	ABOUT A MONTH	MORE THAN A MONTH
1	2	3	4	5

38. How many *years* of academic, vocational, or professional *education* have you obtained *beyond high school*.

YEARS AFTER HIGH SCHOOL									
0	1	2	3	4	5	6	7	8	9

UNIT PROCESSES QUESTIONS

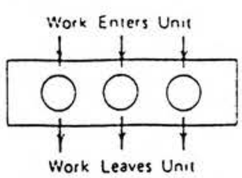
Work Flow Interdependence Within Unit Questions

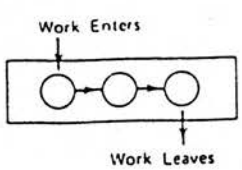
The next four questions are about the internal flow of work between your immediate subordinates. Listed and diagrammed below are four common ways that the work performed in your unit can flow between your immediate subordinates. (You, as the unit supervisor, should consider yourself outside the boxes below.)

39. Please indicate, *how much* of the *normal work* in your unit *flows between your immediate subordinates* in a manner as described by *each* of the following cases:

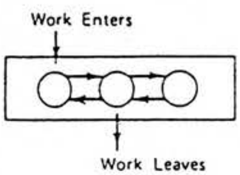
HOW MUCH WORK NORMALLY FLOWS BETWEEN MY IMMEDIATE SUBORDINATES IN THE MANNER INDICATED

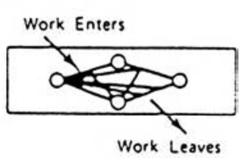
	ALMOST NONE OF THE WORK	LITTLE	ABOUT 50% OF ALL THE WORK	A LOT	ALMOST ALL OF THE WORK
a. *Independent Work Flow Case*, where work and activities are performed by your immediate subordinates separately and do not flow between them?	1	2	3	4	5
b. *Sequential Work Flow Case*, where work and activities flow between your immediate subordinates, but mostly in only one direction?	1	2	3	4	5





40. Please indicate, *how much* of the *normal work* in your unit *flows between your immediate subordinates* in a manner as described by *each* of the following cases:	HOW MUCH WORK NORMALLY FLOWS BETWEEN MY IMMEDIATE SUBORDINATES IN THE MANNER INDICATED				
	ALMOST NONE OF THE WORK	LITTLE	ABOUT 50% OF ALL THE WORK	A LOT	ALMOST ALL OF THE WORK
c. *Reciprocal Work Flow Case*, where work and activities flow between your immediate subordinates in a back-and-forth manner *over a period of time*?	1	2	3	4	5
d. *Team Work Flow Case*, where work and activities come into your unit and your immediate subordinates diagnose, problem solve, and collaborate as a group *at the same time* in meetings to deal with the work?	1	2	3	4	5





Unit Communications or Information Flows Questions

41. To coordinate the work of your unit during the past 3 months, *how often* were *written reports, memos, or E-mails* sent or received:	HOW OFTEN RECEIVED OR SENT WRITTEN REPORTS, MEMOS, OR E-MAILS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Between you and unit members?	1	2	3	4	5
b. Among unit members?	1	2	3	4	5
c. Between you and people outside of your unit?	1	2	3	4	5

42. During the past 3 months, *how often did* work-related *discussions (face-to-face or by telephone)* occur on a one-to-one basis:	HOW OFTEN HAD WORK-RELATED DISCUSSIONS IN PAST 3 MONTHS				
	NOT ONCE	ABOUT 1-3 TIMES A MONTH	ABOUT 1-3 TIMES A WEEK	ABOUT 1-3 TIMES A DAY	ABOUT EVERY HOUR
a. Between you and unit members?	1	2	3	4	5
b. Among unit members?	1	2	3	4	5
c. Between you and people outside your unit?	1	2	3	4	5

	HOW OFTEN MEETINGS WERE HELD IN PAST 3 MONTHS					
	NOT ONCE	ABOUT ONCE A MONTH	ABOUT EVERY 2 WEEKS	ABOUT ONCE A WEEK	ABOUT 2-4 TIMES A WEEK	ONCE A DAY OR MORE
43. *How frequently* did you conduct *regularly scheduled staff or unit meetings* with your immediate subordinates during the past 3 months?	1	2	3	4	5	6
44. During the past three months, *how frequently* were you involved in *impromptu, unscheduled meetings to solve specific work problems*:						
a. With two or more of your subordinates?	1	2	3	4	5	6
b. With two or more people from outside of your unit?	1	2	3	4	5	6

Perception of Overall Service Quality Question

45. How would the internal customer, that you identified in question number 1, answer the following statement? (Desired service level is defined as the level of performance your customer believes that a unit of your type *can* and *should deliver*. **"XYZ" in the following statement is your work unit.**)

	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
When it comes to **overall service quality** XYZ's performance is:	1	2	3	4	5	6	7	8	9	N

APPENDIX F.

CUSTOMER QUESTIONNAIRE

S:

CELMS-DE

MEMORANDUM FOR Internal Customers of District Offices

SUBJECT: Organizational Assessment Survey-**Customer Questionnaire for (OFFICE NAME AND SYMBOL)**

1. The attached questionnaire is Part II of a two part District-wide organizational assessment survey. Part I was administered to supervisors and their employees of District offices. Part II is being administered to internal customers of those offices. You have been identified as having been an internal customer of the subject office within the last three months. The purpose of this survey is to obtain your perceptions of the quality of services that the subject office provided to you. It also obtains your perceptions of the type of work that the subject office performs. The information obtained from this survey will help managers throughout the District ensure that the structure and processes of their offices facilitate their employees in providing high service quality to internal customers. The benefits of providing high service quality to internal customers are effective District-wide production processes and high employee morale. This survey is associated with research being conducted by one of our employees, Mr. Don Groh, as part of a doctoral program. This survey is not associated with any other on-going effort in the District.

2. Your answers are strictly confidential. The answers that you give will be grouped with the answers of other people, and no individual person will ever be identified in any report.

3. It is important that you answer each question frankly and honestly. There are no hidden meanings behind any question. There are no right or wrong answers.

4. Please fill out the attached survey and return it, using the enclosed envelope, by the suspense date noted above.

5. If you have any questions, please contact Mr. Don Groh at (314) 331-8479. Thank you for your input.

Encl

THOMAS C. SUERMANN
COL, EN
Commanding

GENERAL INSTRUCTIONS

Please think about the quality of service that (OFFICE NAME), hereafter referred to as (OFFICE SYMBOL), offers compared to your *desired service level* - the level of performance you believe that a unit of this type *can* and *should deliver* (i.e., the level of service you desire).

For each of the following statements, circle the number that indicates how (OFFICE SYMBOL)'s service compares with your desired service level.

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin-ion**
1. providing services as promised	1	2	3	4	5	6	7	8	9	N
2. dependability in handling customers' service problems	1	2	3	4	5	6	7	8	9	N
3. performing services right the first time	1	2	3	4	5	6	7	8	9	N
4. providing services at the promised time	1	2	3	4	5	6	7	8	9	N
5. maintaining error-free records	1	2	3	4	5	6	7	8	9	N
6. keeping customers informed about when services will be performed	1	2	3	4	5	6	7	8	9	N
7. prompt service to customers	1	2	3	4	5	6	7	8	9	N
8. willingness to help customers	1	2	3	4	5	6	7	8	9	N
9. readiness to respond to customer's requests	1	2	3	4	5	6	7	8	9	N
10. employees who instill confidence in customers	1	2	3	4	5	6	7	8	9	N

(OFFICE SYMBOL)'s Performance is:										
When it comes to:	***Lower* Than My Desired Service Level**			***The Same As* My Desired Service Level**			***Higher* Than My Desired Service Level**			**No Opin -ion**
11. making customers feel safe in their transactions	1	2	3	4	5	6	7	8	9	N
12. employees who are consistently courteous	1	2	3	4	5	6	7	8	9	N
13. employees who have the knowledge to answer customer questions	1	2	3	4	5	6	7	8	9	N
14. giving customers individual attention	1	2	3	4	5	6	7	8	9	N
15. employees who deal with customers in a caring fashion	1	2	3	4	5	6	7	8	9	N
16. having the customer's best interest at heart	1	2	3	4	5	6	7	8	9	N
17. employees who understand the needs of their customers	1	2	3	4	5	6	7	8	9	N
18. convenient business hours	1	2	3	4	5	6	7	8	9	N
19. modern equipment	1	2	3	4	5	6	7	8	9	N
20. visually appealing facilities	1	2	3	4	5	6	7	8	9	N
21. employees who have a neat, professional appearance	1	2	3	4	5	6	7	8	9	N
22. visually appealing materials associated with the service	1	2	3	4	5	6	7	8	9	N
23. overall service quality	1	2	3	4	5	6	7	8	9	N

IMPORTANCE OF SERVICE FEATURES

Listed below are five features pertaining to services offered by work units of this type. We would like to know how important each of these features is to *you* when you evaluate the quality of service offered by this type of work unit. Please allocate a total of 100 points among the five features *according to how important each feature is to you* - the more important a feature is to you, the more points you should allocate to it. Please ensure that the points you allocate to the five features add up to 100.

1. The appearance of (OFFICE SYMBOL)'s physical facilities, equipment, personnel, and communication materials.	________	points
2. (OFFICE SYMBOL)'s ability to perform the promised service dependably and accurately.	________	points
3. (OFFICE SYMBOL)'s willingness to help customers and provide prompt service.	________	points
4. The knowledge and courtesy of (OFFICE SYMBOL)'s employees and their ability to convey trust and confidence.	________	points
5. The caring, individualized attention (OFFICE SYMBOL) provides its customers.	________	points
TOTAL points allocated	100	points

NATURE OF WORK OF (OFFICE SYMBOL).

This portion of the survey obtains your perception of the nature of the work tasks which are performed by (OFFICE SYMBOL).

Task Difficulty Questions

1. *How easy* is it for members of (OFFICE SYMBOL) to *know* whether they do their work correctly?

VERY DIFFICULT	QUITE DIFFICULT	SOMEWHAT EASY	QUITE EASY	VERY EASY
1	2	3	4	5

2. *What percent of the time* would you say that members of (OFFICE SYMBOL) are *generally sure* of what the *outcomes* of their work efforts will be?

40% OR LESS	41-60%	61-75%	76-90%	91% OR MORE
1	2	3	4	5

3. In the past three months, *how often* do you think that difficult problems arise in the work of members of (OFFICE SYMBOL) for which there were no immediate or apparent solutions?

ONCE A WEEK OR LESS	ABOUT 2-4 TIMES A WEEK	ABOUT ONCE A DAY	ABOUT 2-4 TIMES A DAY	5 TIMES OR MORE A DAY
1	2	3	4	5

4. About *how much time* do you think that members of (OFFICE SYMBOL) spend solving these *difficult problems*?

LESS THAN 1 HOUR/WEEK	ABOUT 1-4 HOURS/WEEK	ABOUT 1 HOUR/DAY	ABOUT 2-3 HOURS/DAY	4 HOURS OR MORE PER DAY
1	2	3	4	5

Task Variability Questions

5. *To what extent* do you think that members of (OFFICE SYMBOL) perform the *same tasks* from day to day?

ALMOST ALL OF THEIR TASKS ARE THE SAME DAY-TO-DAY	MANY OF THEIR TASKS ARE THE SAME DAY-TO-DAY	ABOUT HALF OF THEIR TASKS ARE THE SAME DAY-TO-DAY	SOME OF THEIR TASKS ARE THE SAME DAY-TO-DAY	ALMOST NONE OF THEIR TASKS ARE THE SAME DAY-TO-DAY
1	2	3	4	5

6. *How much the same* are the day-to-day situations, problems, or issues that members of (OFFICE SYMBOL) encounter in performing their major tasks?

VERY MUCH THE SAME	MOSTLY THE SAME	QUITE A BIT DIFFERENT	VERY MUCH DIFFERENT	COMPLETELY DIFFERENT
1	2	3	4	5

7. During a normal week, *how frequently* do *exceptions arise* in the work of the members of (OFFICE SYMBOL) which require *substantially different* methods or procedures for doing it?

VERY RARELY	OCCASIONALLY	QUITE OFTEN	VERY OFTEN	CONSTANTLY
1	2	3	4	5

8. *How often* do members of (OFFICE SYMBOL) follow about the *same work methods or steps* for *doing* their major tasks from *day to day*?

VERY SELDOM	SOMETIMES	ABOUT HALF THE TIME	QUITE OFTEN	VERY OFTEN
1	2	3	4	5

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