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**THE IMPACT OF SUBCULTURES ON DECISION SUPPORT SYSTEM USAGE**

*The University of Nebraska - Lincoln*

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THE IMPACT OF SUBCULTURES ON  
DECISION SUPPORT SYSTEM USAGE

by

James R. Buffington

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Usage

**BY**

James R. Buffington

**APPROVED**

**DATE**

<u>Kenneth E. Kendall</u>	<u>4/21/86</u>
<u>Charles Lamphear</u>	<u>4/21/86</u>
<u>Sang M. Lee</u>	<u>4/21/86</u>
<u>John B. Cullen</u>	<u>4/21/86</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

**SUPERVISORY COMMITTEE**

**GRADUATE COLLEGE**

**UNIVERSITY OF NEBRASKA**

ABSTRACT

THE IMPACT OF SUBCULTURES ON  
DECISION SUPPORT SYSTEM USAGE

James Ray Buffington, Ph.D.

University of Nebraska, 1986

Adviser: Kenneth E. Kendall

The concept of organizational culture has excited interest recently, playing a key role in the understanding of behavior in organizations and as a determining agent in organization success. A related issue, as yet not well explored, is the extent to which subcultures affect the workings of organizations.

In addition, the introduction of decision support systems (DSS) into organizations has met with mixed success. Clearly, if culture is a key to understanding organizational behavior, then a study of the links between culture and the use of DSS is of great interest.

A number of user behavior characteristics are of interest. This study will consider user satisfaction with DSS and user involvement with DSS, both quantity and quality. In addition, the effectiveness of decision making from an organizational viewpoint is examined.

The primary thrusts of the study, then, are to explore:

1. Whether or not subcultures exist in the organization.
2. If so, what is the nature of the subcultures.
3. How are the subcultures associated with characteristics of decision support system usage.

In this study, 24 DSS users from three functional areas in a single organization are Q-sorted into three distinct subcultures. Individuals in the first of these subcultures are characterized by a strong, positive identification with the company image. Members of the second subculture are typified by a highly professional orientation. The third subculture is characterized by strong hostility directed toward the systems staff.

None of the three subcultures is strongly associated with demographic or situational variables. The demographic and situational variables include functional area, sex, length of DSS experience, and level of hierarchy.

Membership in the subcultures is more strongly associated with the thirteen items measuring user satisfaction with DSS. On the other hand, the demographic and situational variables are more strongly associated with quality of DSS usage. Both sets of independent



variables are associated equivalently with effectiveness of decision making from an organizational perspective.

## ACKNOWLEDGEMENTS

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## CHAPTER ONE

### INTRODUCTION

We are living in the information age, an age that is transforming the world as dramatically as did the Industrial Revolution. In the early years of the information age, the emphasis was on automating clerical work which has previously been done manually. Recently, however, attention has focused on decision support systems (DSS), a potentially revolutionary development in an already rapidly developing area.

DSS have brought the promise of not merely routinizing that which had always been done, but bringing the power of the computer to the aid of the manager, assisting the manager in making decisions in areas where the manager had little else other than intuition and tradition as partners.

However, with the promise has also come disappointment, for computer assisted decision making has not always lived up to its potential. In fact, a number of studies have shown considerable dissatisfaction on the part of users. (See, for example, Noland and Seward, 1974; Swanson, 1974; Debons, Ramage, and Orien, 1978; and Neuman and Segev, 1980.)



System analysts have frequently assumed that if users are dissatisfied with the system, then the fault must lie with what might be termed the technical efficiency of the system. For example, Bailey and Pearson (1983) surveyed users on 38 factors governing satisfaction. Most of these 38 factors are technical factors, e.g., accuracy, timeliness, reliability, precision, and currency.

It is not surprising that these factors have received so much attention. After all, system analysts are presumed to have technical competence--it is what they have been trained for. It is obvious that an effective DSS must be technically adequate. Technical competency is, then, a necessary condition for user satisfaction, but it is not a sufficient condition.

Decision support systems imply fundamental changes in the decision making process, and therefore require a significant change in the organization's way of doing things. Alter (1977), in a survey of 56 DSS, found that changing people was the key in the majority of cases. Most researchers have come to realize the importance of people in successfully implementing systems. Zmud (1979) reports that of all studies dealing with MIS success, the single most widely studied factor is individual differences of the user.

Lending support to the argument is Edelman (1981), who writes that it is not technological factors, but "human and cultural factors" which determine the direction of managing information. Robey and Markus (1984) argue that understanding dissatisfaction can be greatly enhanced by examining organizations in terms of political conflicts. They suggest an analysis of organizational ritual as an effective means of increasing understanding of the political interplay. Both these studies suggest a distinct anthropological bent.

Interest in organizational culture is apparent not only among those interested in understanding users and information systems. Organizational culture has stirred the imagination of researchers from a number of fields. *Corporate Cultures* (Deal and Kennedy, 1982) vividly portrays organizations which have been successful down through the years. The organizations are pictured informally, attention lavished on such details as the company logo and rituals.

Their thesis is that successful organizations use devices like logo and ritual to build enormous loyalty and commitment to the company. The "strong culture" company is then in a position to reap the benefits of a dedicated, imaginative, and diligent membership. The book details

how weak culture companies can become equally competitive. It is little wonder that the public has been excited with the promise of organization culture.

Although Deal and Kennedy reveal little empirical evidence of their thesis, the subject is deserving of study. If their contentions contain more than a grain of truth, then there are attractive implications for organizations and for our quality of life.

It can be argued, however, that most organizations are not filled with individuals who universally subscribe to the organizational culture. Instead, most organizations are more properly viewed as collections of often competing subcultures. If many organizations do indeed consist of competing subcultures, then it would behoove those interested in the design of effective decision making systems to increase their understanding of those subcultures.

Unfortunately, very little is known about the nature of subcultures. It is the twofold purpose of this study (a) to discover salient characteristics of organizational subcultures, and (b) to analyze the relationship between those subcultures and user behavior with regard to decision support systems.

### Study Summary

First, the research history of organizational culture is traced. Particular emphasis is given to how culture can help explain individual behavior. Various approaches to the study of culture are summarized, and important cultural elements are described. The role of subcultures is explored in more detail.

Several dimensions of DSS user behavior are then described, and previous attempts to explain this behavior are reviewed. How different subcultures can be expected to interreact with DSS user behavior is then presented.

Then, the methodology of the study is outlined. It is argued that the nature of subcultures is best discovered through a combination of interview, observation, and Q-sort techniques, followed by factor analysis. The potential of correlating subcultures with DSS user behavior is detailed.

Chapter Four analyzes the distinct nature of each of the three subcultures suggested by the study results. One subculture is shown to be aligned very closely with official corporate culture. Another subculture is more closely identified with what might be called a professional orientation. Individuals in the third subculture are typified by dissatisfaction with a number

of aspects of their relationship with computers and the computer staff.

The relationship of the subcultures with various demographic and situational variables is then examined. It is shown that individuals in each of the subcultures are not very strongly associated with any of the functional areas, with sex, with level of hierarchy, or with length of experience in the company.

Chapter Five explores the relationship of both the subcultures and the demographic variables with various measures of decision support system usage. Key features of DSS usage include satisfaction with DSS and staff specialists, quantity and quality of DSS usage, and DSS usage in terms of improved effectiveness of organizational decision making.

The results of the study clearly indicate that subcultures are key factors for explaining user satisfaction. In general, however, the demographic variables are more closely associated with quality of usage.

Finally, the implications of the study are described. The most important of these implications is that an understanding of company subcultures will allow DSS developers to market DSS more effectively.

## CHAPTER TWO

### LITERATURE REVIEW

In this chapter, the literature of organizational culture is reviewed. Particular emphasis is placed on studies of organizational subcultures. The chapter also reviews studies which explore variation in decision support system usage.

#### Culture and Organizations

The concept of organizational culture has greatly excited organizational researchers. A recent article (Broms and Gahmberg, 1983) reports on a computer search of two large data bases; and although an important cultural element was uncovered in only fifty business articles through 1979, by late 1981, the number had swollen to over five hundred. This exponential growth indicates a great deal of interest on the part of serious researchers.

There are a number of different approaches to the concept of organizational culture. Although one researcher (Smircich, 1983) has classified five separate approaches, only two broad approaches need be considered for the purposes of this study: (a) the anthropological approach and (b) the culture-as-variable approach.

### The Anthropological Approach

As the name suggests, the anthropological approach traces its roots to anthropology. Although it would be a gross oversimplification to claim that cultural anthropology is approached in only one way, many anthropologists would agree with Geertz (1973) that culture is a "system of shared beliefs and meanings"; symbolic action that needs to be interpreted in order to be understood.

Advocates of the first approach view culture as a root metaphor for organizations, superseding rather than complementing more traditional root metaphors: the organization as a machine, an organism, or the open systems approach. Organizations are understood in more subjective, symbolic terms, rather than the more traditional economic, material, and rational terms. Research questions are likely geared to such fundamental issues as how an organization is accomplished and what it means to be organized.

The culture-as-variable approach, as the name implies, regards culture as a key variable. Culture is something an organization has rather than something an organization is. Culture viewed in this fashion is thus related to the notion of organization climate, dating back

to the 1960's (Meyer, 1967). The concept of climate evolved because of dissatisfaction with the explanatory power of more traditional organization variables. Climate has ordinarily been conceptualized as a description of prevailing organizational practices and procedures (see, e.g., Schneider, 1974).

#### The Culture-as-Variable Approach

The culture-as-variable approach assumes contingent relationships among relatively stable elements. Organizational culture is also generally assumed to be subject to managerial control. Realization that symbolic processes are occurring in organizations has led researchers to include culture as a key variable in general organization models, with the expectation that cultural elements can better explain behavior from and within the organization (see, e.g., Pfeffer, 1981; Meyer 1982).

Critics of this approach have not been lacking. Riley (1983), for example, argues that because of complex interactions among organization members, often resulting in unintended consequences, an organization is "imbued with a life of its own"; therefore, culture should not be analyzed as something an organization has but as part of



what the organization is.

However, there are three strong arguments for regarding this approach as a valid and valuable approach to understanding organizations. First, as Jelinek, Smircich, and Hirsch (1983) argue, the concept of organizational culture is not well developed; therefore "a range of approaches seems not only desirable but required."

Second, the approach has yet to be thoroughly tested. If this approach can be shown to be useful in predictive ability, generating useful information for managers, then the distinction between culture as an "is" or a "has" becomes, for all practical purposes, meaningless.

Third, the two approaches share more similarities than they exhibit differences. It is true that the points of view are different, as are the methodologies typically employed. However the core concerns of the two approaches are virtually identical, as will become clear below.

Some of the bias existing toward the culture-as-variable approach can be attributed to justified reaction against early, ethnocentric anthropologists. These anthropologists compared foreign cultures to their own culture, to the disadvantage of the foreign culture. Obviously, preconceived notions of the inferiority of

other cultures can produce biased results. Anthropologists have labored to remove this ethnocentric bias in recent decades, and are understandably uneasy when researchers attempt to make comparative value judgments.

However, the same restriction is not quite so constraining with respect to organization studies. Cultural objectives are much more diverse than organizational objectives. Whether the primary objective of organizations is regarded as stakeholder satisfaction or long term organizational survival, relatively more objective judgments of the success of organizational cultures can be made. Provided that the success criteria are specifically defined, then, the culture-as-variable approach seems to be eminently useful.

That the culture-as-variable and anthropological approaches are really quite similar can be most easily understood by examining the subject matter of both types of approaches. Broken down to the most general levels, both approaches deal with myth, symbols, language, beliefs.

The primary difference between the two approaches, for practical purposes, can be summarized as differences in methodology. The anthropological approach can be summarized as employing qualitative research--case studies,

long term immersion into a particular culture, dynamic relationships, relatively subjective data gathering, and limited quantitative analysis. The culture-as-variable approach is characterized by more quantitatively oriented research.

As a general rule, qualitative research is ideal for exploratory purposes, when the emphasis is on discovering new relationships and new points of view. Quantitative research is appropriate for verifying those relationships and points of view. It can be argued the cultural approach to the study of organizations is not so novel that the more quantitative culture-as-variable approach might prove very useful.

The culture-as-variable approach includes two identifiable streams. One stream is concerned with national cultures. Typical examples of this stream of research are Ajiferuke and Boddewyn (1970), who assert that national cultural differences are the major cause of managerial similarities and differences, and Hofstede (1984), who investigates the relationship between national cultures and concepts of quality of worklife.

This stream of research doubtless has value. However, it is also fair to say that many good management practices are universal, as is convincingly argued by Deal

and Kennedy (1982) and Schonberger (1982). The fact that hundreds of Japanese subsidiaries operate in the U.S., with a large percentage of American workers, as successfully as in Japan is eloquent proof that management practices can be transferred across national boundaries.

It is the second stream of research that is of interest here. This stream envisions organizations as imbued with a particular, and modifiable, culture. For example, Pfeffer (1981) argues that managers act effectively through symbolic means, whereas Tichy (1982) argues that it is culture which makes organizational structuring possible.

#### Culture and Individual Behavior

There is growing evidence in recent years that organizational culture is a determinant of individual behavior in organizations. Both Louis (1980) and Meyer (1982) maintain that culture acts as a sense-making device, guiding and shaping behavior. Whorton and Worthley (1981) indicate that inadequate managerial understanding of organizational culture is a major obstacle to improvement.

However, the reverse viewpoint, that changing an organization's technology, its way of doing things, will change cultural manifestation, has merit. Schonberger

(1982), for example, convincingly argues that changes in operations techniques, notably a movement toward small lot sizes, can have a dramatic effect on employees' conceptions of product quality, a cultural adjunct. Olsen (1982) argues reasonably that changes in office technology will forever alter workers' core attitudes about organizational life.

Definitive answers to the question will likely not be forthcoming until a number of longitudinal studies have addressed the issue. Until that time, it seems reasonable to assert that culture is both cause and effect, both acting and acted upon. Changes in culture go hand in glove with changes in individual behavior--it is not possible, or at least not advisable, to initiate changes in the one without considering the other.

#### Cultural Elements

A key question to consider in any discussion of organization subcultures is how best to study the concept. To many researchers, the idea of shared values, meanings, and beliefs is central to the idea of culture. Thus, Trice and Beyer (1984) focus on ideology; Riley (1984), on vision; Whorton and Worthley (1981), on values; and Pettigrew (1979), on beliefs and ideologies.

However, as Broms and Gahmberg (1983) point out, it is not enough to focus on ideology since espoused beliefs are often times different from actual beliefs. This caveat is all the more warranted when considering subcultures, when individuals are expected to sometimes hold views different from the "official" organization culture.

This study of subcultures is therefore supplemented with methods of conveying ideologies. It is burdening culture too heavily to say, as does Gregory (1983), that organizational culture is evident in everything that happens within the organization. The statement is doubtless true, but is obviously more economical to consider dimensions of culture--processes which carry the essential values of the organization. Before looking at ideology, three such processes are considered next: myth metaphor, and symbolism.

#### Myth

The most widely discussed, and most generally misunderstood, cultural element is myth. Myth is often equated with a false belief, beliefs adhered to in spite of evidence to the contrary. Myths, as defined by Pettigrew (1979), are narratives "of events often with a

sacred quality which explores in dramatic form issues of origin and transformation." Myths, then, offer an explanation for organizational practices, providing a system of uniting an otherwise fragmented organization.

A number of researchers adopt the view that myths, or legends, stories, anecdotes, sagas as some authors prefer to term them, arise from behavior. For example, Smith and Simmons (1983) describe a recently created social service agency which fell upon hard times. The principal actors in the drama neatly corresponded to figures from the Rumpelstiltskin story.

There are four major characters in the Rumpelstiltskin myth: (a) Rumpelstiltskin, the magical gnome who can spin gold from straw; (b) the poor peasant, who wishes to marry off his daughter; (c) the daughter, a talented spinner; and (d) the king, rich and powerful. The characters correspond to these elements of the agency: (a) Rumpelstiltskin is the new director, (b) the peasant as the administrators who created the agency, (c) the daughter as the agency's key staff group, and (d) the king as the environment--those who expect "gold" from the new organization. Incidents at the agency parallel events in the myth, as shown in Table 2-1.

Table 2-1

## Rumpelstiltskin Myth (Smith and Simmons, 1983)

The Myth	The Reality
1. father captures gnome	1. administrators hire leaders
2. gnome offers to help daughter spin gold from straw	2. leader hand-picks staff group; spews rhetoric about "dream" program
3. father brags about daughter spinning gold from straw	3. administrators brag about excellence of new program
4. King hears rumor; demands proof; locks daughter in roomful of straw	4. community and agencies demand details of program
5. daughter promises her first-born son to gnome	5. budget is cut, staff asked to sacrifice salary and time
6. gnome spins gold; King marries daughter; rewards father	6. administrators give needed budget dollars to program
7. child born; all want to renege on deal with gnome	7. time to deliver the program; staff in a panic; leader doubted
8. trio discovers gnome's name; Rumpelstiltskin disappears in puff of smoke	8. leader is scape-goated, fired
9. all live happily ever after	9. facility opens



The correspondence between myth and reality was first observed by a low level employee during the height of organizational difficulties. The myth quickly spread throughout the organization. It would be absurd to argue that the Rumpelstiltskin myth initiated troubles for the organization, yet it seems fair to suggest that the spontaneous generation of the myth sustained current negative behavior. The claim is substantiated by the fact that later events unfolded much according to the myth. Thus we see the possibility of myth in perpetuating and directing behavior.

Martin, Feldman, Hatch, and Sitkin (1983) detail seven kinds of stories common to many organizations. One popular story concerns a new, low level employee who doesn't recognize the president of the organization and insists that the high level executive comply with a company regulation. The story has two possible outcomes: the low level employee is either (a) rewarded or (b) fired. It seems clear that individual behavior would likely be much more assertive in the first kind of organization.

Broms and Gahmberg (1983) believe myths derive their power from the fact that they are not only thought, but also felt--involving the entire personality. Myths are

therefore super-rational. The authors discuss three case studies involving long range strategic planning, and view this planning as mythological--a view of what the organization should be. In none of the cases were the strategic plans successfully implemented.

The authors take the rather unusual position of maintaining that, even though the plans were technically failures, the planning process was successful in that it achieved three purposes: (a) focusing of mind, (b) goal seeking, and (c) generating enthusiasm. One does not have to agree with Broms and Gahmberg in order to accept their evidence that the planning process did direct individual behavior. Even if the behavior was not always what the planners intended, all three cases are clear examples of culture influencing individual actions.

#### Metaphor

All human language is a valuable source for understanding how organizations function. Human behavior is influenced by understanding, and understanding is based, at least in part, on language. Metaphor is one of the most powerful conveyors of essential meaning, and is therefore considered the second cultural element.

Metaphor can be defined as a way of seeing things as if they were something else. Through the use of metaphor, the individual asserts a similarity between two things: the one is seen as having qualities like the second. Metaphoric thinking maintains a "double vision" (Brown, 1976), that is, seeing an object from two points of view enriches it.

To see how metaphor functions, one need only consider the characterization of corporate "headhunters." Corporate headhunters seek to attract talent from other organizations, and are not interested in donning war paint or severing and shrinking enemy heads. Yet the metaphor is apt, for it conveys the essential savagery and tenacity involved in corporate headhunting.

If we accept that metaphor serves to increase understanding, or, at the least, modify understanding, then there is a straightforward implication with regard to human behavior. Simply stated, human behavior is based, at least partially, on understanding. Anything that serves to alter understanding, then, has the potential to alter behavior.

The role of language in shaping organizational action at more than the literal level is not a well researched subject. Meyer (1982) is one of a very few researchers

who has examined the effects of metaphor on organizations. In a case study of several community hospitals, Meyer reports that one hospital is commonly characterized as "lean and hungry," and, in fact, the metaphor is substantiated by an uncommonly low employee to patient ratio. Another hospital was described as a "mob," which later investigation also largely substantiated. In this example, it could be suggested that metaphor plays a role in sustaining the behavior. In effect, metaphor serves much as the self-fulfilling prophecy.

#### Symbolism

Symbolism is not so readily definable as myth or metaphor. In a general sense, just about anything can be regarded as a symbol. According to Dandridge, Mitroff, and Joyce (1980), symbols are what organizational members use to make comprehensible "the unconscious feelings, images, and values" inherent in the organization. Symbolism "expresses the underlying character, ideology, or value system of an organization."

Thus myths and metaphors are kinds of verbal symbols. For the purposes of this paper, symbolism will be more narrowly defined as either (a) activities, kinds of ceremonies or ritual events, for example, orientation

programs or annual company picnics; or (b) objects-- concrete visual signs which carry a message about the company's beliefs.

Both kinds of symbols direct individual action in collective endeavors toward common goals. There has been very little research on how, or even whether, symbols affect individual behavior in organizations. However, some anthropologists assume that symbols are instigators of action. Cohen (1974) defines symbols as things which "evoke emotions, and impel men to action." The assumption seems warranted. Flags have inspired heroic actions on the battlefield. On a more mundane level, organizational social hours have been known to relax tensions and to promote friendships and loyalty.

#### Ideologies

Ideologies or values are a fourth cultural element. Ideologies are intimately related to myth, metaphor, and symbolism. After all, myth, metaphor, and symbolism all function to promote ideologies and values--perceptions of the organization.

Ideologies can be expressed in straightforward fashion also. Wilson (1973) defines ideology as "a set of beliefs about the social world and how it operates,

containing statements about the rightness of certain social arrangements and what action would be taken in the light of those statements." Ideology functions to gain individual commitment to an organization in order to perform everyday tasks on the way to some "grand scheme of things" (Pettigrew, 1979). Ideologies "link the past and future, lend dignity to everyday activities, and elicit members' commitment by transforming formal organizations into beloved institutions" (Meyer, 1982).

There is empirical evidence to support the claim that ideologies have a causal influence on individual behavior. In fact, Hage and Dewar (1973) report that beliefs held by organizational elites are among the best predictors of future organizational actions. Ideologies, then, are of great interest because organizational ideology is more subject to managerial control than any of the other cultural elements.

To summarize, there seems to be reasonable evidence that myth, metaphor, symbolism, and ideology all play a role in individual behavior. The four elements function to convey organizational values, beliefs, and goals. All mobilize awareness and purpose, give meaning to what would otherwise be meaningless, and legitimate and inspire action.

It is expected that a group of people who share similar perceptions of company myths, metaphor, and symbols tend to perceive the world in similar ways. Such a group can further be expected to exhibit similar types of behavior with respect to information systems.

#### Organization Subcultures

Some authorities believe that organizational subcultures may be as important, or more important, in understanding how organizations actually function. Smircich (1983), for example, suggests that "much of the literature refers to an organization culture, appearing to lose sight of the great likelihood that there are multiple organization subcultures, or even countercultures, competing to define the nature of situations within organizational boundaries."

Few studies have directly examined organizational subcultures. Among those which have, there seems to be scant common ground on what constitutes the nature of a subculture. Wilkens and Ouchi (1983) found that interpretations of organization stories differed according to hierarchical level. It can be inferred that the nature of subcultures is related to the level of hierarchy.

Gregory (1983), in a study of Silicon Valley computer companies, argues that subcultures are task related, finding evidence of "software" and "hardware" subcultures. She underscores the elusive nature of subcultures, discovering that members of one subculture can slip relatively easily into the folds of another subculture.

Trice and Beyer (1984) support the idea that both level of hierarchy and functional differentiation lead to the formation of subcultures. They further argue that the manifestation of subcultures, primarily through the use of rites and ceremonies, results from attempts of competing subcultures to work out conflicts.

Others, perhaps reacting to the popular literature on strong versus weak corporate cultures, have suggested that organizations are better viewed as collections of individuals with varying commitments to organizational values and goals. These collections of individuals can be grouped into subcultures according to their degree of commitment to organizational culture (Pettigrew, 1979).

Riley (1984) takes the differentiation one step further by speculating on the possibility of countercultures arising within the organization. It is important to note that such subcultures cross hierarchical



and functional lines, and are not then dependent on physical proximity.

Mitroff and Kilmann (1976) suggest that groups form subcultures based on similar Jungian types. Broms and Gahmberg (1983) concur, with groups of individuals differentiated by dominance of one hemisphere of the brain. One such subculture would therefore be typified as mythic, associative-holistic, nonrational, and the other as rational, logico-linear.

While there is no widespread agreement as to the nature of organizational subcultures, it seems reasonable to conclude that the concept of organizational subculture has at least some validity. Even more reasonable is the conclusion that individuals are likely to vary in their degree of commitment to organizational culture, and can be expected to form into subcultures based on some shared sets of values.

The existence of several subcultures within a single organization has important implications for anyone interested in behavior within the organization. More specifically, as will become clear below, the existence of groups of shared cultures within an organization has implications for those interested in the design and implementation of decision support systems.

## Evaluation of Decision Support System User Behavior

Before examining specific links between organizational culture and DSS user behavior, several approaches to the evaluation of those systems are considered. Cost benefit analysis is the traditional method of evaluating computer based information systems. Information systems, in other words, should produce benefits that are greater than their costs.

Early computer applications, largely geared to processing transactional data, could be evaluated in a relatively straightforward manner--system costs can be compared to savings in clerical costs. As the computer revolution advanced, however, both benefits and costs have become increasingly more difficult to measure.

With advanced computer based information systems, costs are more likely to be hidden. Edelman (1981) reports that RCA, which has scrupulously investigated information costs for the past several years, has calculated conservatively that these costs represent at least 10 percent of gross revenues. The cost percentage excludes managers and professionals, and is ten times higher than the old rule of thumb usually subscribed to.

Dollar estimates are much more difficult to measure, when systems assist in developing a strategic plan, for example. This difficulty is doubtless exacerbated in the public sector. Who can put an accurate figure, aside from transportation costs, on the benefits derived from a computer assisted plan to redistrict school boundaries?

The primary concern here is decision support systems, but there is no widespread agreement about exactly what constitutes a DSS. Some maintain that DSS is merely a restating of the objectives of management information systems; others, that DSS is a subset of MIS; and yet others insist that DSS is an evolutionary development. For the purposes of this paper, DSS are characterized by the following:

1. Supports managers in planning, problem solving, and judgment for semistructured tasks,
2. Is a personal tool, under the individual manager's control, leaving part of the decision up to personal judgment,
3. Is process, not product, oriented.

Traditional cost-benefit analysis is not well-suited for systems meeting the above qualifications. For these reasons, Keen (1981) advocates the use of "value analysis" in place of cost-benefit analysis. Value analysis is a

two stage approach in which a DSS prototype is assessed in terms of benefits, not necessarily quantified, and constrained by a cost threshold. The second stage assesses the later proposed full system in a similar fashion. Keen's approach appeals to common sense, and relies upon trust in managers' judgments.

#### *Technical Performance Measures*

A second category of performance measures was developed in conjunction with the development of MIS. This second category might be termed "technical" performance measures, and includes such characteristics as timeliness, currency, reliability, and completeness of the information, and response time, error recovery capability, and accessibility of the system. Technical performance is largely the responsibility of the systems specialists. Minimum levels of acceptability on these criteria are prerequisites for satisfactory performance. Although arising with the development of MIS, these measures are clearly relevant to DSS.

#### *User Satisfaction*

A third category of performance measures concerns users' reactions to the systems. Interest in this topic

was no doubt spurred by the widespread dissatisfaction expressed toward MIS in the late 1960's and early 1970's (Ackoff, 1967; Dearden, 1972). User reaction to the system is an important subject. Researchers have found generally positive correlations between job satisfaction and job performance (Szilagyi and Wallace, 1980).

If the relationship is true for MIS, it is even more important with regard to DSS, because DSS, by definition, are personal in nature, designed to assist the decision maker. If the decision maker is dissatisfied with the system, it is likely the system will not be used, or, if used, disregarded. There is a great deal of evidence showing that user satisfaction is closely associated with system effectiveness. (See, for example, Cheney, 1977; Guthrie, 1974; Lucas, 1975a; Mumford, 1969; O'Brien, 1977; Pearson and Bailey, 1979; Seward, 1975.)

Some researchers regard user reaction as a unidimensional concept. For example, Edmundsen and Jeffery (1984) assess user behavior by having users rate their overall satisfaction with the system. It makes sense to regard user reaction as a multidimensional concept, however. Other researchers have expanded on the concept of user behavior. Maish (1979), for instance, also analyzes user attitudes toward the system, but decomposes

the concept into attitudes toward usefulness of the system with regard to job performance, toward the expertise and helpfulness of systems staff, and toward information quality. Guthrie (1974) has developed a fifteen item questionnaire designed to measure user's information satisfaction.

#### Quantity and Quality of Usage

User satisfaction is not the only relevant consideration in assessing user behavior. A user may report satisfaction with a system, while never actually using it. Consequently, it is reasonable to assess how often individual managers use DSS. Also important is categorizing usage into kinds of activities performed, e.g., decision analysis, report generation, program enhancement. In addition, how often the manager has access to the DSS is a consideration. Assessing usage in greater detail will allow more meaningful analysis, and serve to increase the reliability of the measures.

Evaluating the quality of usage is another important consideration. A manager may be satisfied with the system, may indeed use the system, yet the usage may be rather routine. It would be well to distinguish between mandated and user-initiated activity, to categorize kinds

of user-initiated activities, and to catalog user involvement with systems implementation.

#### Organizational Effectiveness

A final consideration in examining user reaction to DSS is an analysis of the effect of the decision from the viewpoint of the organization. It is possible that a user could be satisfied with the system, use it frequently, be innovative in applying it, yet make decisions which have disastrous results for the organization.

Assessing the degree of improved organizational decision making is notoriously difficult. However, if we view DSS as more of a process than a product, it becomes possible to evaluate effectiveness of decision making. Processes which can be evaluated include the degree to which managers understand the problems facing them, explicitness of objectives, considerations of constraints and alternatives, quantification of decision attributes, and length of time in reaching decisions.

#### Summary of DSS Usage

In summary, cost benefit analysis is probably not appropriate for making decisions with regard to the implementation of DSS, nor is it necessary in assessing

user behavior. Technical qualities of the DSS, on the other hand, can be a useful means of evaluating system performance. Because of the personal nature of DSS, user reaction to the system is the best method of evaluating the system. Analysis of user reaction properly involves an assessment of users' attitudes toward the system, degree and quality of usage, and impact on organizational effectiveness.

#### Culture and DSS

It is the central purpose of this study to analyze the impact of organizational subcultures on decision support systems. Ample theoretical foundations have been laid for believing that organizational culture does affect individual behavior. In addition, the theory has been somewhat substantiated by exploratory, qualitative studies. More specifically, it has been suggested that two cultural elements, myth and metaphor, function to sustain and reinforce behavior. Symbolism and ideology, on the other hand, not only play a role in sustaining behavior, but also serve to inspire or initiate behavior.

Much less explored is the concept that culture affects behavior specifically associated with decision support systems. There have been many studies which have



examined this kind of behavior from other points of view. Zmud (1979), for example, maintains that differences among individuals are largely responsible for behavior and attitude with respect to information systems.

Zmud's view contrasts markedly with the view taken in this paper, for Zmud regards individual differences as givens, largely beyond the control of the organization-- attributes which the individual brings with him upon joining the organization and not easily subject to modification.

Zmud sees individual differences as composed of three broad categories: (a) cognitive style, (b) personality, and (c) demographic and situational variables. Cognitive style is usually associated with two dimensions: how one "takes in data," intuition or sensation; and how conclusions about the data are reached, thinking--by impersonal analysis--or feeling--by subjective personal processes (Mitroff and Kilmann, 1976). "Thinking" subjects have been found to seek more information (Goodenough, 1976), to prefer detailed, aggregate, quantitative reports (Bariff and Lusk, 1977; Benbasat and Dexter, 1979; Doktor and Hamilton, 1973). Thinking styles have also been found to require more decision time (Benbasat and Dexter, 1979). "Sensation" subjects have been found to prefer more

quantitative information (Huysman, 1970) and to require more decision time (Vasarhelyi, 1977).

Mixed results have emerged when considering quantity of information requested or used. Mock (1973) and Vasarhelyi (1977) report that intuitives preferred less information than sensations, while Barkin and Dickson (1977) found the reverse. Barkin and Dickson (1977) found that intuitives preferred raw data, whereas sensations prefer aggregated data. Zmud (1979), however, cites evidence to the contrary. Zmud (1979) summarizes cognitive research by concluding that, while cognitive styles do influence behavior with respect to information systems, it is "becoming increasingly realized that cognitive behaviors are dependent on contextual, i.e., task and environmental, factors as well as individual differences."

The concept of cognitive style appeals to intuition-- we all know individuals who display behavior in accordance with intuitive, sensory, thinking, or feeling modes of thought. However, it also seems reasonable to believe that all individuals possess the traits in various combinations, and all are capable of shifting from mode to mode. It seems equally reasonable to suggest that

organizational culture plays a role in modifying and directing individual cognitive style.

Personality differences is a second individual characteristic which has been suggested as influencing DSS behavior. Personality variables include locus of control, dogmatism, ambiguity, tolerance, extroversion, need for achievement, risk taking propensity, and anxiety level (Zmud, 1979). For example, individuals possessing an internal locus of control (self motivating) have been observed to practice greater information search activity (Lefcourt, 1972), as have less dogmatic subjects (Lambert and Durand, 1977; Long and Ziller, 1965). Less dogmatic subjects have also been characterized as more deliberate (Long and Ziller, 1965) and as less confident decision makers (Taylor and Dunette, 1974).

Information systems are reportedly used less frequently by individuals with greater risk-taking propensities (Taylor and Dunette, 1974), but the same type of subject has been shown to make better decisions (Wynne and Dickson, 1975). Extroverted individuals are more likely to have positive attitudes toward information systems (Wynne, 1975). On the other hand, Bartol and Martin (1982) have suggested that personality factors are,

generally speaking, weak predictors of performance and job satisfaction.

It is reasonable to assume that personality factors do have some effect on determining individual behavior. Unexplored, however, is the degree to which organizational culture shapes personality. The intent of this study is to explore the degree to which organizational culture is associated with DSS user behavior.

Situational and demographic variables have also been examined to account for information systems behavior. Unlike personality characteristics, situational and demographic characteristics are beyond the organization's power to modify. Situational and demographic characteristics receiving the most attention from researchers include general intellectual ability, sex, age, experience, education, and organizational level. Higher general intelligence is positively associated with information processing speed (Taylor and Dunette, 1974) and with increased organizing abilities (Hunt and Lansman, 1975). These findings, however, border on the tautological. Similarly tautological is the finding of Taylor and Dunette (1974) and Chervany and Dickson (1974) that intelligence is associated with better decision making ability.

Older subjects reportedly engage in more information search and also require more time in reaching decisions (Taylor, 1975). Individuals who are males (Mann and Williams, 1960), older (Mumford and Banks, 1967), or less educated (Lucas, 1978b) have been found to exhibit relatively less positive attitudes toward information systems.

Information systems usage also seems to be influenced by situational and demographic characteristics. Both amount of education (Lucas, 1975b) and experience (Lucas, 1975b; Werner, 1974) are associated with decreased amounts of information systems usage. Increased task knowledge, conversely, is associated with greater usage (Werner, 1974). Both educational levels (Lucas, 1978a) and experience (Lucas, 1975b; Maish, 1979) are negatively associated with favorable attitudes toward information systems.

Demographic and situational characteristics cannot be controlled by organizations, at least in the short run. However, it is expected that these kinds of differences play a relatively minor role in important DSS behavior. Chervany and Dickson (1978) generalize that studies of "individual differences as predictors of human behavior/performance have been basically unsuccessful."

This generalization is in agreement with the thinking of Simon and Newell (1971).

In summary, it can be concluded that, although individual differences are associated with kinds of user behavior, that association is generally weak. Huber (1983) observes that few researchers report the proportion of variance in decision making behavior that is attributable to cognitive style; if reported, it typically account for approximately only 10 percent of the total variance. A major goal of the study then, is to determine if organizational subcultures play a role in directly influencing individual behavior, and to compare the significance of that role to that of demographic variables.

#### **Strong and Weak Subcultures**

Of the several kinds of subcultures hypothesized in the literature, two seem particularly promising in terms of utility for DSS designers. One, taken largely from Deal and Kennedy's work (1982), might be termed "strong-weak" subcultures. The other kind of subculture is based on task differentiation and can be termed "functional" subcultures.

If one accepts the idea of strong-weak subcultures, then three prominent kinds of subcultures can be suggested: (a) a strong subculture, in which individuals' perceptions of myth, metaphor, symbol, and ideology strongly echo the official company doctrine; (b) a counter subculture, composed of those individuals whose cultural perceptions run strongly opposed to those of the strong subculture; (c) a weak subculture, composed of individuals who fit neither of the first two groups.

Given strong-weak subcultures, it can be argued that almost certainly, individuals in a strong subculture would score high on satisfaction and quantity usage. Individuals in the counter subculture would score low on satisfaction, with "weak" members posting moderate scores. It could also be argued that "counters" might also score rather high on quantity of usage, but dislike the systems and thus express dissatisfaction.

One might also intuitively suspect that "strongs" would also score high on the last two categories--quality of usage and effectiveness of decision making. Similarly, "counters" would be expected to score lower on these two categories than "weaks." However, such conclusions are tentative.

### Functional Subcultures

If one argues that functional subcultures are more likely to emerge, then one can suggest three large groupings: (a) a production subculture, (b) a marketing subculture, (c) and a staff or technical subculture. Significant differences with regard to DSS user behavior can also be argued here. For example, one might expect quantity of usage to receive the highest scores from individuals in the production subculture; but one might expect more innovative usage from marketing or staff.

Of these two approaches, it is the first--organizational cultures arrayed along a strong-weak dimension--which has generated the most enthusiasm. The first approach is also the one which has been least explored, particularly with regard to subcultures. Therefore, exploring this approach is a major purpose of this study.

Edelman (1981) writes that historically, changes in the management of information processing have been "motivated in part by technology, but also, and more importantly, by human and cultural factors." That claim has not, to this point, been specifically investigated. The remainder of this study examines that claim in considerable detail.



### CHAPTER THREE

#### METHODOLOGY

In this chapter, other attempts at describing organizational subcultures are examined. Then, the Q-sort methodology is described, and it is argued that this methodology is most suitable for this type of study. Methods of examining DSS user characteristics are then described, followed by description of the initial procedure in this study--the interview. The pilot study, sample, and the study itself are then described.

#### Organizational Subcultures

The nature of organizational subcultures is relatively unresearched. Trice and Beyer (1984) perceive subcultures as arising from conflict, and are therefore adversarial in nature. They argue that subcultures can be approached through a study of organizational rites and ceremonies, and offer a typology of rites and ceremonies. The typology is a useful starting point for further research. However, their discussion of organizational subcultures is largely anecdotal and therefore offers little concrete evidence with regard to the nature of subcultures.

Wilkins and Ouchi (1983) discuss subcultures only tangentially, suggesting groups within organizations which are oriented toward clan, market, or bureaucracy. Once again, however, the only evidence offered is anecdotal.

Mitroff and Kilmann (1976), although not directly addressing subcultures, separated managers, representing a number of different organizations, into four groups on the basis of cognitive style. Each group was asked to describe the ideal organization. The descriptions were subjected to content analysis, and the four "stories" of the ideal organization were found to differ significantly. The value of the research lies in suggesting content analysis of organizational stories as a starting point for identifying groups within an organization.

Gregory (1983) has probably labored the most diligently to discover the nature of subcultures. She stresses the importance of the "native view" paradigm, in which organization members are allowed to tell their own stories, thus avoiding any preconceived notions the researcher may have concerning the nature of subcultures. Open ended questions are the primary methods employed to elicit information, e.g., questions like "What kinds of companies are there."

Gregory transcribes the interviews, and subjects the transcriptions to content analysis and systematic semantic structure analysis. The method proved to have considerable validity in establishing the existence of two distinct subcultures within a single organization.

Finally, Pettigrew (1979) found evidence that groups within an organization can be distinguished by varying degrees of commitment to the organization. He advocates longitudinal studies because of the dynamic nature of cultures. He used a variety of methods to collect data from members--interview, questionnaire, documentation and unobtrusive observation. Degree of commitment can then be measured by language content, that is, amount of overlap with official company doctrine.

#### Q-Methodology

Q-sort is a method of forcing a normal distribution, suitable, according to Rawlins (1968), for classifying respondents into groups based on attitudes toward the subject matter. It requires respondents to sort stimuli along a specific dimension. Respondents are then sorted, using factor analysis, into groups distinguished by differences in attitudes.

Q-sort offers the researcher a number of advantages. Most important is its suitability for exploratory studies (Kendall, 1984), combining features of both qualitative and quantitative methodology. Qualitative features allow exploration of possible groupings in considerable detail. Quantitative features allow the study to be replicated, verified, and expanded in further studies.

Another advantage of Q-sort is that sample sizes need not be large. The assumption is that the sample is large enough to include representatives of all major subgroups. Proportional representation of those groups among the sample is not important. If only a few representatives of each group are present, then further study of the nature of those subgroups is possible.

A third advantage is that the Q-sort technique results in more precise comparative information than the qualitative, anthropological procedures discussed earlier. When the subject matter of a study is known to respondents, as is the case with this study, there is a tendency for the "strongly agree" bias to emerge. Forcing respondents to categorize responses in a normal distribution eliminates this potential bias.

There is another advantage of the forced normal distribution. That is, it eliminates the tendency of some

respondents to drift toward one extreme or the other as they work their way through the questionnaire.

#### DSS User Behavior

There have been a number of studies which have examined individual behavior with regard to computer based information systems. Numerous questionnaires have been designed to tap kind and degree of user involvement and technical suitability of information systems, e.g., Hamilton and Chervany (1981), Olson and Ives (1982), Bartol and Martin (1982), Goldstein and Rockart (1984), and Bailey and Pearson (1983). The consensus is that users are competent judges of their own satisfaction with systems.

The other characteristics of DSS user behavior-- quantity and quality of usage and system effectiveness-- were also measured by the questionnaire method. To format these questions, it was necessary to elicit information during the interview stage, and verify, modify, and supplement that information through observation and investigation of documentation. One reason that this step is necessary was to formulate questionnaire items in the language of the respondent. A second reason is that many of the questions are industry or organization specific.

For example, several hours of DSS usage per year may be considered frequent usage in some companies, infrequent in others.

### Procedure

The study proceeded through several stages. The first stage was to interview Computer Data Systems (CDS) personnel to determine characteristics of decision support usage in the organization. These interviews were followed by interviews in the functional areas to more sharply define organizational culture. Additional information with regard to DSS usage was also elicited. Observation was used to supplement and modify this information.

The interview and observation stage was completed by formulating 48 culture statements and a DSS usage questionnaire. The Q-deck statements and the questionnaire were then pilot tested and subsequently modified before proceeding with the study itself.

### Interview

The first step in the collection of data was to conduct interviews with selected organization members. Interviewees from CDS were selected largely from the three levels below the level of CDS Manager, and included

discussion with a total of six managers. For additional insight, further interviews were conducted with two lower level employees.

Interviews with CDS officials were open-ended, and initially, very general. The interviews began with the researcher providing brief background information about the purpose of the interview. The first category of questions was directed toward determining CDS conceptions of DSS, and which functional areas made heaviest use of DSS. The second category of questions asked interviewees to describe customer attitudes toward CDS, customer level of satisfaction, frequency of customer usage, quality of DSS usage, effect on organizational decision making, and how these issues were evaluated.

The questions were open-ended. When particularly thorny DSS issues were raised, for example with the justification process, follow up questions were asked to more fully describe the issue. In addition, if the interviewee spontaneously generated statements with a cultural motif (ideology, myth, metaphor, or symbol), the reference was noted and the motif pursued, if warranted.

Each subsequent interview then incorporated more specific questions about DSS usage and cultural motifs as these subjects came to be better understood. For example,

each of the remaining CDS interviewees, after the completion of the first interview, was asked specific questions about the nature of the justification process.

In addition to the spontaneously generated cultural motifs, interviewees were specifically asked to comment on the essential ideology of the company. When appropriate, the interviewees were also asked for specific examples that might illustrate the ideology.

Based on the issues raised by the CDS interviewees, a more specific set of questions was formulated for use with the three functional areas. There were three interviews, one for each of the functional areas. The interviews lasted from one to one and one-half hours each, and were conducted with the head of investments, operations, and marketing. For each of the interviews, the head was accompanied by a chief subordinate, who served in a complementary fashion.

The primary purpose of the interviews was to more sharply define subcultures and DSS user characteristics from the perspective of organizational members. The nature of organization subcultures must arise from those intimately associated with the organization.

To elicit information about company ideology, interviewees were asked to describe the organization in



general terms, what kind of culture the organization is trying to promote, and how successful the company is in promoting the culture. The value of questions like this in getting individuals to describe an organization's culture in their own terms is strongly recommended by Gregory (1983).

User satisfaction can be measured in a rather straightforward fashion: simply asking the respondent how satisfied he or she is with the system (Lucas, 1978b). Specific instances of dissatisfaction arise from posing the question. However, the other dimensions of user behavior are less well explored, and need further examination.

Therefore, questions about these characteristics were also asked at this time. Questions include: (a) is there an ideal amount of time for a member to spend with a DSS, (b) have you ever used a DSS in a new, unusual, or creative way, (c) have you asked that the DSS be modified, (d) what are some examples of how you--or someone else--have changed a DSS, (e) how do you know if the DSS is doing what you--or the organization--wants it to, (f) how do you know if the modifications are worthwhile.

### Interview Procedure

The first step in conducting the six interviews was to establish rapport with the individual, aided by the fact that the interview occurred in familiar surroundings. Interview questions were open ended and directed by appropriate company documentation, and follow up questions in each of the areas were asked if the topic appeared promising.

As an aid to eliciting this information, the STROBE technique, developed by Kendali and Kendall (1981, 1984a, 1984b), was used. Basically, STROBE is used in conjunction with interviews to confirm, negate, question, modify, or supplement data through structured observation of, for example, office location and equipment, office lighting, color, graphics, and clothing of the subject.

Use of the technique ultimately resulted in the formulation of several of the Q-deck statements. The technique was particularly appropriate for exploring the use of symbols. For example, several interviewees commented at some length about the tradition-busting symbols found in some areas of CDS. Observations about the number of employees rushing to and fro also sparked comment.

After the interviews were concluded, cultural remarks were winnowed to 48 representative statements, twelve for each of the four cultural dimensions. Statements were written, as much as possible, in language familiar to organization members. In effect, six sets of statements exist for each dimension to allow for reverse statements in order to establish reliability.

#### The Pilot Study

The primary purpose of the pilot study was to ensure that questions were clearly understood by respondents. Five individuals were chosen for this purpose. Respondents included representatives from several of the hierarchical and functional areas, the relevant demographic categories here.

After the appropriate instructions, subjects Q-sorted the 48 cultural statements along the dimension of strongly agree-strongly disagree. Each statement was typewritten on a separate 3 x 5 inch index card. Thus, the Q-deck consisted of 48 cards. The cards were sorted into eleven piles, distributed as follows:

1 - 2 - 4 - 6 - 7 - 8 - 7 - 6 - 4 - 2 - 1.

The numbers refer to the number of Q-deck cards to be placed in each pile. To facilitate sorting, each sorter

was provided with a 40 x 8 inch board of navy blue tagboard. The eleven spaces for sorting the cards were clearly marked, as was the number of allowed cards per pile. In addition, one end of the board was marked strongly agree; and the other, strongly disagree.

The statements were randomized (shuffled) to avoid any kind of bias inherent in the order of presentation. For the pilot study, the Q-sorting occurred in groups of one or two, so that individual attention could be given to respondents' comments at the conclusion of the session.

After the Q-sort, individuals completed the DSS usage questionnaire. At the conclusion of each session, participants were interviewed to determine what questions should be changed to promote understanding, how those statements should be changed, and whether there were additional questions which should be asked.

The interviews resulted in minor revisions to seven of the Q-deck statements. Six of the changes were to enhance the clarity of the statement. The most extensive change occurred with the statement: "In order to get what you need, it is often necessary to 'fight over the bones.'" It was agreed that the statement would be more clear if it were recast as "In order to be successful at your job, it is often necessary to engage in real

'dogfights.'" In addition, one statement was modified by removing a vulgarity.

The DSS usage questionnaire was also modified slightly. The initial instructions were expanded and clarified, and three of the usage statements were made more specific. One usage statement was added to the list. The description of the hierarchical categories was revised extensively.

#### Categorizing the Q-Deck Statements

After the pilot study was conducted, it became apparent that subcultures could not be expected to vary along the cultural dimensions. The four cultural dimensions were set up to give a rounded view of the subcultures. However, the 48 cultural statements could be grouped into five rough categories which were expected to be useful in analyzing the emergent subcultures. These five categories are : (a) attitude toward the company, (b) response to the work environment, (c) company policy, (d) professionalism, and (e) response to systems staff.

General Attitude Toward the Company. The seven statements dealing with the first category are listed in Table 3-1. This category of statements is deeply rooted in individuals' reactions toward symbolic interpretations of

Table 3-1

## Statements Regarding Attitude Toward Company

- 7 The company logo, with its emphasis on character, integrity, helpfulness, and wisdom, summarizes what the company is all about.
- 9 The T-shirt parodying the company has done real damage to the company's image.
- 32 The company's television show has done a good deal to promote a very positive image of the company.
- 33 The company's logo is outdated.
- 34 Many of the most influential people in the organization are glorified "bean counters."
- 35 How other employees dress has little effect on my dealings with them.
- 46 The dress code at the company helps create a favorable impression of the company.

the company. The first four of the seven statements deal with official symbols of the company. Statements in this category reflect public perceptions of the company and its larger role in society. Individuals who agree with statements 7 and 32 can be expected to be imbued with the company culture. The same point can be made with regard to statements 9 and 33 for those who disagree.

Statement 34 falls in this category, at least for those individuals who identify strongly with the company and resent the implication that company leaders are nothing more than "bean counters." Statements 35 and 46 also belongs in the category for those who believe that dressing appropriately promotes a positive image of the company--and who identify with that positive image.

Response to the Work Environment. Table 3-2 lists the nineteen statements which are included in the second category. There were more statements for this category than any other. The large number of statements in this category is attributable to the fact that the cultural dimensions were, for the most part, spontaneously generated and the work environment is the category with which employees have the closest day-to-day contact.

The focus of virtually all the statements is on the nature of the relationships between employees and other

Table 3-2

## Statements Regarding Work Environment

- 2 It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.
- 6 In order to succeed in this company, it is imperative to know, to put it politely, how to "cover you act."
- 17 The company actively encourages employees to form friendships with other employees.
- 19 I know of several instances where employees from outside our area completely misunderstood a request, resulting in much confusion and delay.
- 22 People in other areas or divisions understand our way of doing things. We usually do not need to provide a great deal of explanation.
- 24 There are signs located in the stairwells, for example, the picture of a crow inscribed "We want your ideas caws they're worth crowing about." The signs really have little impact on how people think or act.
- 25 Management attempts to run the company like a smooth running machine.
- 26 The personal touches in our areas--photographs, posters, slogans, etc.--are desirable in creating a friendly atmosphere.
- 27 The suggestion boxes located on each floor of the building show that the company is really interested in your ideas.
- 28 The atmosphere here is pretty relaxed. There is time for comfortable conversation with other employees.
- 31 Individuals here are free to come up with new ideas, even to "fire blanks," provided they also "hit the target" often enough.



Table 3-2 (cont.)

## Statements Regarding Work Environment

- 36 Some of the usual work procedures don't make sense. However, trying to change the procedure is not worthwhile, because of the time and trouble.
- 38 In some ways, this company is like a large family.
- 39 Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.
- 40 Work here is fast-paced. For example, people in corridors are usually rushing from one place to the next.
- 43 People who can "go with the flow" are most likely to get the resources they want to do their job.
- 44 In order to be successful at your job, it is often necessary to engage in real "dogfights."
- 46 The dress code at the company helps create a favorable impression of the company.
- 48 The company has little real interest in how well employees get along together.

entities. The important element of that relationship is whether or not it is a pleasant experience for the employee.

For most of the statements in this category, the key relationship is between the employee and the company (statements 6, 17, 24, 25, 26, 27, 31, 36, 38, 39, 43, 44, 46, and 48). Statement 46 also occurs in the first category. This duality is not unique to this statement. Several of the statements can be interpreted in different ways by individuals belonging to different subcultures. For some individuals, statement 46 focuses not on the favorable company image but on the unofficial dress code, a condition which some individuals object to.

Statements 28, 38, and 48 focus on the relationships between employees. Statement 2 is included in this category because some individuals feel that the company is not quick to make the new employee feel welcome. Finally, statements 19 and 22 focus on relationships between different divisions or areas within the company.

*Company Policy.* Statements dealing with company policy are listed in Table 3-3. Seven of the ten statements in this category involve organizational change (statements 18, 28, 21, 29, 41, 42, and 47). The change theme quickly emerged in interviews, and it was a topic a number of

Table 3-3

## Statements Regarding Company Policy

- 3 Our division best knows how to handle its business. The less input from senior management, the better.
- 10 In order to make even a simple change in the way of doing things, it is usually necessary for suggestions to be reviewed by several different levels of management.
- 20 Everything changes very slowly here. The company is much the same as it was years ago.
- 21 This company is often a leader in the industry in instituting new ways of doing business.
- 25 Management attempts to run the company like a smooth running machine.
- 29 Top level officials often oppose changes in well established procedures.
- 30 There are quite a few influential people here who are surprisingly "wild"; that is, very imaginative in their approach to running the organization.
- 41 The company usually takes a "wait and see" attitude about making changes. That is, changes made in other companies are observed, and only the more successful experiments are implemented here.
- 42 Our company's corporate culture is in a great state of flux. Things will probably be much different five years from now.
- 47 When it seems advisable to make changes, senior management supports those changes rather quickly.

managers dealt with at some length. Quite a few of the interviewees suggested that the company was far from being an industry leader.

The focus of the remaining three statements in this category (statements 3, 25, and 30) is on the style or ability of top management to provide quality leadership. Statement 25 is another "dual" statement, also appearing in the second category. For work environment, the key phrase in the statement is whether or not the the company functions as a smooth running machine. For company policy, the emphasis is on how management runs the company.

*Professionalism.* The ten statements in this category are listed in Table 3-4. Statements 3 and 16 both explore the respondents' attitude toward suboptimization--whether the respondent realizes that resources are limited and that what is best for the division is not necessarily best for the company as a whole. It is assumed that a professionally-oriented individual would take exception to a policy of suboptimization.

Many principles of good management are universal--they apply to many kinds of organizations. The professional is likely to disagree with statement 8 and agree with statement 18.

Table 3-4

## Statements Regarding Professionalism

- 2 It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.
- 3 Our division best knows how to handle its business. The less input from senior management, the better.
- 4 In general, the best way of handling the increased workload in this division is to hire more staff.
- 8 This company is unique. We must do many things differently from other kinds of companies.
- 16 What is best for our division may not be best for the company as a whole.
- 18 Running this company is similar to running any large retail business.
- 23 In order to cope with the increasing number of demands on our division, we need to develop more efficient methods of accomplishing the work with the same number of people.
- 39 Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.
- 40 Work here is fast-paced. For example, people in corridors are usually rushing from one place to the next.
- 43 People who "go with the flow" are most likely to get the resources they want to do their job.

Whether or not the respondent holds a professional view of productivity is examined in statements 4 and 23. Statements 2 and 39 probe the respondents' attitudes toward the value of experience to the organization.

Several individuals took strong exception to the idea that the apparent hustle and bustle demonstrated true industry on the part of employees. These individuals complained that the energy released in the halls actually inhibited true work accomplishment. Thus, individuals who disagree with this statement are making a professional comment.

Statement 43 is another "dual" statement. Respondents who focus on "going with the flow" are more likely to reflect the work environment theme, whereas the professional focuses on resources needed to accomplish the task.

Response to Systems Staff. Table 3-5 list the four statements regarding reaction to CDS. There are no "dual" statements in this category, and all the statements are obviously categorized appropriately.

This theme did not emerge by design. Several questions dealing with the systems staff were included among the culture statements because of the number of interviews conducted in that area. Several individuals

Table 3-5

## Statements Regarding Reaction to CDS

- 1 In the manner of *Ghostbusters*, the Office Systems Division of CDS has recently posted "tradition buster" symbols throughout their floor. These symbols are good indicators of their increasing responsiveness to the needs of their customers.
- 5 CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.
- 12 The offices in CDS are often decorated with signs expressing the need to be "user friendly," but the people in CDS ignore the signs.
- 45 One of the most important functions of CDS is to "police" the utilization of computer resources.

reacted so intensely to these four statements that the statements were instrumental in developing the nature of one of the subcultures.

### The Sample

The study sample includes twenty four respondents. The sample size thus corresponds to the prescription advocated by Cragen and Shields (1981), who suggest one respondent for every two statements for a Q-sort. The respondents include virtually all users of DSS from three functional areas in the organization--investments, operations, and marketing.

The organization studied is a midwestern financial institution. The industry was selected because of the availability of DSS to a large number of employees. Only one industry is examined to avoid possible confounding with differences among organizational cultures.

### The Study

After completion of all Q-sorts and questionnaires, the cultural data were examined for groupings. Scoring for the eleven piles resulting from the Q-sort ranged from -5 to +5. Factor analysis was performed to group



individuals into one of the three subcultures. People who thus grouped together were said to be sharing a symbolic reality portrayed by their Q-statement groupings.

The last stage of the procedure was to code individuals into one of the three emergent subcultures. The three groups and four DSS dimensions were then correlated to examine differences in each of the three groups across the four DSS dimensions.

Simple correlations are used in order to compare the subcultures and demographic variables with DSS usage. Marks (1966) reports that for small sample studies, simple correlations outperform beta weights as predictors 75 percent of the time.

The results of the Q-sorts, the resulting subcultures, and comparisons with demographic and situational variables are described in Chapter Four. The results of the correlational analysis of these independent variables with DSS usage are described in Chapter Five.

## CHAPTER FOUR

### Q-SORT RESULTS

A number of interesting and valuable results were drawn from the data. In this chapter, the results of the factor analysis on the Q-sort data will first be discussed. Profiles of the three most meaningful factors will be drawn, describing the identifying characteristics of each of the three groups. The relationship between these three groups and the demographic variables are then discussed.

#### Three-Factor Analysis

Factor analysis was performed on the cultural data, exploring for three factors, four factors, and five factors. An individual was considered to load on a factor when the absolute value of the score was greater than 0.4. If the same individual loaded on more than two factors, the individual was considered to be a member of neither. Similarly, if the individual failed to receive a loading of greater than 0.4 (absolute value), then the individual was not considered to be a member of any factor.

Three-factor analysis proved to be the most valuable. Nine persons loaded on factor one; five persons, on factor two; five persons, factor three; and five persons, no

factor at all. Inter-factor correlations were reasonably low. Factor one correlated  $-0.057$  with factor two and  $-0.174$  with factor three. Factors two and three correlated  $-0.285$ . More importantly, each factor was readily subject to logical interpretation.

Four-factor analysis was not nearly as satisfactory. Only 16 persons loaded on any of the four factors, compared to a total of 19 for three-factor analysis. In addition, the absolute value of intercorrelations averaged  $0.214$ .

Five-factor analysis proved more interesting than four-factor analysis. Twenty-one individuals loaded on one of the five factors, and the absolute value of intercorrelations averaged a reasonable  $0.254$ . However, the five factors were not nearly so readily subject to logical interpretation as the three-factor analysis.

For these reasons, it was decided to proceed exclusively with three-factor analysis. For reasons developed below, the three factors have been named as follows: factor one is termed "loyalist subculture"; factor two, "reformer subculture"; and factor three, "anti-systems subculture."

### Analysis of the Q-Deck Statements

To clearly understand the nature of each of the three subcultures, statements which the typical member of each group is most likely to agree or disagree with are examined in detail. For each group, the statement receiving the strongest agreement is scored as +5. The two statements receiving the next highest support are scored as +4, and so on until each statement has received a score ranging between +5 and -5. Thus, eight statements for each group will be scored as zero, and one statement for each group as -5.

Each group is then examined for statements strongly agreed with, those statements scoring at least +3; and for statements strongly disagreed with, those scoring -5, -4, or -3. Thus 14 of the 48 statements, a little more than one-fourth the total, are considered as exhibiting strong feelings.

In addition, the statements scoring as +2 or -2, a total of twelve statements, are also examined, with the expectation that these scores show mild agreement or mild disagreement, respectively. Looking for mild emotional response enriches the understanding of each of the subcultures.

Statements scoring as +1, 0, or -1 are not examined specifically. Together, these statements include 22 of the 48, accounting for nearly half the total number. These statements are more difficult to interpret, because neutral scores can indicate neutrality, indifference, or a failure to understand the statement. Thus, these statements do not sharply characterize the groups, except as indicated below.

In addition to looking for statements showing strong and mild reaction, statements which are scored significantly different from the other two groups are also examined in some detail. The rationale is that understanding of the nature of a group is enhanced by examining how members of a group differ from all others. Special significance is then attributed to those statements for which the group reacts in a distinct manner.

#### The Thematic Framework

Finally, the statements are examined in a thematic framework. That is, the 48 statements were grouped in five thematic categories, as shown in Tables 3-1 through 3-5. The five categories became apparent from an analysis of the Q-sort data, and from comments written by the

respondents at the conclusion of the survey sessions.

Attitude Toward the Company. The first category, the groups' general attitude toward the company, is deeply rooted in individuals' reactions toward symbolic interpretations of the company. Statements in this category reflect public perceptions of the company and its larger role in society.

Response to Work Environment. The second category is narrower in focus, and can be summarized as the groups' response to their work environment. The chief concern here is the degree to which the company provides a pleasant work experience.

Company Policy. The third category includes those statements most closely associated with company policies. Thus, statements dealing with senior management, particularly those associated with the company's role in a changing environment, are included in this category.

Professionalism. The fourth category is associated with a professional theme. It includes those statements that are task oriented, statements that view the organization as a backdrop against which professional activities are performed.

Response to Systems Staff. The final category emerged serendipitously. Because many interviews were conducted with individuals in Computer Data Systems (CDS), and because the study was sponsored by the systems area, four of the culture questions concerned the role of CDS. Response to the CDS questions was so strong, particularly by the third group, that reaction to the systems staff is considered to be the fifth thematic category.

It should be mentioned that, in some instances, statements are regarded as belonging to two categories. This overlapping is not particularly bothersome. To draw a parallel from semantics, it is possible for a word to have more than one meaning, depending on context. Thus, the general tenor of one group's response suggests that a particular statement is more suggestive of the group's response toward company policy, while for another group, the same statement may be more indicative of response toward professionalism.

#### Loyalist Subculture

The nine members of this group display a strong identification with the company. They view the company in a very positive light, regard the work environment as very pleasant, and support policies of senior management.

Attitude Toward Company. This group's strong attachment to the company is clearly evidenced by the enthusiastic agreement with statement 32 (Table 4-1). One respondent, in a written statement following the administration of the questionnaire, pointed out that the show provides "a very positive image of the company. It associates the company with family." Another wrote that "the show allows the company to get into the heads of many potential customers and produce worthwhile entertainment at the very same time. Long before I knew (about the industry) I knew about the TV show."

This interpretation is verified by the high score accorded statement 7 (Table 4-1), which emphasizes the character, integrity, helpfulness, and wisdom of the company. One "loyalist" writes that "the company should be proud of its reputation and is doing well in keeping it that way."

Strong support is also shown for statement 46 (Table 4-1). Here, the emphasis is on the latter half of the statement, creating a favorable impression of the company. The dress code, which is an unwritten company policy, is not resented by the "loyalists." One "loyalist" commented



Table 4-1

## Strongly Agree Statements for Loyalist Subculture

Statement	Score
32. Company sponsored television shows have done a good deal to promote a very positive image of the company.	+5
5. CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.	+4
7. The company logo, with its emphasis on character, integrity, helpfulness, and wisdom, summarizes what the company is all about.	+4
21. This company is often a leader in the industry in instituting new ways of doing business.	+3
26. The personal touches in our areas-- photographs, posters, slogans, etc.--are desirable in creating a friendly atmosphere.	+3
28. The atmosphere here is pretty relaxed. There is time for comfortable conversation with other employees.	+3
46. The dress code at the company helps create a favorable impression of the company.	+3

that "the way you dress reflects how much confidence you have in yourself.

Statements strongly disagreed with speak as forcefully as statements strongly agreed with. Thus, the "loyalists" energetically defend the company logo by strongly disagreeing with statement 33 (Table 4-2).

The "loyalists" also take exception to the thought that the T-shirt parodying the company has done real damage to the company's image (statement 9, Table 4-2). One respondent remarked that "the T-shirt is supposed to be funny. I don't think it has an effect on the company's image." Another writes that the T-shirt "was a political statement, entirely unrelated to the company."

Mild disagreement with statement 34 (Table 4-4) is also evidence that members of this group identify strongly with the company. Here, the "loyalists" object to the idea that influential people within the organization are glorified bean counters. The term "bean counter" is most certainly pejorative, and the group rejects the notion that their company can be so typified.

The defense of the company logo is clearly seen when comparing the "loyalists" response to statement 7 (Table 4-5) with the other two subcultures. The statement's highest score from the other groups is only +1. Because

Table 4-2

## Strongly Disagree Statements for Loyalist Subculture

Statement	Score
44. In order to be successful at your job, it is often necessary to engage in real "dogfights."	-5
3. Our division best knows how to handle its business. The less input from senior management, the better.	-4
36. Some of the usual work procedures don't make sense. However, trying to change the procedure is not worthwhile, because of the time and trouble.	-4
4. In general, the best way of handling the increased workload in this division is to hire more staff.	-3
9. The T-shirt parodying the company has done real damage to the company's image.	-3
33. The company's logo is outdated.	-3
48. The company has little real interest in how well employees get along together.	-3

Table 4-3

## Mildly Agree statements for Loyalist Subculture

Statement	Score
15. Senior management is usually very supportive of new ways of doing things.	+2
17. The company actively encourages employees to form friendships with other employees.	+2
25. Management attempts to run the company like a smooth running machine.	+2
27. The suggestion boxes located on each floor of the building show that the company is really interested in your ideas.	+2
38. In many ways, this company is like a large family.	+2
39. Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.	+2

Table 4-4

## Mildly Disagree Statements for Loyalist Subculture

Statement	Score
2. It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.	-2
6. In order to succeed in this company, it is imperative to know, to put it politely, how to "cover your act."	-2
20. Everything changes very slowly here. The company is much the same as it was years ago.	-2
24. There are signs located in the stairwells, for example, the picture of a crow inscribed "We want your ideas caws they're worth crowing about." The signs really have little impact on how people think or act.	-2
29. Top level officials often oppose changes in well established procedures.	-2
34. Many of the most influential people in the organization are glorified "bean counters."	-2

**Table 4-5**  
**Distinctive Agree Statements for Loyalist Subculture**

Statement	Score	Closest Score	Total Difference
21. This company is often a leader in the industry in instituting new ways of doing business.	+3	-4	15
25. Management attempts to run the company like a smooth running machine.	+2	-3	10
7. The company logo, with its emphasis on character, integrity, helpfulness, and wisdom, summarizes what the company is all about.	+4	-2	9
15. Senior management is usually very supportive of new ways of doing things.	+2	-1	9

the remaining group rated the statement as -2, there is a total difference of 9 rating points between the loyalist subculture and the other two groups.

**Response to Work Environment.** The "loyalists" support of the company image is inter-related with their view of the company as a pleasant work environment. While the "loyalists" do not generally accord this category the same depth of response as the first category, they more than make up for it with a uniformly broad response.

There is strong agreement with statement 26 (Table 4-1), in which the "loyalists" confirm that personal touches in individual work areas help create a friendly atmosphere. The "loyalists" also firmly agree that the company atmosphere is pretty relaxed, and that there is time for comfortable conversation with other employees (statement 28, Table 4-1).

Corroboration is provided by equally strong disagreement with statement 44 (Table 4-2), which indicates that this subculture perceives no savage "dogfighting" within the company. Additionally, strong disagreement with statement 48 (Table 4-2) shows that they view the company as having a real interest in how well employees get along together.

The breadth of the "loyalists'" perceptions of the company as a good place to work is indicated by the degree to which Table 4-3 is larded with responses addressing this theme. The "loyalists" agree that the company actively encourages employees to form friendships with other employees (statement 17, Table 4-3). One "loyalist" comments that company sponsored "sports teams, trips, Christmas choir, plays, etc., help employees get along better with each other. It gives the employee the idea they are more than just a robot working 8 till 5."

The "loyalists" also perceive the company as a smooth running machine (statement 25, Table 4-3) and as a large family (statement 38, Table 4-3). Interestingly enough, these two statements receive identical scores. The two metaphors are not necessarily disparate, as is often assumed in the literature. However, it should be noted that in this study, "smooth running" and "large family" both have pleasant connotations. Thus, it is not surprising that the "loyalists," given their close identification with the company, should react favorably to both statements.

The "loyalists" mildly agree with two more statements which show their approval of the company's working environment. They agree that the suggestion boxes



indicate that the company is interested in their ideas (statement 27, Table 4-3). They also believe that new employees are free to ask division heads challenging questions about procedures (statement 39, Table 4-3).

Clearly, mild disagreement with statement 6 (Table 4-4), showing the respondents downplaying the importance of political manipulation, also indicates the "loyalists'" positive view of the work environment. Similarly, disagreement with statement 24 (Table 4-4) indicates the "loyalists" feel that company signs located in stairwells do have a positive impact on employees, reinforcing the idea that the respondents believe their company cares for them.

It can also be argued that statement 2 (Table 4-4) supports the view. By indicating that it is not necessary to work for long periods before earning the paycheck, the respondents suggest that the company is quick to embrace the new employee.

That the "loyalists" differ markedly from the other two subcultures in perceptions of the work environment is shown by the appearance of a number of these statements in the distinctively agree and distinctively disagree tables. The "loyalists" differ sharply from the other groups in their agreement with statement 25 (Table 4-5), the only

group to agree that management attempts to run the company like a smooth running machine.

Similarly, the "loyalists" differ distinctly from others by being the only group to disagree with the necessity of "dogfighting" (statements 44, Table 4-6). In addition, they were the only group to disagree with the company signs having little impact on how employees think or act (statement 24, Table 4-6).

Finally, the "loyalists" are the only individuals who react neutrally to the statement that interdivisional communication operates smoothly. The other groups strongly disagree with this statement (Statement 22, Table 4-6). All four of these "distinctive" statements characterize the "loyalists" as firm believers in the company as a pleasant working environment.

Sharp disagreement with statement 36 (Table 4-6), in which the "loyalists" indicate that making worthwhile changes is worth additional time and trouble, can also be interpreted as supporting the company's environment. One "loyalist" writes that "I've found that always looking into the procedure and making a change if a better alternative procedure can be found is always worth the time and trouble involved. Such changes when worked for bring about a sense of self achievement and worth to the

Table 4-6

## Distinctive Disagree Statements for Loyalist Subculture

Statement	Score	Closest Score	Total Difference
44. In order to be successful at your job, it is often necessary to engage in real "dogfights."	-5	0	12
36. Some of the usual work procedures don't make sense. However, trying to change the procedure is not worthwhile, because of the time and trouble.	-4	-1	8
24. There are signs located in the stairwells, for example, the picture of a crow inscribed "We want your ideas caws they're worth crowing about." The signs really have little impact on how people think or act.	-2	+1	7
22. People in other areas or divisions understand our way of doing things. We usually do not need to provide a great deal of explanation.	0	-3	6

individual while saving valuable time spent in the future."

*Company Policy.* The third category, view of company policy, is also supported firmly by the "loyalists." The company is viewed as an industry leader in statement 21 (Table 4-1). Similarly, rejection of statement 3 (Table 4-2) indicates that the "loyalists" willingly accept input from senior management.

The "loyalists" mildly agree that senior management is supportive of change in statement 15 (Table 4-3) and mildly disagree with the opposite view (statement 29, Table 4-4), both statements further suggesting their support for top management. One "loyalist" describes senior management as "the ingredient that pulls our division together and supports our work."

The fact that the "loyalists" are the only group to view top management as innovative (statement 21 and 15, Table 4-5) is further evidence of their support. In addition, the "loyalists" are the only group which sees management operating the company as a smooth running machine (statement 25, Table 4-5).

*Professionalism.* The "loyalists'" intense reaction to the first three categories overwhelms responses to the last

two categories. For the most part, the "loyalists" are relatively neutral with regard to statements dealing with professionalism or CDS.

An exception to this generalization is the firm rejection of statement 4 (Table 4-2); indicating that increased workload is not best handled with increased staff suggests a mature view of management. Mild acceptance of statement 39 (Table 4-3), in which the "loyalists" assert that new employees are free to offer suggestions, can be interpreted in a similar fashion. "New ideas," writes one respondent, "are the basis for advancement in projects as well as an employee's attitude."

Similarly, mild rejection of statement 2 (Table 4-4) seems to indicate that the "loyalists" value the importance of expertise, even if that expertise is not gained through long association with the company. It should also be noted that the "loyalists" do not differ sharply with either of the other groups on professionalism as evidenced by the lack of entries in Tables 4-5 and 4-6.

Response to Systems Staff. Only one of the four statements dealing with respondents' views of CDS appears in the "loyalists'" tables. That statement reveals the "loyalists" react with explicit agreement to the role of CDS

as consultants (statement 5, Table 4-1). Once again, the "loyalists" do not differ sharply from the other groups on their views of CDS, evidenced by the absence of any of the four statements in Tables 4-5 and 4-6.

#### Reformer Subculture

The reformer subculture is typified by their enthusiastic rejection of company policies, their disdain of current senior management, and their views of the company as behind the times. On the other hand, the "reformers" score highly on professionalism.

Attitude Toward the Company. The "reformers" appear to have little interest in the public perception of the company. Apparently, they identify more with the profession than with the company. They do evince mild agreement with statement 32 (Table 4-9), acknowledging the importance of company sponsored television shows to public perception of the company. However, Table 4-11 reveals that the other groups endorse this view more wholeheartedly.

The only other company perception statement to appear on the tables for the "reformers" is statement 7 (Table 4-10). The "reformers" mildly reject the company logo as

Table 4-7

## Strongly Agree Statements for Reformer Subculture

Statement	Score
23. In order to cope with the increasing number of demands on our division, we need to develop more efficient methods of accomplishing the work with the same number of people.	+5
6. In order to succeed in this company, it is imperative to know, to put it politely, how to "cover your act."	+4
18. Running this company is similar to running any large retail business.	+4
5. CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.	+3
10. In order to make even a simple change in the way of doing things, it is usually necessary for suggestions to be reviewed by several different levels of management.	+3
19. I know of several instances where employees from outside our area completely misunderstood a request, resulting in much confusion and delay.	+3
43. People who can "go with the flow" are most likely to get the resources they want to do their job.	+3

Table 4-8

## Strongly Disagree Statements for Reformer Subculture

Statement	Score
39. Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.	-5
15. Senior management is usually very supportive of new ways of doing things.	-4
21. This company is often a leader in the industry in instituting new ways of doing business.	-4
22. People in other areas or divisions understand our way of doing things. We usually do not need to provide a great deal of explanation.	-3
25. Management attempts to run the company like a smooth running machine.	-3
31. Individuals here are free to come up with new ideas, even to "fire blanks," provided they also "hit the target" often enough.	-3
47. When it seems advisable to make changes, senior management supports those changes rather quickly.	-3



Table 4-9

## Mildly Agree Statements for Reformer Subculture

Statement	Score
16. What is best for our division may not be best for the company as a whole.	+2
20. Everything changes very slowly here. The company is much the same as it was years ago.	+2
24. There are signs located in the stairwells, for example, the picture of a crow inscribed "We want your ideas caws they're worth crowing about." The signs really have little impact on how people think or act.	+2
26. The personal touches in our areas-- photographs, posters, slogans, etc.--are desirable in creating a friendly atmosphere.	+2
29. Top level officials often oppose changes in well established procedures.	+2
32. Company sponsored television shows have done a good deal to promote a very positive image of the company.	+2

Table 4-10

## Mildly Disagree Statements for Reformer Subculture

Statement	Score
4. In general, the best way of handling the increased workload in this division is to hire more staff.	-2
7. The company logo, with its emphasis on character, integrity, helpfulness, and wisdom, summarizes what the company is all about.	-2
12. The offices in CDS are often decorated with signs expressing the need to be "user friendly," but the people in CDS ignore the signs.	-2
30. There are quite a few influential people here who are surprisingly "wild"; that is, very imaginative in their approach to running the organization.	-2
40. Work here is fast-paced. For example, people in corridors are usually rushing from one place to the next.	-2
45. One of the most important functions of CDS is to "police" the utilization of computer resources.	-2

Table 4-11

## Distinctive Agree Statement for Reformer Subculture

Statement	Score	Closest Score	Total Difference
6. In order to succeed in this company, it is imperative to know, to put it politely, how to "cover your act."	+4	0	10
18. Running this company is similar to running any large retail business.	+4	0	8
48. The company has little real interest in how well employees get along together.	+1	-2	7
19. I know of several instances where employees from outside our area completely misunderstood a request, resulting in much confusion and delay.	+3	0	6
32. Company sponsored television shows have done a good deal to promote a very positive image of the company.	+2	+5	6

summarizing the company's character, integrity, helpfulness, and wisdom. One "reformer" explains, "I have met many individuals within the company who do not seem to realize that our purpose is to ensure our customers' happiness.... From outside sources, I hear that there is a lack of helpfulness." The respondent goes on to suggest that much of this failure probably stems "from management procedures within the company."

Response to Work Environment. Strong agreement with statement 6 (Table 4-7) suggests that the "reformers" view the workplace as basically political, a battleground for fighting over scarce resources. The intensity with which the "reformers" feel this to be true is evidenced by the statement's appearance in Table 4-11. Whereas the "reformers" strongly agree with this statement, no other group agrees, even weakly.

Although agreement with statement 43 (Table 4-7), if one concentrates on the "go with the flow," might suggest a placid work environment, a more likely explanation is that the "reformers" view the "flowing" as a tactic to achieve resources needed to act in a professional capacity. This emphasis on task is evident from the comments of one respondent, who writes that "in a research area it is necessary to be flexible since one

will never have perfect circumstances."

There is plentiful evidence that the "reformers" regard the work environment as alienating and hostile. The "reformers" do not feel that newer employees have the freedom to offer suggestions for improvement (statement 39, Table 4-8). One "reformer" describes this situation as "highly unrealistic--it doesn't take office politics and upper management personalities into consideration." Another adds that "new employees are not even introduced to division heads.

Furthermore, it is disagreement with statement 39 that most sharply distinguishes the "reformers" from other subcultures (Table 4-12). The "reformers" rate this statement as -5, while no other group disagrees with the statement.

In addition, the "reformers" believe there is considerable interdepartmental misunderstanding (statement 19, Table 4-8; statement 22, Table 4-8). Agreement with statement 19 (Table 4-11) helps distinguish the "reformers" from other groups, as they are the only group to agree with the statement. Furthermore, the "reformers" do not feel that the company functions like a smooth running machine (statement 25, Table 4-8).

Table 4-12

## Distinctive Disagree Statements for Reformer Subculture

Statement	Score	Closest Score	Total Difference
39. Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.	-5	+1	15
31. Individuals here are free to come up with new ideas, even to "fire blanks," provided they also "hit the target" often enough.	-3	+1	10
46. The dress code at the company helps create a favorable impression of the company.	-1	+3	8
47. When it seems advisable to make changes, senior management supports those changes rather quickly.	-3	0	7

"Reformers" view the individual as having little freedom to make mistakes (statement 31, Table 4-8). This perception of alienation is another feature distinguishing "reformers" from other groups (Table 4-12), as the "reformers" are the only group to see the company as providing employees with little margin for error.

Furthermore, the "reformers" are the only group to agree that the company has little real interest in how well employees get along together (statement 48, Table 4-11). Likewise, they are the only subculture to disagree with the statement that the dress code helps create a favorable impression of the company (statement 46, Table 4-12). For the "reformers," it is reasonable to suggest that the objection is to the company imposed code.

The "reformers" mildly agree that the company's attempts to encourage communication have little impact (statement 24, Table 4-9), thus reinforcing this view. The "reformers" also mildly agree that personal touches are important in creating a desirable atmosphere (statement 26, Table 4-9). In light of their clear disapproval of the company's work environment, agreement with this statement can be most logically interpreted as an attempt to create a friendly island in an otherwise hostile world.

The "reformers" do not view work at the company as fast paced (statement 48, Table 4-10). For the "reformers," this view does not suggest a peaceful environment as it did for the "loyalists." For the "reformers," disagreement is more likely to indicate a dissatisfaction with the perceived lack of task orientation among others. This interpretation harmonizes with the "reformers" view of professionalism.

*Company Policy.* The "reformers" react copiously to those statements dealing with company policy, top management, and change. The "reformers" strongly agree that the company is encrusted with layers of bureaucracy (statement 18, Table 4-7). They are also in strong agreement that top management is not supportive of new ways of doing things (statement 15, Table 4-8), nor do they believe that the company is an industry leader (statement 21, Table 4-8).

The "reformers" do not believe that the company is run like a smooth running machine (statement 25, Table 4-8). Likewise, they do not believe top management responds quickly to changing conditions (statement 47, Table 4-8). Disagreement with this statement is a distinguishing feature between the "reformers" and the other groups (Table 4-12). The "reformers" are the only subculture to disagree



with the statement.

Further support for the "reformers'" views of company policy as nineteenth century is evident from the mild agreement to the slow pace of change (statement 28, Table 4-9) and to their view of top level opposition to change (statement 29, Table 4-9). One "reformer" writes that "with newer equipment and techniques you know you can develop a more efficient system." The same respondent suggests that "you have to wait for (top level officials) to leave the company, retire, or die before any changes can be made. And when they do leave you also find out how many other people didn't like the system and want it changed."

As could be expected, the reformers do not see the company's most influential members as being particularly imaginative (statement 30, Table 4-10).

Professionalism. It has already been shown how several of the statements indicate a professional orientation on the part of the "reformers." Their strongest support goes to statement 23 (Table 4-7), indicating a mature organizational view of productivity. One "reformer" writes that "productivity is the most pressing concern for this organization," and is emphatic in suggesting that

increased efficiency is imperative. The "reformer" adds that "the company is not doing enough to identify and implement productivity."

The "reformers" see parallels between the company and any large retail business (statement 18, Table 4-7). One "reformer" emphasizes that the company "should be run like any large retail business--when the greatest concern is the consumer's happiness with our product and service." Agreement with this statement is another distinguishing feature of the "reformers" (Table 4-11). Neither of the other two groups agreed with the statement, while the "reformers" not only agreed, but agreed very strongly.

They view the organization holistically (statement 16, Table 4-9). One respondent explains, "the way the immediate situation is perceived may or may not be the way that the company as a whole perceives it. In any effort that involves more than one interest, some give and take must be experienced."

Consistent with their views of professionalism, the "reformers" do not regard hiring of staff as the best method of coping with increased workload (statement 4, Table 4-10). In the view of one "reformer," the hiring of "new employees takes such a great initial effort that it could save time and money to develop more efficient

methods of handling increased workloads."

Response to Systems Staff. The "reformers'" views of CDS tend to be mildly positive. They strongly agree with the consulting role in statement 5 (Table 4-7). They offer mild support to the idea that CDS is "user friendly" (statement 12, Table 4-10). On the other hand, they also object to CDS in a policing capacity (statement 45, Table 4-10).

#### Anti-Systems Subculture

The anti-system subculture is, as the name suggests, most strongly typified by their violent rejection of CDS. Their position with regard to the other four themes can be summarized as lying somewhere between the positions of the other two groups.

Attitude Toward the Company. The "anti's" identify fairly closely with the company image, not as closely as the "loyalists," but much more so than the "reformers." The "anti's" react in a strongly positive fashion to the company sponsored television shows (statement 32, Table 4-13). They respond to this statement with the same intensity as did the "loyalists."

The comments of the "anti's" with regard to the television show echo the comments of the "loyalists." One "anti" suggests that the show is the "best form of advertising the company has ever encountered, while at the same time providing a good piece of family programming." Another writes, "When I first accepted this job, people back home would reference [the show], saying things such as 'Say hello to [the show's star].'"

There is additional evidence that the "anti's" identify closely with company image. They strongly agree that the dress code helps create a favorable impression of the company (statement 46, Table 4-13). This endorsement of the unofficial dress code shows that the "anti's" are conscious of public image, and strongly suggests that the "anti's" believe they have a stake in the favorable presentation of the company. Verification of this interpretation is provided by the strong disagreement to statement 35 (Table 4-14), in which the "anti's" reject the notion that how other employees dress has little effect on their dealings with them.

The subcultures' reactions to statement 9 serve as a fair barometer in assessing their response to public perception of the company. It will be remembered that the "loyalists" staunchly denied that the T-shirt parodying the

Table 4-13

## Strongly Agree Statements for Anti-Systems Subculture

Statement	Score
32. Company sponsored television shows have done a good deal to promote a very positive image of the company.	+5
12. The offices in CDS are often decorated with signs expressing the need to be "user friendly," but the people in CDS ignore the signs.	+4
17. The company actively encourages employees to form friendships with other employees.	+4
2. It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.	+3
16. What is best for our division may not be best for the company as a whole.	+3
23. In order to cope with the increasing number of demands on our division, we need to develop more efficient methods of accomplishing the work with the same number of people.	+3
46. The dress code at the company helps create a favorable impression of the company.	+3

Table 4-14

## Strongly Disagree Statements for Anti-Systems Subculture

Statement	Score
21. This company is often a leader in the industry in instituting new ways of doing business.	-5
5. CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.	-4
45. One of the most important functions of CDS is to "police" the utilization of computer resources.	-4
1. In the manner of <i>Ghostbusters</i> , the Office Systems Division of CDS has recently posted "tradition buster" symbols throughout their floor. These symbols are good indicators of their increasing responsiveness to the needs of their customers.	-3
22. People in other areas or divisions understand our way of doing things. We usually do not need to provide a great deal of explanation.	-3
25. Management attempts to run the company like a smooth running machine.	-3
35. How other employees dress has little effect on my dealings with them.	-3

company had done any real damage to the company's image (Table 4-2). The "reformers" are neutral with regard to the statement, and the "anti's" mildly disagree that the T-shirt has done real damage to company image (Table 4-16).

The reactions to these four statements comprise the total of the "anti's" response to public perception of the company. Thus, the "anti's" commitment to company image runs neither as deeply nor as broadly as does that of the "loyalists." However, their position with regard to these statements is, from the company's viewpoint, eminently correct.

**Response to Work Environment.** The "anti's" generally feel that the workplace is a satisfactory environment, as shown by strong belief that the company actively encourages friendships among employees (statement 17, Table 4-13). Furthermore, they regard the individual as relatively unshackled and the company as rather like a large family (statements 31 and 38, Table 4-15).

Mild agreement with statement 43 (Table 4-15) shows the "anti's" as endorsing a policy of "going with the flow." Finally, the "anti's" mildly disagree with the statement that the company has little real interest in how

Table 4-15

## Mildly Agree Statements for Anti-System Subculture

Statement	Score
31. Individuals here are free to come up with new ideas, even to "fire blanks," provided they also "hit the target" often enough.	+2
38. In many ways, this company is like a large family.	+2
41. The company usually takes a "wait and see" attitude about making changes. That is, changes made in other companies are observed, and only the more successful experiments are implemented here.	+2
42. Our company's corporate culture is in a great state of flux. Things will probably be much different five years from now.	+2
43. People who can "go with the flow" are most likely to get the resources they want to do their job.	+2
44. In order to be successful at your job, it is often necessary to engage in real "dogfights."	+2



Table 4-16

## Mildly Disagree Statements for Anti-Systems Subculture

Statement	Score
3. Our division best knows how to handle its business. The less input from senior management, the better.	-2
8. The company is unique. We must do many things differently from other kinds of companies.	-2
9. The T-shirt parodying the company has done real damage to the company's image.	-2
37. The company sometimes hires talented people on a very short term basis. Even though the company knows the person will soon leave, that person can make important contributions.	-2
40. Work here is fast-paced. For example, people in corridors are usually rushing from one place to the next.	-2
48. The company has little real interest in how well employees get along together.	-2

well employees get along together (statement 46, Table 4-16).

That their reaction to the workplace is somewhat ambivalent is shown by mild agreement to statement 44 (Table 4-15). Apparently, the "anti's" believe that "dogfighting" is a political fact of life at the company, in spite of their generally favorable view of the work environment.

The "anti's" general satisfaction with the work environment is also tempered by being somewhat insular. As the circle of associations within the company is broadened to include other areas, the satisfaction abates rapidly. The "anti's," like the "reformers" and unlike the "loyalists," strongly disagree that other areas understand their way of doing things (statement 22, Table 4-14).

That the "anti's" react to statements regarding the working environment with less intensity than do other groups is shown by the absence of any of these statements in either the distinctively agree or distinctively disagree tables. Furthermore, none of the "anti's" directed any of their written comments toward the workplace.

**Company Policy.** The "anti's" support of senior management is less than enthusiastic. Considered by itself, their

strong disagreement with the statement that the company is an industry leader (statement 21, Table 4-14) does not necessarily reflect a negative view of top management. Their position here could simply be their assessment of reality.

In the case of at least one "anti," the view of top management is colored by the negative reaction to CDS. The respondent writes that the last "company I was with was way ahead of this company in several areas." The primary example cited by this "anti" is that it is still necessary, for some applications, to use punched cards.

The "anti's" also strongly disagree that management attempts to run the company like a smooth running machine (statement 25, Table 4-14). The presence of both statements 21 and 25 indicates rather convincingly that there is less than wholehearted endorsement of the policies of senior management.

On the other hand, the "anti's" mildly agree with the statement that the company takes a cautious approach to change, adopting only those changes which are most likely to be successful (statement 41, Table 4-15). This statement, the reverse of statement 21, verifies that the "anti's" do not regard the company as an industry leader.

However, in this statement, a reticence to change is worded in a positive light. Perhaps, then, the most plausible interpretation of this subculture is that they, like top management, are often philisophically opposed to change, but find themselves occasionally disagreeing with top management policy.

Finally, the "anti's" are the only subculture to respond in an other than neutral fashion to statement 42 (Table 4-15). The anti's believe that the company is likely to undergo considerable change in the foreseeable future. Whether the "anti's" view this prospect with hope or alarm is less certain. Given the somewhat opposite reactions to statements 21 and 41 above, perhaps the safest interpretation of their views toward change are that those views are mixed.

Professionalism. Their reaction to the professionalism theme is also mixed. On the one hand, they strongly support the holistic view of the organization (statement 16, Table 4-13). Additionally, they mildly disagree with the idea that the division best knows its own business and that less input from senior management is best (statement 3, Table 4-16).

Furthermore, the "anti's" realize that increasing staff is not necessarily the best method of dealing with

increased workload (statement 23, Table 4-13). Their position with regard to all three statements suggests a mature view of the organization.

There is evidence that the "anti's" believe that the standards of professionalism are low at the company. They mildly disagree that work at the company is fast paced (statement 48, Table 4-16). In the words of one respondent, "maintaining my personal productivity is one of my biggest challenges in this organization."

On the other hand, they also view the company as unique by disagreeing with statement 8 (Table 4-16). Additionally, they regard experience within the company as extremely important (statement 2, Table 4-13). The anti's are the only subculture to agree with this statement (Table 4-17). As expected, the "anti's" strongly agree that it is necessary to work within the company for a lengthy period before truly earning the paycheck. Their position with regard to the importance of experience can be interpreted as suggesting that only experience gained within the company legitimates expertise.

It is difficult to condemn the "anti's" professionalism based on their reaction to the above two statements. The disagreement with statement 8 could stem more from identification with the company image than from

Table 4-17

## Distinctive Agree Statements for Anti-System Subculture

Statement	Score	Closest Score	Total Difference
12. The offices in CDS are often decorated with signs expressing the need to be "user friendly," but the people in CDS ignore the signs.	+4	-1	11
2. It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.	+3	0	8

any lack of professionalism. And agreement with statement 2 might more accurately reflect their conservative nature than indict their professionalism. In summary, the "anti's" generally are organizationally correct with regard to their attitude toward professionalism, but hold those views with considerably less intensity than do the "reformers."

Response to Systems Staff. The views of the "anti's" toward CDS are not at all mixed. They strongly agree that CDS personnel are not "user friendly" (statement 12, Table 4-13). One "anti" writes that "CDS works at its own speed. An 'A' priority job (most urgent) appears to get the same attention as a 'C' priority job. CDS seems to forget who the customer is." Another writes that CDS personnel "do not understand the psychology of the computer; people who have never had to work hard to learn tool use can't help those who do."

The "anti's" strongly disagree with the view that policing computer resources is an important function of CDS (statement 45, Table 4-14). In the words of one "anti," the function of CDS "is to provide data to customer areas on a timely basis if they have access to the data." Another writes that "CDS should be a source of

help and information in computer usage, not a policing unit, as they try to be here."

The "anti's," then, believe that the function of CDS is to serve in a consulting function. The "anti's" are clear in their belief that CDS has failed in this task, as their strong disagreement with statement 5 (Table 4-14) indicates. Additionally, they sharply disagree with the statement indicating that CDS personnel are becoming increasingly responsive to customer needs (statement 1, Table 4-14).

Clearly, the "anti's" differ sharply from the other subcultures in their views of CDS. The "anti's" strongly agree with statement 12 (Table 4-17). Other subcultures disagree with the statement. Similarly, the "anti's" are the only group to disagree with statements 5 and 1 (Table 4-18). It is apparent that the "anti's" have earned their sobriquet.

Given the "anti's'" generally favorable view of company image and general satisfaction with the work environment, it seems fair to conclude that this subculture is not by nature hostile or contrary. It seems fair to conclude that their perception of CDS as unresponsive to their needs is based largely on the nature of CDS, and not any "defect" in the makeup of an "anti."



Table 4-18

## Distinctive Disagree Statements for Anti-Systems Subculture

Statement	Score	Closest Score	Total Difference
5. CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.	-4	+3	15
1. In the manner of <i>Ghostbusters</i> , the Office Systems Division of CDS has recently posted "tradition buster" symbols throughout their floor. These symbols are good indicators of their increasing responsiveness to the needs of their customers.	-3	0	7
37. The company sometimes hires talented people on a very short term basis. Even though the company knows the person will soon leave, that person can make important contributions.	-2	+1	6

### Summary of the Subcultures

The "loyalists" react most enthusiastically toward those statements dealing with the public perception of the company, the statements which capsulize the essence of the company. This subculture, then, comes close to the Deal and Kennedy (1982) ideal. The "reformers" are generally neutral or indifferent with regard to these statements. The "anti's," on the other hand, identify closely with the images of the company, although not with the same intensity as the "loyalists."

The "loyalists" view the work environment in a positive fashion. They do not generally rate these statements with the same intensity as the first category, but leave little doubt that they regard the workplace with a uniform satisfaction. The "reformers," on the other hand, view working conditions at the company as alienating and hostile. The "anti's" give the workplace mixed reviews, but seem to register more satisfaction than dissatisfaction.

Once again, the "loyalists" are enthusiastic in their support of top management and organization policies. The "reformers" are just as enthusiastic in their repudiation of the policies. The "anti's" are mixed in their

reaction, with some of their disapproval stemming from their antipathy toward CDS.

Those statements dealing with professionalism, or dedication to the job rather than loyalty to the company, find the "loyalists" largely indifferent, with some endorsement of professional ideas. Conversely, the "reformers" give professionalism their strongest endorsement. The "anti's" views of professionalism are somewhat mixed, particularly in that they seem to value experience gained within the company over any other kind of expertise.

Both the "loyalists" and the "reformers" seem to give CDS a mild stamp of approval. The "anti's," however, are decidedly opposed to CDS, viewing systems personnel as more of a hindrance than a help.

In summary, the "loyalists" are company loyalists. The "reformers" are typified by their strong code of professionalism, with little dedication to the company. The "anti's" are most noteworthy for their opposition to CDS.

#### Demographics and the Subcultures

Several demographic and situational variables have been suggested as potentially important in the preceding

review of the literature. Interviews with CDS personnel established that functional department would be a key variable in understanding response to DSS usage. In this study, four situational/demographic variables are considered: functional department, sex, experience, and hierarchical level.

#### Functional Area

The first demographic/situational variable to be considered is functional department (Table 4-19). Three functional areas, all heavy users of DSS, are examined: investments, operations, and marketing. (The names of these areas have been generalized to disguise the company.)

The respondents here can be regarded as more of a population than as a sample. All DSS users in operations are represented, and all the users in both investments and marketing who were available at the time of the study are also represented. There were four users who were on vacation or who could not be spared.

The nine "loyalists" include respondents from all three of the functional areas. There are more "loyalists" from investments than could be expected statistically. Both operations and marketing include about as many respondents

Table 4-19  
Division by Subculture

	Invest- ments	Oper- ations	Marketing
"Loyalists"	4	4	1
"Reformers"	1	3	1
"Anti's"	1	1	3
Other	0	5	0
Total	6	13	5

as could be expected if there were relationship between subculture and functional area.

The five "reformers" are represented in all three divisions. Here, there seems to be no relationship between functional area and subculture. The number of respondents in each area are very close to what one would expect if they were randomly distributed.

The five "anti's" are distributed across all functional areas. The number in investments is what one could expect. However, there are fewer "anti's" in operations and more in marketing than what could be expected.

The five remaining respondents, who did not load on any of the three subcultures, were all from operations. It is worth noting that the five others include one near "loyalist," three near "reformers," and one near "anti." Thus, it could be said that the others category provides additional evidence that the functional areas distribute themselves across the subcultures in a rather random fashion.

Of all the relationships between subcultures and functional areas, the most striking exception to the pattern of randomness is the number of marketing personnel who are categorized as "anti's". This anomolous cell can

best be explained by the customer orientation inherent with marketing. If any staff function is perceived as not customer oriented, that function is likely to be viewed negatively by marketing, regardless of the performance of the function.

It is obvious that any prediction of subculture based on functional area would not be very successful. Representatives of each subculture are found in every functional area. It is therefore unwise to make any very meaningful generalization with regard to functional area and subcultures, other than there is a lack of any very strong relationship.

#### Sex

Table 4-20 shows the relationship between sex and the subcultures. Both the "loyalists" and the "reformers" include approximately as many males and females as might be expected if there were no strong relationship between sex and subcultures. However, there seems to be a strong relationship between males and the anti-system subculture.

It is questionable whether any very meaningful generalization can be made from this apparently strong relationship. For one reason, the 24 respondents comprise only a sample of the total number of DSS users in the

**Table 4-20**  
**Sex by Subcultures**

	<b>Male</b>	<b>Female</b>
<b>"Loyalists"</b>	<b>5</b>	<b>4</b>
<b>"Reformers"</b>	<b>2</b>	<b>3</b>
<b>"Anti's"</b>	<b>5</b>	<b>0</b>
<b>Others</b>	<b>1</b>	<b>4</b>
<b>Total</b>	<b>13</b>	<b>11</b>



organization. Another reason is that examination of the questionnaires reveals that there are many males who are well satisfied with CDS, and some females who are relatively dissatisfied with CDS, in spite of being categorized as a "loyalist," "reformer," or "other."

In general, then, it can be said that there is some tendency for anti-systems people to be male. Other than that, there appears to be no relationship between sex and subculture.

#### Experience

The third demographic/situation variable considered is length of experience using DSS (Table 4-21). The three categories are less than one year, one to two years, and more than two years.

There is a tendency for employees with less experience to fall into the loyalist subculture. Four of the five individuals with less than one year's experience are "loyalists," while only one of the ten with more than two year's experience is associated with this subculture. Perhaps then it is safe to say that new employees are more malleable, more susceptible to the company viewpoint. Only after they have established a certain amount of

**Table 4-21**  
**Experience by Subcultures**

	<b>6-12 Months</b>	<b>1-2 Years</b>	<b>2+ Years</b>
<b>"Loyalists"</b>	<b>4</b>	<b>4</b>	<b>1</b>
<b>"Reformers"</b>	<b>1</b>	<b>4</b>	<b>3</b>
<b>"Anti's"</b>	<b>0</b>	<b>1</b>	<b>4</b>
<b>Others</b>	<b>0</b>	<b>3</b>	<b>2</b>
<b>Total</b>	<b>5</b>	<b>12</b>	<b>10</b>

credibility do they feel comfortable in departing from the company line.

There is no relationship between experience and the "reformers." The distribution is the same as one would expect if the numbers were placed randomly.

On the other hand, the "anti's" definitely tend to be more experienced. The explanation for this relationship may well be that the more experience individuals have with DSS, the more dealings they have with CDS. Thus, the more "opportunity" there has been for unpleasant experiences to occur.

It may also be true that there is a relationship between length of DSS experience and experience with the company. After all, much of the DSS usage in these three functional areas is mandated rather than optional.

"Older" employees may well be less likely to easily brook changes. This explanation is doubtful, however, because the "anti's," as a group, do not seem to be opposed to change per se. Instead, their hostility toward CDS is more directed toward the means of accomplishing the change.

Among the other respondents, there are no individuals with six to twelve month's experience. However, because this category of experience includes only five

individuals, the number is close to expectations if there were no pattern. The numbers in the other two experience categories are very close to expectations.

In summary, one can conclude that the "loyalists" tend to be less experienced, whereas the "anti's" tend to be more experienced. The "reformers" and other, conversely, show no pattern at all. Even though there is some relationship for both the "loyalists" and the "anti's," one could not predict the proper subculture with any great degree of confidence.

#### Level of Hierarchy

Table 4-22 shows the relationship between hierarchical level and subculture. Four hierarchical levels are included. In order of descending rank, they are officer, supervisor, professional/technical, and clerical.

The "loyalists" show no very definite association with hierarchical level, as the number of officers, supervisors, and technical/professional employees is what could be expected from random distribution. Because both clerical employees are categorized as "loyalists," and because there were no "loyalist" supervisors, it can be said

**Table 4-22**  
**Hierarchy by Subcultures**

	Officer	Supervisor	Technical/ Professional	Clerical
"Loyalists"	1	0	6	2
"Reformers"	1	2	2	0
"Anti's"	1	1	3	0
Others	0	1	4	0
<b>Total</b>	<b>3</b>	<b>4</b>	<b>15</b>	<b>2</b>

that there is a tendency for the "loyalists" to occupy the lower echelons.

For the "reformers," the numbers once again fall into a random pattern, except that technical and professional individuals are underrepresented. Therefore, there is some tendency for "reformers" to be more upper echelon. This association is hardly surprising, however, because the "reformers" were the group who scored most strongly on professionalism, which includes having an organizational perspective rather than an individual perspective. Once again, predictions of subculture based on belonging to the reformer subculture are low.

The "anti's" show very little association with hierarchical level. The numbers for all for categories are about what could be expected from a random distribution.

#### Summary of Demographic Variables

To summarize the relationship between subcultures and situational/demographic variables, it may be said that very few strong relationships emerge. The strongest associations are that marketing tends to be "anti," males tend to be "anti," and the "anti's" are more experienced while the "loyalists" are less experienced. It can be

concluded that subcultures, in general, cut across functional areas, sex, experience, and hierarchical levels. In short, a member of any of the subcultures can be anyone from any of the functional areas or hierarchical levels.

## CHAPTER FIVE

### SUBCULTURES AND DSS USAGE

The primary purpose of this chapter is to explore the relationship of the three organizational subcultures with characteristics of decision support system usage. The four categories of usage that will be examined are (a) satisfaction with the system, (b) quantity of usage, (c) quality of usage and (d) usage from the organization's viewpoint.

In addition to the association between the loyalist, reformer, and anti subcultures on the one hand, and DSS usage on the other, relationships between the demographic variables and DSS usage will also be considered. The four sets of demographic variables include (a) functional area, (b) sex, (c) length of work experience in the organization, and (d) hierarchical level.

#### Satisfaction

The DSS usage portion of the study consisted of administering a 25 item questionnaire. Of the 25 items, 13 deal with the respondents' views toward satisfaction. These thirteen statements are listed in Table 5-1. There are two reasons for this apparent disproportionate emphasis on user satisfaction. The first reason is that



Table 5-1

## Statements Regarding DSS Satisfaction

5. I would prefer instruction from CDS to be less technical.
8. It is easier to get results when making requests from Information Center Services (the "Info Center") than from other areas in CDS.
10. The justification reports for PC's and timesharing cover only tangible benefits; but less tangible benefits are often more important.
11. The annual rejustification process is much less important than the initial needs analysis.
13. Periodic evaluation of DSS usage enables our division to make more effective use of computer resources.
14. Info Center consultants often delay me more than help me.
15. Users should be allowed to write BASIC programs on the personal computers.
16. It is sometimes necessary to be "creative" with justifications for personal computers.
18. Sometimes, the most valuable DSS usage is the most difficult to justify.
20. The annual justification process provides senior management with the information they need to be confident that DSS usage is beneficial to the company.
22. We shouldn't have to justify micro or timesharing usage with CDS--individual areas should be responsible for their usage.
24. It should be easier to obtain nonapproved PC software.
26. I am satisfied with the DSS I am using.

CDS officials were keenly interested in this aspect of the study and specifically asked for the inclusion of several questions pertaining to this issue.

A second reason, as discussed in Chapter 3, is that usage is regarded as a multidimensional concept. The generally low intercorrelations in Table 5-2 justify the wisdom of this observation. Of the 78 intercorrelations, only eight are as high as 0.50 (absolute value).

#### Multidimensionality of Satisfaction

An examination of these eight high intercorrelations reveals that, in all cases, the correlations are in the expected direction, and that there are logical reasons to believe the two questions are sampling a similar aspect of the same dimension. Most of the high intercorrelations involve only two of the questions, numbers 14 and 22 (Table 5-1).

The focus of both these questions is centered on the helpfulness of CDS (or, in the case of question 14, a subdivision of CDS). The two questions themselves are highly correlated (0.52), indicating, for example, that individuals who felt that Info Center consultants were likely to cause delays also felt that micro or timesharing usage should not have to be justified with CDS.

Table 5-2  
Intercorrelations of Satisfaction Statements

	5	8	10	11	13	14	15	16	18	20	22	24
8	-0.15											
10	-0.12	-0.08										
11	0.21	-0.37	0.01									
13	0.23	-0.17	-0.20	0.20								
14	0.06	-0.58	0.14	0.35	-0.26							
15	0.25	0.13	0.12	0.07	-0.20	0.28						
16	0.21	-0.14	0.13	-0.02	0.24	0.31	0.32					
18	0.20	-0.21	0.59	-0.22	-0.08	0.24	0.15	0.50				
20	-0.18	0.14	-0.31	-0.38	0.42	-0.22	-0.43	-0.01	-0.08			
22	0.16	-0.61	0.12	0.55	-0.05	0.52	0.13	0.11	0.21	-0.56		
24	0.17	-0.31	0.23	0.20	-0.04	0.52	-0.16	0.32	0.29	-0.05	0.29	
26	-0.04	0.11	-0.30	0.39	0.19	-0.11	-0.37	0.09	-0.24	0.10	0.02	0.18

Statement number 8 asks respondents to evaluate the ease with which requests are satisfied compared to other areas of CDS. Responses to this question are similar to responses to statements 14 and 22. The intercorrelations are  $-0.58$  and  $-0.61$ , respectively. Thus, respondents who agree with statements 14 and 22 also tend to feel that service from ICS is inferior in general to the rest of CDS. Likewise, respondents who believe that the Info Center does not cause delays and who believe that micro or timesharing usage should be justified also tend to feel that service for ICS is superior to other areas of CDS.

Statement 11 is also highly correlated with statement 22 ( $0.55$ ). Statement 11 focuses on the importance of the rejustification process. Because statement 22 also probes feelings with regard to the justification process, it is not surprising that the two statements evoke similar responses. It can be argued that respondents who agree the rejustification process is much less important than the justification process might regard the rejustification process as not important at all, a hindrance to more important activities. In this sense, then, both statements are tapping the same dimension of satisfaction. This interpretation is bolstered by the fact that

statement 11 correlates moderately high (0.35) with statement 14.

A similar argument can be made for the results obtained with question 20, for which respondents indicate the extent to which they feel the justification process is a necessary control device for senior management. As might be expected, there is a large negative correlation between this question and question 22 (-0.56). Thus, those who believe that annual justification is a necessary process for senior management control also believe in the necessity of justifying timesharing or microcomputer usage. There is also a secondary negative association between question 20 and question 14 (-0.22).

Question 14 is highly intercorrelated with one other of the DSS usage questions, number 24 (0.52). Question 24 asks respondents whether it should be easier to obtain nonapproved PC software. The question is stated in such a way that the similarity to question 14 is fairly evident--both deal with perceived hindrances from CDS. However, question 24 is in reality another question concerned with the justification process, but the term is not specifically alluded to. Still, the "twin" nature of questions 14 and 22 is supported by the 0.29 correlation of questions 22 and 24.

Of the eight high intercorrelations, six deal with questions 14 and 22, the focus of which is the role of CDS as expeditors. The remaining two high intercorrelations involve question 18. Question 18 is highly correlated with question 10 (0.59) and with question 16 (0.50). Thus, individuals who feel that the most valuable DSS usage is the most difficult to justify (question 18) also feel that the justification reports for PC's and timesharing are of limited utility because they are concerned only with tangible benefits (question 10). The same individuals tend to feel that it is sometimes necessary to be "creative" with justifications for personal computers (question 16).

It might appear that these three questions were tapping the same dimension as questions 14 and 22, and indeed, to some extent, they are. For example, there is a mild correlation between questions 18 and 14 (0.24). Those who believe valuable DSS usage is difficult to justify also regard Info Center consultants as hindrances. Likewise, there is a mild correlation between questions 18 and 22 (0.21). Those who believe valuable DSS usage is difficult to justify also tend to believe that micro and timesharing usage need not be justified with CDS.

While all five questions are examining attitudes toward the justification process, either implicitly or explicitly, questions 10, 16, and 18 are much more narrowly focused. All three of these questions are concerned with the tangibility versus intangibility issue. Question 10 does so explicitly, while question 18 certainly implies that the most valuable DSS usage is intangible. Likewise, "creativity" in question 16 can be interpreted as meaning that one must be rather liberal with estimates of tangible benefits.

Finally, it should be noted that the most general of the satisfaction questions (number 26), which has respondents assess the degree of satisfaction with the DSS they are using, has no correlation with the other questions higher than 0.50 (absolute value). Indeed, the highest correlation (absolute value) of any of the other questions with general satisfaction is with question 11 (0.39). Apparently, dissatisfaction with the DSS can arise from a number of sources. Likewise, overall satisfaction with the system can be tempered by minor dissatisfaction stemming from one or more sources.

In summary, it can be concluded that several of the DSS usage questions are tapping similar aspects of the same dimension. In particular, questions 14 and 22 are

both concerned with the usefulness of CDS as consultants, and questions 10, 16, and 18 all deal with the difficulty of justifying intangible benefits. For the most part, however, the questions dealing with user satisfaction appear to be tapping different dimensions of the concept. Finally, there are no very strong associations between the several dimensions of satisfaction and overall satisfaction.

#### Relationships with Satisfaction

The remainder of this section examines the relationship between the satisfaction dimension on the one hand and the subcultural and demographic groups on the other. The first satisfaction dimension to be examined is the degree to which CDS hinders rather than helps users with regard to task accomplishment.

IDS as Consultants. Response to question 14, for which users evaluated Info Center consultants in terms of delaying task accomplishment rather than providing assistance, gave a mean of -1.8 (Table 5-3). (Scores ranged from -3, indicating strong disagreement with the statement, to +3, indicating strong agreement with the statement.) Thus, respondents in general evince mild disagreement with the statement.



**Table 5-3**  
**Mean Responses for DSS Statements**

Statement	Mean
2	2.46
3	0.25
4	1.46
5	-0.58
6	1.71
7	1.88
8	1.21
9	0.92
10	1.67
11	-0.04
12	2.42
13	1.42
14	-0.83
15	0.83
16	0.92
17	0.46
18	1.21
19	1.12
20	0.67
21	1.71
22	0.83
23	-1.33
24	0.00
25	1.54
26	1.29

The collection of subcultural and demographic variables is only moderately successful in predicting response to this question-- $r^2$  is 0.39. The only statistically significant correlation ( $p < 0.1$ ) with the satisfaction in this case is provided by the "anti's" subculture ( $r = -0.38$ ; Table 5-4). As might be expected, the "anti's" tend to agree that Info Center consultants are more hinderers than helpers. (For coding purposes, the questionnaire results were reverse scored: a response of +3 was coded as 1; a response of -3, as 7.)

On the other hand, "loyalists" may tend to disagree with the statement ( $r = +0.23$ ). Because there is a negative correlation between the "loyalists" and "anti's," it is safer to simply state that the "loyalists" do not clearly respond either positively or negatively to the statement.

Correlations between this measure of satisfaction and the three functional areas hover around zero. Sex, experience, and hierarchical level are all equally unsuccessful in portraying a strong relationship with this dimension of satisfaction. In brief, "anti's" agree that Info Center consultants are actual hindrances to task accomplishment, while "loyalists" do not agree. None of the other variables are strongly associated with the measure.

Table 5-4

## Correlations with Statement 14

Independent Variable	Correlation
Investments	-0.07
Operations	-0.09
Marketing	0.11
Sex	0.14
Experience	-0.17
Hierarchy	-0.14
"Loyalists"	0.23
"Reformers"	-0.01
"Anti's"	-0.38x

2

r = 0.39

x significant at  $p < 0.1$ 

14. Info Center consultants often delay me more than help me.

Area Micro Justification. Correlations of the variables with question 22 parallel, to some extent, the correlations with question 14. Question 22 asks users the extent to which they agree with this statement: We shouldn't have to justify micro or timesharing usage with CDS--individual areas should be responsible for their usage.

The mean response from all users to this question was 0.8, indicating that there is weak agreement with the statement (Table 5-3). However,  $r^2$  for this question is only 0.20. None of the correlations is statistically significant, but, as expected, the "anti's" may tend to agree with statement ( $r = -0.17$ ; Table 5-5) more so than the "loyalists" ( $r = +0.13$ ). In this case, the "reformers" agree with the statement to the same extent as do the "anti's." Once again, the results imply a very weak relationship between the statement and the demographic variables.

ICS Versus CDS. Questions 8, 11, and 20 all "hang together" to some extent, with the focus being on the justification process. Question 8 asks users the extent with which they agree with this statement: It is easier to get results when making requests from Information Center

**Table 5-5**  
**Correlations with Statement 22**

Independent Variable	Correlation
Investments	-0.06
Operations	0.15
Marketing	-0.12
Sex	0.06
Hierarchy	-0.12
"Loyalists"	0.13
"Reformers"	-0.18
"Anti's"	-0.18
2	
$r = 0.20$	

22. We shouldn't have to justify micro or timesharing usage with CDS--individual areas should be responsible for their usage.

Services than from other areas of CDS. Mean response to this question was +1.2 (Table 5-3), indicating a general weak agreement with the statement.

The  $r^2$  for the set of independent variables was a reasonably high 0.49. However, none of the correlations of the variables with the question are statistically significant (Table 5-6). While there are no very strong associations between the variables and the statement, it is worth noting that the response of the "anti's" is virtually the same as the response of the other two subcultures. One may suggest, therefore, that the antipathy of the "anti's" toward CDS does not derive from their relationship with ICS.

Initial Needs Analysis and Rejustification. Question 11 asks respondents the extent to which they agree that the annual rejustification process is much less important than the initial needs analysis. Mean response to this statement was virtually zero (Table 5-3), and the absolute deviation was greater for this question than for any of the others, indicating a broad spectrum of opinion.

The  $r^2$  for the set of variables was a low 0.25, and none of the correlations are statistically significant. The strongest association for this question is with the "reformers," ( $r = -0.33$ ; Table 5-7). "Reformers," then,

Table 5-6

## Correlations with Statement 8

Independent Variable	Correlation
Investments	0.15
Operations	-0.07
Marketing	-0.07
Sex	0.02
Experience	0.11
Hierarchy	0.18
"Loyalists"	0.17
"Reformers"	0.14
"Anti's"	0.07

$$r^2 = 0.49$$

8. It is easier to get results when making requests from Information Center Services (the "Info Center") than from other areas in CDS.

Table 5-7

## Correlations with Statement 11

Independent Variable	Correlation
Investments	-0.16
Operations	0.15
Marketing	-0.01
Sex	0.20
Experience	-0.09
Hierarchy	0.13
"Loyalists"	0.12
"Reformers"	-0.33
"Anti's"	-0.07

2

 $r = 0.25$ 

11. The annual rejustification process is much less important than the initial needs analysis.



are most likely to agree with this statement. A plausible interpretation of this result is that, given the "reformers" task-orientation, they can be expected to be most resentful of a process that might be perceived to interfere with the accomplishment of more necessary and pressing activities.

Rejustification and Senior Management. Question 20 asks respondents to what extent they agree that the annual justification process provides senior management with information they need for control purposes. Mean response to the question was a rather low 0.7, (Table 5-3) suggesting only a very weak agreement with the statement.

The  $r^2$  was a very low 0.12, and none of the correlations are statistically significant. The strongest associations are found among two of the subcultures (Table 5-8). The "anti's" are more likely to disagree with the statement ( $r = +0.22$ ), and the "loyalists" are more likely to agree with the statement ( $r = -0.22$ ).

PC Software. Question 24 addresses a more specific justification issue, whether it should be easier to obtain nonapproved PC software. Mean response to this question was zero (Table 5-3), with a large absolute deviation,

Table 5-8

## Correlations with Statement 20

Independent Variable	Correlation
Investments	0.06
Operations	-0.12
Marketing	0.09
Sex	-0.09
Experience	-0.02
Hierarchy	0.04
"Loyalists"	-0.22
"Reformers"	0.02
"Anti's"	0.22

2  
 $r = 0.12$

20. The annual justification process provides senior management with information they need to be confident that DSS usage is beneficial to the company.

once again indicating a broad spectrum of opinion with regard to the statement.

The  $r^2$  is a low 0.21, and none of the correlations are statistically significant. In this case, the strongest association is hierarchical level ( $r = -0.33$ ; Table 5-9), implying that higher levels are most likely to disagree with the statements. This result is not surprising, given that abandoning the policy represents a threat to higher level management control. It should also be noted that "anti's" are more likely to agree with this statement than either of the other two subcultures.

Importance of Intangible Benefits. Statements 10, 16 and 18 are all concerned with the justification process, but attention is here focused on the issue of intangible benefits. Statement 10 asks respondents to what degree they agree that the justification reports for PC's and timesharing cover only tangible benefits; but less tangible benefits are often more important. Mean response to the statement is a rather high +1.7 (Table 5-3).

The  $r^2$  for the collection of variables is 0.42, with two of the correlations statistically significant. The strongest association is for the "loyalists," who rather clearly disagree with the statement ( $r = 0.51$ ; Table 5-10). While the "loyalists" are apparently satisfied with

**Table 5-9**  
**Correlations with Statement 24**

Independent Variable	Correlation
Investments	0.00
Operations	-0.05
Marketing	0.06
Sex	-0.15
Experience	0.03
Hierarchy	-0.33
"Loyalists"	0.10
"Reformers"	0.19
"Anti's"	-0.19
2	
$r = 0.21$	

24. It should be easier to obtain nonapproved PC software.

**Table 5-10**  
**Correlations with Statement 10**

Independent Variable	Correlation
Investments	0.02
Operations	0.05
Marketing	-0.06
Sex	0.02
Experience	-0.31
Hierarchy	0.41*
"Loyalists"	0.51*
"Reformers"	-0.32
"Anti's"	-0.23

2

$r = 0.42$

\* significant at  $p < 0.1$

10. The justification reports for PC's and timesharing cover only tangible benefits; but less tangible benefits are often more important.

the status quo, both the "reformers" ( $r = -0.32$ ) and the "anti's" ( $r = -0.23$ ) appear to agree with the statement.

Also statistically significant is hierarchical level ( $r = 0.42$ ). For this study, upper hierarchical levels are the division heads, who bear primary responsibility for writing up the justifications, and are therefore most aware of the difficulty of quantifying the intangible. Thus, the division heads and their immediate subordinates seem to be acutely attuned to the importance of intangible benefits.

"Creative" Justifications. Question 16 asks respondents the extent to which they agree that it is sometimes necessary to be "creative" with justifications for personal computers. Mean response to this question is 0.92 (Table 5-3), indicating a general mild agreement with the statement.

The  $r^2$  for this statement is a low 0.29. None of the correlations are statistically significant. One can observe relatively marked differences between the responses of the "reformers" ( $r = -0.23$ ; Table 5-11) on the one hand and the responses of the "loyalists" ( $r = 0.19$ ) and the "anti's" ( $r = 0.23$ ) on the other. There may be a tendency, then, for "reformers" to regard the "creative"

**Table 5-11**  
**Correlations with Statement 16**

Independent Variable	Correlation
Investments	0.16
Operations	-0.23
Marketing	0.11
Sex	0.05
Experience	0.17
Hierarchy	-0.23
"Loyalists"	0.19
"Reformers"	-0.23
"Anti's"	0.18
2	
$r = 0.29$	

16. It is sometimes necessary to be "creative" with justifications for personal computers.

justifications as a game which must be played before more important tasks can be accomplished.

**Difficulty of Justification Process.** Question 18 asks respondents the degree to which the most valuable DSS usage is the most difficult to justify. The mean response to this statement is a moderately high +1.21, indicating that support for this sentiment is relatively high.

The  $r^2$  is a low 0.26. The only significant correlation is for the loyalist subculture ( $r = 0.34$ , Table 5-12). This result is consistent with the profile of the "loyalists." This subculture is the staunchest defender of the prevailing system, and can therefore naturally be expected to believe that the current procedure can readily justify most situations for which DSS usage is valuable.

Even though not statistically significant, the correlation for the "anti's" is in the expected direction (-0.20), indicating that there may be a tendency for "anti's" to agree that the system doesn't handle important DSS justification very well. And, once again, correlations for the other demographic variables are not significantly different from zero.

**DSS as Technical Consultants.** Question 5 is the first of the four remaining satisfaction statements. The statement



Table 5-12

## Correlations with Statement 18

Independent Variable	Correlation
Investments	0.28
Operations	-0.02
Marketing	-0.28
Sex	0.19
Experience	-0.30
Hierarchy	0.18
"Loyalists"	0.34*
"Reformers"	-0.21
"Anti's"	-0.07

2

 $r = 0.26$ \* significant at  $p < 0.1$ 

18. Sometimes, the most valuable DSS usage is the most difficult to justify.

asks respondents whether they would prefer less technical instruction from CDS. Mean response to this statement was -0.58, indicating a very mild disagreement with the statement (Table 5-3). The standard deviation was relatively large for this question (1.77), suggesting that there is a significant percentage of individuals who would prefer less technical instruction as well as a large percentage who would prefer more technical instruction.

The  $r^2$  is a moderately high 0.49. The only statistically significant correlation is with the "reformer" subculture ( $r = -0.35$ , Table 5-13). The "reformers," then, are the only group which agrees with the statement, who would prefer less technical instruction. The most plausible interpretation of this result is that the "reformers," who seem to be the most task-oriented of the three groups, view the understanding of the technical workings of the system as unnecessary detail in the accomplishment of tasks.

Somewhat surprisingly, the "anti's" have no very strong correlation with the question ( $r = .05$ ). The implication is that attempts to make the system more user friendly through less reliance on technical understanding will not have a major impact on reducing "anti" hostility.

**Table 5-13**  
**Correlations with Statement 5**

Independent Variable	Correlation
Investments	-0.31
Operations	0.31
Marketing	-0.05
Sex	0.22
Experience	0.13
Hierarchy	-0.15
"Loyalists"	0.04
"Reformers"	-0.35*
"Anti's"	0.05

2

$r = 0.49$

\* significant at  $p < 0.1$

5. I would prefer instruction from CDS to be less technical.

Correlations with the functional areas are, for this statement, high enough to warrant some mention. Investments is correlated  $-0.31$ , indicating that individuals in this department tend to prefer less technical instruction, whereas operations ( $+0.31$ ) tend to prefer more technical instruction. None of the other correlations are very different from zero.

Periodic Evaluation of DSS. Question 13 asks respondents the degree to which they believe periodic evaluation of DSS usage enables the division to make more effective use of computer resources. Mean response to this statement was  $+1.42$ , indicating a moderately high agreement with the statement. This result is somewhat surprising, in view of respondents' less positive reaction to other rejustification statements, e.g., statements 10, 11, 16, 18, and 20.

One possible explanation for this result is that many respondents may support the philosophy expressed by the statement, yet disagree with the current approach to periodic evaluation. It should be noted that statement 13 does not consider who is to conduct the evaluation--the phrase "periodic evaluation" is less closely coupled to the current process than the term "justification," found in the other statements dealing with the process.

The  $r^2$  for statement 13 is 0.38. The only significant correlation is with the reformer subculture ( $r = -0.34$ ; Table 5-14). The "reformers", then, are most likely to agree with the statement.

The result is not surprising, since the "reformers" can be expected to have a professional awareness of the necessity of control. However, agreement with the statement does not imply that the "reformers" agree with the current means of providing justification. It may well be that the "reformers" believe that the division should bear much of the responsibility for justification.

As might be expected, the "anti's" are noticeably less inclined to agree with the statement ( $r = 0.27$ ). Once again, differences between functional areas are marked enough to deserve comment. The operations area tends to disagree with the statement ( $r = +0.25$ ), whereas Investments is inclined to agree ( $r = -0.21$ ).

**BASIC Programming.** Statement 15 asks respondents whether users should be allowed to write BASIC programs on the microcomputers. The mean response to the statement is one of mild agreement, +0.83 (Table 5-3).

The  $r^2$  for the statement is a moderately high 0.52. As is the case for most of the satisfaction variables, the

Table 5-14

## Correlations with Statement 13

Independent Variable	Correlation
Investments	-0.21
Operations	0.25
Marketing	-0.08
Sex	0.04
Experience	0.10
Hierarchy	0.05
"Loyalists"	-0.24
"Reformers"	-0.35*
"Anti's"	0.27

2

 $r = 0.38$ \* significant at  $p < 0.1$ 

13. Periodic evaluation of DSS usage enables our division to make more effective use of computer resources.

only significant correlation is provided by one of the three subcultures. The "loyalists" have a +0.34 correlation with the statement (Table 5-15), indicating that this subculture tends to believe that users should not be allowed to do their own procedural programming. As expected, the "anti's" may tend to agree with the statement ( $r = -0.15$ ).

Satisfaction with DSS. The last of the satisfaction variables is statement 26, the degree to which the respondents are satisfied with the DSS they are using. Mean response to this statement was +1.29, indicating moderately high satisfaction with the DSS as they currently exist (Table 5-3). Standard deviation for this question was 1.76, suggesting that about a third of the respondents are at least somewhat dissatisfied with their DSS.

The  $r^2$  for the statement is a very low 0.17. It will also be remembered that the intercorrelations of the other satisfaction statements with this statement were relatively low. Likewise, none of the independent variables are correlated to a statistically significant degree.

The strongest of the correlations is that of hierarchy with general satisfaction ( $r = +0.24$ ; Table

**Table 5-15**  
**Correlations with Statement 15**

Independent Variable	Correlation
Investments	-0.05
Operations	-0.05
Marketing	0.12
Sex	0.32
Experience	-0.02
Hierarchy	-0.06
"Loyalists"	0.34*
"Reformers"	0.06
"Anti's"	-0.15

2

$r = 0.52$

\* significant at  $p < 0.1$

15. Users should be allowed to write BASIC programs on the personal computers.



5-16). This association may suggest that division heads are more inclined to be satisfied than are the lower levels. It can also be noted that the "loyalists" are more likely to be satisfied ( $r = -0.17$ ) than are the "anti's" ( $r = +0.15$ ).

*Summary of the Satisfaction Statements.* In general, respondents evince mild satisfaction with their DSS, and with procedures established with regard to the DSS. The differences in degree of satisfaction cannot reasonably be accounted for by demographic differences; the four sets of demographic variables were almost never correlated with the satisfaction statements to a statistically significant degree.

In a number of cases, one of the three subcultures was more successful in explaining variation. In all cases where the correlation with a subculture was statistically significant, the correlation was either in the expected direction or a plausible explanation of the association could be offered.

#### Quantity of Usage

The second category of usage statements is concerned with quantity of usage. Since the amount of DSS usage is

**Table 5-16**  
**Correlations with Statement 26**

Independent Variable	Correlation
Investments	-0.07
Operations	0.09
Marketing	-0.03
Sex	-0.04
Experience	0.05
Hierarchy	0.24
"Loyalists"	-0.17
"Reformers"	0.03
"Anti's"	0.15

2  
 $r = 0.17$

26. I am satisfied with the DSS I am using.

often dictated by the organization, except for relatively higher levels, in many respects, this is the least important of the four categories. Consequently, only one of the statements deal with quantity of usage.

*Frequency of Usage.* Statement 2 asks respondents to assess the frequency with which they use DSS. Mean response to the statement was a very high +2.46. The high degree of perceived usage is not surprising in that respondents from the three functional areas included practically everyone who used a DSS in that area. So, compared especially to the many non-DSS users in the organization, the result is hardly surprising.

The  $r^2$  for the statement is 0.35. There were, however, two statistically significant correlations. The strongest of these involves hierarchical level. Higher levels are associated with more frequent usage ( $r = 0.44$ ; Table 5-17). This result might best be explained by the fact that any computer usage at higher levels is likely to involve DSS; at lower levels, DSS usage is more likely to be more evenly mixed with other kinds of computer usage.

The second statistically significant correlation involves sex. Females are less likely to use DSS frequently ( $r = 0.36$ ). This relationship may be

**Table 5-17**  
**Correlations with Statement 2**

Independent Variable	Correlation
Investments	0.10
Operations	0.11
Marketing	-0.25
Sex	0.36*
Experience	-0.13
Hierarchy	0.44*
"Loyalists"	0.02
"Reformers"	-0.25
"Anti's"	0.04

2

$r = 0.35$

\* significant at  $p < 0.1$

2. I use DSS frequently.

chimerical, however, given the positive correlation between sex and hierarchy.

Of the three subcultures, only the correlation for the "reformers" ( $r = -0.25$ ) is worthy of note. The relationship indicates that the reformer subculture is more likely to use DSS more frequently. Once again, this relationship is perhaps somewhat attributable to the "reformers" tendency to occupy higher positions in the organizational hierarchy (Table 4-22).

#### Quality of Usage

The third category of statements is concerned with quality of usage. The nine statements from the questionnaire dealing with quality of usage are listed in Table 5-18. Since the primary purpose of decision support systems is generally regarded as improving the quality of decision making, this category of variables is quite important.

#### Multidimensionality of the Usage Statements.

Intercorrelations among the nine quality of usage statements are given in Table 5-19. Few of the intercorrelations are very high, suggesting multidimensionality of quality of usage.

Table 5-18

## Statements Regarding Quality of DSS Usage

3. One of the most valuable function of Lotus is its ability to perform "what if" analysis.
4. Most of the work we are currently doing with DSS will eventually become standard operating procedure.
6. I have used DSS in a new, unusual, or creative way.
9. I have had applications modified to better suit my needs.
12. DSS not only works faster, it often improves old ways of doing things.
19. Often, DSS is more valuable for understanding a problem better, rather than producing a specific result.
21. When DSS is used to develop a new application, the new method sometimes is found to be appropriate for another problem area.
23. The time saved with DSS is often used in unproductive ways.
25. Using DSS gives me a much better understanding of the problems or tasks I deal with.

Table 5-19  
Intercorrelations of Quality of Usage Statements

	3	4	6	9	12	19	21	23
4	0.24							
6	0.01	-0.11						
9	0.36	-0.08	0.33					
12	0.04	0.01	-0.06	-0.16				
19	0.09	0.12	0.24	-0.02	0.44			
21	0.07	0.61	-0.23	-0.15	0.32	0.37		
23	-0.58	0.15	0.03	-0.39	-0.02	0.20	0.21	
25	-0.07	0.10	0.16	-0.19	0.22	0.31	0.27	0.17

One set of quality of usage statements which do show evidence of forming into a group include statements 3 and 23, with a correlation of  $-0.58$ . Also related to these two statements is statement 9, which is correlated  $0.36$  with statement 3 and  $-0.39$  with statement 23. In point of fact, all three of these statements deal more with the kind of activity being performed than with quality of usage.

Statements 4 and 21 are also highly correlated ( $0.61$ ). Logically, the common focus of these two statements is that both probe the view of decision support systems as dynamic, their functioning changing to suit the demands of a changing environment.

A third set of variables is logically related, with a moderately high correlation of  $0.31$ . These are statements 19 and 25, both of which emphasize DSS as more process oriented than product oriented, focusing on improving the decision process rather than generating optimum solutions.

Other than these three rather distinct sets, intercorrelations among the quality of usage variables is ~~very~~ low, indicating that there are several distinct dimensions involved with quality of usage. The remainder



of this section explores the nine quality of usage statements in more detail.

**"What If" Analysis.** Statement 3 asks respondents the extent to which they agree that one of the most valuable function of Lotus is its ability to perform "what if" analysis. One of the distinguishing features of Lotus is its ability to perform this kind of analysis, and use of this feature does suggest high quality usage. However, it is only one kind of high quality usage provided by DSS, and its usage can be expected to be somewhat functionally dependent, that is, depending on the practical needs of the department.

Such indeed proved to be the case, as the strongest associations were with the functional areas. The  $r^2$  was 0.41, with two one of the independent variables statistically significant. The operations area was correlated 0.53 with the statement (Table 5-20), indicating that Lotus is more useful for other purposes than performing "what if" analysis. On the other hand, the investments area correlated -0.37, evidence that this kind of analysis was particularly useful in accomplishing investment-related tasks. While not statistically significant, the marketing department also apparently regards "what if" analysis as somewhat useful ( $r = -0.27$ ).

Table 5-28

## Correlations with Statement 3

Independent Variable	Correlation
Investments	-0.36X
Operations	0.53X
Marketing	-0.27
Sex	0.22
Experience	0.12
Hierarchy	0.22
"Loyalists"	-0.22
"Reformers"	0.23
"Anti's"	-0.19

2

 $r = 0.41$ X significant at  $p < 0.1$ 

3. One of the most valuable functions of Lotus is its ability to perform "what if" analysis.

None of the correlations between statement 3 and the three subcultures is statistically significant. It is worth noting, however, that both the "loyalists" and "anti's" may tend to agree with the statement ( $r = -0.22$  and  $-0.19$ , respectively, whereas the "reformers" may tend to disagree with the statement ( $r = 0.23$ ). The "anti's" hostility toward CDS apparently does not derive from a dissatisfaction with Lotus or "what if" analysis.

Unproductive Use of Time. Statement 23 asks users whether the time saved with DSS is often used in unproductive ways. This statement is highly correlated with statement 3 (Table 5-19;  $r = -0.58$ ), and shows that individuals who think "what if" analysis is valuable tend to disagree with statement 23. This strong relationship does not really offer much insight into differences of quality usage, unfortunately. Instead, it is probably an artifact of the relationship between statement 23 and the functional areas.

The  $r^2$  for the statement is 0.36, with none of the independent variables statistically significant. As might be expected, the mean response was  $-1.33$ , indicating general disagreement with the statement. There is a natural inclination for some individuals to react

personally to the statement, evaluating their own use of time, with the expectation that those individuals would tend to disagree most strongly with the statement. On the other hand, other individuals may be inclined to react more generally to the statement. There is no way to support these suppositions based on the collected data.

One may note that there does seem to be a weak association between functional areas and the statement, with operations tending to agree with the statement ( $r = -0.24$ ; Table 5-21) and marketing tending to disagree ( $r = 0.29$ ). However, the associations for the subcultures are equally strong, or, more properly, equally weak. The "reformers" may tend to agree with the statement ( $r = 0.32$ ) and the "anti's" may tend to disagree ( $r = 0.23$ ).

**Modification of Applications.** The third statement of this first group of quality of usage variables, statement 9, asks respondents to what extent they have had applications modified to better suit their needs. The mean response to this statement was  $+0.92$  (Table 5-3), indicating a very mild agreement.

The  $r^2$  for this statement is a very low  $0.17$ , with none of the independent variables statistically significant. The original intent of this statement was to probe the respondents' creativity, assuming that creative

**Table 5-21**  
**Correlations with Statement 23**

Independent Variable	Correlations
Investments	0.00
Operations	-0.24
Marketing	0.29
Sex	-0.09
Experience	0.01
Hierarchy	-0.24
"Loyalists"	0.11
"Reformers"	-0.32
"Anti's"	0.23
2	
$r = 0.36$	

23. The time saved with DSS is often used in unproductive ways.

individuals would more frequently have their DSS modified. However, none of the correlations with other "creativity" statements were very high (Table 5-19).

The strongest association with any of the independent variables is with a functional area, operations ( $r = 0.31$ ; Table 5-22). This correlation suggests that individuals in operations are less likely to have applications modified. None of the remaining correlations are high enough to bear comment.

The first group of quality of usage statements, then, can be summarized by stating that they do not tap quality of usage dimensions very successfully. If anything, they seem to be more task dependent, i.e., functionally dependent, than anything else.

Innovative Usage. Statement 6 asks users if they have used DSS in new, unusual, or creative ways. Mean response to the statement was +1.71 (Table 5-3), indicating that respondents feel their usage is highly innovative.

The  $r^2$  for this statement was a relatively high 0.59. Four of the correlations are statistically significant. As with the preceding set of quality of usage variables, functional area may be the most important factor in explaining innovative usage. This result is not entirely

**Table 5-22**  
**Correlations with Statement 9**

Independent Variable	Correlation
Investements	-0.18
Operations	0.31
Marketing	-0.19
Sex	-0.06
Experience	-0.06
Hierarchy	0.14
"Loyalists"	-0.11
"Reformers"	0.05
"Anti's"	-0.03
2	
$r = 0.17$	

9. I have had applications modified to better suit my needs.

unexpected, as organizational requirements for innovation may well differ from department to department. Thus, innovative usage is apparently more task dependent than is membership with a subculture.

The operations area is most likely to disagree with the statement ( $r = +0.41$ ; Table 5-23). This relationship indicates that DSS usage in operations tends to be more routine and structured. Marketing, on the other hand, rather strongly agrees that their usage is innovative ( $r = -0.38$ ).

Both hierarchical level and sex are correlated at a statistically significant level with statement 6. If routine DSS usage is delegated to lower organizational levels, one could expect that lower levels would disagree with the statement. Since there is a moderately high correlation between sex and hierarchical level ( $r = 0.31$ ), one could also expect that males would perceive themselves as performing less routine DSS operations. Such is indeed the case, as the correlations are  $+0.40$  and  $+0.61$ , respectively.

Although not statistically significant, results with the three subcultures are nevertheless interesting. Both the "reformers" and "anti's" tend to agree with the statement ( $r = -0.31$  for both). Apparently, both these



Table 5-23  
Correlations with Statement 6

Independent Variable	Correlation
Investments	-0.11
Operations	0.41*
Marketing	-0.38*
Sex	0.61*
Experience	-0.20
Hierarchy	0.48*
"Loyalists"	0.20
"Reformers"	-0.31
"Anti's"	-0.31

2

$r = 0.59$

\* significant at  $p < 0.1$

6. I have used DSS in a new, unusual, or creative way.

subcultures may feel compelled to use DSS in new, unusual, or creative ways, being less satisfied with routine usage.

Effectiveness. Statement 12 asks respondents the extent to which they agree with: DSS not only work faster, it often improves old ways of doing things. Mean response to the statement was +2.42 (Table 5-3), indicating strong agreement. The statement addresses the efficiency versus effectiveness issue, with the understanding that the primary goal of DSS is to improve the decision making process in terms of broadening the scope of problem analysis. Thus, agreement with the statement probes the users' understanding of the function of DSS.

The  $r^2$  for the statement was 0.56; however, none of the independent variables is correlated to a statistically significant degree. As with statement 6, both the "reformers" and "anti's" ( $r = -0.19$  for both; Table 5-24) may tend to agree more firmly with the statement than do the "loyalists." The highest correlation is for hierarchical level ( $r = 0.24$ ), indicating that higher organizational levels may have a better understanding of the primary function of DSS than do lower levels. The result is not surprising.

DSS Synergy. Statement 21 asks respondents to evaluate this statement: When DSS is used to develop a new

**Table 5-24**  
**Correlations with Statement 12**

Independent Variable	Correlation
Investments	-0.14
Operations	-0.05
Marketing	0.21
Sex	-0.11
Experience	0.06
Hierarchy	0.24
"Loyalists"	0.06
"Reformers"	-0.19
"Anti's"	-0.19
2	
$r = 0.56$	

12. DSS not only works faster, it often improves old ways of doing things.

application, the new method sometimes is found to be appropriate for another problem area. Agreement with the statement thus suggests higher quality of usage, since novel approaches to problem solving for one application are often transferable, to an extent, to other problem areas.

Mean response to the statement was +1.71, indicating that many users are aware of the synergistic effects of developing a problem solving approach. The  $r^2$  for the statement was a low 0.27, and only one of the correlations is statistically significant.

Females are more likely to agree with the statement ( $r = -0.37$ ; Table 5-25). This result is puzzling, particularly since higher organizational levels also show some tendency to agree with the statement ( $r = 0.17$ ). There is no ready explanation for this rather anomalous result, and further research into this particular quality of usage variable could prove very interesting.

Although not statistically significant, there is some tendency for the "anti's" to disagree with the statement ( $r = 0.22$ ) and for "reformers" to agree with the statement ( $r = -0.20$ ). Given the task-oriented nature of the "reformers," it is not surprising that they tend to look for transferability of problem solving approaches.

**Table 5-25**  
**Correlations with Statement 21**

Independent Variable	Correlation
Investments	0.16
Operations	-0.20
Marketing	0.08
Sex	-0.37*
Experience	-0.11
Hierarchy	0.17
"Loyalists"	0.16
"Reformers"	-0.20
"Anti's"	0.22
2	
$r = 0.27$	
* significant at $p < 0.1$	

21. When DSS is used to develop a new application, the new method sometimes is found to be appropriate for another problem area.

Movement Toward More Structured Decision Making.

Statement 4 asks respondents to evaluate this statement:

Most of the work we are currently doing with DSS will eventually become standard operating procedure. The question was designed to probe the extent to which respondents realize that DSS are attempts to bring some structure to otherwise unstructured problems. DSS also define boundaries for "solution" procedures, thus limiting the amount of required search. Therefore, agreement with the statement does not directly indicate quality of usage, but does indicate a mature understanding of the functioning of DSS.

Mean response to the statement was +1.46 (Table 5-3), indicating moderate agreement with the statement. The  $r^2$  was a low 0.22, and none of the correlations were statistically significant. The two strongest relationships are for two of the subcultures.

The "loyalists" tend to agree with the statement ( $r = -0.27$ ; Table 5-26), whereas both the "anti's" and "reformers" tend to disagree with the statement ( $r = 0.28$  and  $0.19$ , respectively). Rather than serving to evaluate quality of usage, the statement may be more useful for suggesting another source of discontent for the "reformers"

**Table 5-26**  
**Correlations with Statement 4**

Independent Variable	Correlation
Investments	-0.10
Operations	0.07
Marketing	0.03
Sex	0.03
Experience	0.24
Hierarchy	-0.03
"Loyalists"	-0.27
"Reformers"	0.19
"Anti's"	0.28
2	
$r = 0.22$	

4. Most of the work we are currently doing with DSS will eventually become standard operating procedure.

and "anti's." Here, the tendency to disagree with the statement may suggest that the "reformers" and "anti's" are dissatisfied with DSS becoming more routinized. These two subcultures may be more sharply aware of the necessity of DSS to be dynamic, ready to respond to environmental changes.

**Process Orientation.** Statements 19 and 25 both attempt to probe the degree to which respondents realize that one of the key features of DSS is its usefulness in better understanding problems, rather than generating optimum solutions. Statement 19 asks users to what degree DSS are more valuable for understanding a problem than for producing a specific result (see Table 5-18). Statement 25 is similar: Using DSS gives me a much better understanding of the problems or tasks I deal with.

Mean response to statement 19 was +1.12, whereas the mean response was +1.54 to statement 25 (Table 5-3). Users tend to agree with both statement, but the agreement is stronger for statement 25. The primary difference between the two questions is that statement 19 asks users to compare the process orientation directly with the generation of specific results. The two statements are positively correlated, but the correlation is only 0.31 (Table 5-20). The inference, then, is that there is a



body of users who feel that generating specific results may be as important, or more important than, increased understanding of the problem.

The  $r^2$  for statement 19 was 0.51. Only one of the correlations is statistically significant. The "reformers" agree relatively strongly with the statement ( $r = -0.48$ ; Table 5-27). This result is expected, since the "reformers" are more task-oriented, hence more interested in the computer as a support tool rather than an optimizing tool. The "loyalists," on the other hand, tend to be most opposed to the statement ( $r = 0.32$ ), and thus more interested in translating computer output directly into action, satisfied that the system is already relatively fine-tuned.

Also as might be expected, there is some tendency for higher organizational levels to agree with the statement ( $r = 0.27$ ). The correlation is close enough to statistical significance to suggest that the upper hierarchy has a deeper understanding of the nature and purpose of DSS.

Removing the direct comparison with generating specific results, as does statement 25, reduces some of the distinctions among the independent variables. The  $r^2$  is only 0.26. Once again, the only statistically

**Table 5-27**  
**Correlations with Statement 19**

Independent Variable	Correlation
Investments	-0.16
Operations	0.10
Marketing	0.05
Sex	-0.04
Experience	0.11
Hierarchy	0.27
"Loyalists"	0.32
"Reformers"	-0.48*
"Anti's"	0.12

2

 $r = 0.51$ \* significant at  $p < 0.1$ 

19. Often, DSS is more valuable for understanding a problem better, rather than producing a specific result.

significant correlation is with the "reformers" (Table 5-28), but the strength of the agreement has dropped from -0.48 to -0.34. The remainder of the correlations parallel those of statement 19 to a large degree.

Summary of the Quality of Usage Variables. For the most part, the independent variables are not greatly successful in explaining variation with the quality of usage variables. Significant correlations, when they do exist, are a little more likely to be with functional area than with any of the other demographic variables or with the three subcultures. The exception to this generalization is for the process oriented statements (numbers 19 and 25). There is a tendency for the "reformers" to be more aware of the process-oriented nature of DSS.

#### The Organizational Perspective

Two of the questionnaire statements are primarily concerned with decision making from the organizational perspective. That is, do DSS result in decisions which will benefit the organization. The two statements are numbers 7 and 17 (see Appendix B).

Organizational Effectiveness. Statement 7 asks respondents whether a DSS is one of the best means they

**Table 5-28**  
**Correlations with Statement 25**

Independent Variable	Correlation
Investments	0.12
Operations	-0.16
Marketing	0.07
Sex	-0.03
Experience	-0.23
Hierarchy	0.08
"Loyalists"	0.16
"Reformers"	-0.34*
"Anti's"	-0.03

2

 $r = 0.26$ \* significant at  $p < 0.1$ 

25. Using DSS gives me a much better understanding of the problems or tasks I deal with.

have for helping the company be more effective. Mean response to the statement was a relatively high  $+1.88$  (Table 5-3). The  $r^2$  for the statement was  $0.39$ , and only one of the correlations with independent variables is statistically significant.

The "reformers", as could be expected, agree most strongly with the statement ( $r = -0.37$ ; Table 5-29). Thus, the "reformers" are apparently agreeing that improved decision making is an integral responsibility. On the other hand, the "loyalists" are more likely to disagree with the statement ( $r = 0.33$ ), indicating that the "loyalists" believe that other responsibilities are more important. Given the nature of the "loyalists" as revealed by the Q-sort, other more important functions would include supporting top management and holding high the company banner.

None of the remaining correlations were statistically significant, but it is worth noting that operations may tend to disagree with the statement ( $0.22$ ) and marketing tends to agree with the statement ( $-0.21$ ). This difference is not surprising in light of the results in the quality of usage section, where it was discovered that operations tended to be more concerned with routine DSS usage.

Table 5-29  
Correlations with Statement 7

Independent Variable	Correlation
Investments	-0.06
Operations	0.22
Marketing	-0.21
Sex	0.30
Experience	-0.16
Hierarchy	0.10
"Loyalists"	0.33
"Reformers"	-0.37*
"Anti's"	-0.21

2

 $r = 0.39$ \* significant at  $p < 0.1$ 

7. A DSS is one of the best means I have for helping the company be more effective.

PC Effectiveness. Statement 17 asks respondents to evaluate this statement: Sometimes, users have done things with the PC's simply because they were available, not because the output was especially important. This question asks respondents to consider organizational effectiveness, as does statement 7. That the two statements are related is suggested by the correlation of the two statements ( $r = 0.31$ ; Table 5-2).

The  $r^2$  for statement 17 was 0.38, with two of the correlations statistically significant. The first of these is for a functional area, investments ( $r = +0.47$ ; Table 5-30). Thus, individuals in investments are most likely to disagree with the statement. Activities in this area may be more intense than for the other two areas, thus providing less opportunity for "experimental" usage.

The other statistically significant correlation is with experience ( $r = -0.34$ ), indicating that more experienced users have had more opportunity to observe or engage in "experimental" activities.

None of the correlations with the three subcultures were statistically significant. The "reformers" may tend to agree with the statement ( $r = -0.24$ ). This result is

**Table 5-30**  
**Correlations with Statement 17**

Independent Variable	Correlation
Investments	0.47*
Operations	-0.32
Marketing	-0.11
Sex	0.11
Experience	-0.34*
Hierarchy	0.10
"Loyalists"	0.17
"Reformers"	-0.24
"Anti's"	0.08

2

r = 0.38

\* significant at  $p < 0.1$ 

17. Sometimes, users have done things with the PC's simply because they were available, not because the output was especially worthwhile.



not surprising, since "reformers" can be expected to more readily observe departures for task-oriented activities.

#### Summary of the DSS Usage Statements

In general, the independent variables are not greatly successful in explaining variation of response to the 25 DSS usage statements. In the case of frequency of use and quality of usage statements, where statistically significant correlations exist, they are slightly more likely to be with the three functional areas.

For the nine quality of usage statements, there was a total of four statistically significant correlations with functional area. For both sex and subculture, there were only two statistically significant correlations. One statement correlated significantly with hierarchy, and none with experience. Thus, relationships here are more dependent on the nature of the task. However, the three subcultural areas were particularly important with regard to the process-oriented statements.

The one quantity of usage statement had two statistically significant correlations. One was with sex; the other, with level of hierarchy.

For the two statements probing organizational effectiveness,  $r^2$ 's were moderately low, with all of the

independent variables contributing a roughly equal share of statistically significant correlations. Functional area, experience, and subculture each contributed one statistically significant correlation. In the case of the most direct organizational effectiveness statement (number 7), however, the reformer subculture showed the strongest relationship.

For the thirteen statements involving satisfaction with DSS and with CDS, the three subcultures offered the greatest share of explanatory power, ranking ahead of all the demographic variables. The only statistically significant correlation for the demographic variables was with level of hierarchy. There were six statistically significant correlations for subculture.

In summary, subculture does nearly as well as the entire set of situational/demographic variables in explanatory power. Of the twenty statistically significant correlations, nearly half, nine, were with one of the three subcultures.

## CHAPTER SIX

### CONCLUSIONS

The purpose of this study was to determine whether or not subcultures exist within the overall culture of an organization. A further purpose, after establishing the existence of subcultures, was to determine their nature. Finally, how those subcultures vary in their DSS usage was investigated.

The remainder of this chapter discusses the implications of the study. First the limitations of the study are described. Then how the study extends understanding of the cultural literature is discussed. Implications of the study for upper management and for the systems development life cycle are investigated.

#### Limitations

With any kind of study, it is necessary for the researcher to make tradeoffs between explanatory power and scope of the research project. Because this study is largely exploratory in nature, several concessions in explanatory power were made to keep the scope of the project manageable.

Most of the limitations of the study were due to bringing a fresh methodology to a relatively new area of

interest--organizational culture, specifically the subcultures existing within the organization. Limitations include: (a) a small sample size, (b) lack of generalizability, and (c) lack of longitudinality.

#### Small Sample Size

The study sample included only 24 respondents, thus doubtless sharply reducing the number of statistically significant results found in the correlation analysis in Chapter Five. Twenty four respondents were adequate for the analysis of the subcultures, as sufficient numbers of each of the three subcultures were isolated from the Q-sort.

However, time and again, correlations of the demographic-subcultural variables with the DSS usage statements only bordered on the statistically significant level, even though that level was set at only 0.1. Thus, much of the analysis in Chapter Five remains speculative, with the tantalizing results fairly calling for more research.

There were, of course, practical reasons for limiting the number of respondents. Because of the exploratory nature of the study, it was important to limit both the number of organizations and the number of functional areas

examined in order to avoid confounding results. The three functional areas selected represented the heaviest DSS usage, and the twenty four respondents represented a nearly maximum amount available.

Also somewhat tempering the ill effects of small sample size were the extensive interviews with both CDS and the three functional areas, which allowed both the Q-deck statements and the DSS usage statements to be rather sharply directed. In addition, the pilot study proved valuable in refining the statements.

Thus the small sample size proved to be a worthwhile tradeoff. The study was kept to a manageable size, yet the carefully considered questions for the Q-sort allowed for the emergence of three distinct subcultures. Additionally, there were enough significant relationships between subcultures and DSS usage to encourage further study.

#### Lack of Generalizability

The study centers on only one company. Therefore, it is impossible to state that these three subcultures are likely to appear in every company, and, even if they did, one cannot state that their associations with DSS usage would replicate the results found here.

Once again, this limitation is due to the study's exploratory nature. The primary questions were (a) do subcultures exist, (b) what is the nature of the subcultures, and (c) how are the subcultures associated with DSS usage.

The answer to the first question is an unequivocal yes. While one cannot state that subcultures exist in all organizations, the findings strongly suggest that their existence in other organizations is not unlikely.

The second question can be answered in some detail and with a great deal of certainty for the company. Whether similar kinds of subcultures exist in other organizations is a matter for further research. The nature of the three subcultures found here is intuitively appealing, however, and suggests that similar subcultures could be found in other organizations.

The third question resulted in the least satisfactory answers. The strength of the associations between the independent variables and DSS usage were generally weak. However, subcultures proved to be virtually as good as the demographic/situational variables in explanatory power. The possibility that other studies will find subcultures useful variables in explaining variation of DSS usage is strong.

Finally, the study was limited to association of the independent variables with DSS usage. The possibility that the subcultural variables are useful in explaining other kinds of variation within the organization remains an unsubstantiated possibility.

Thus, once again, limiting the study to one organization proved to be a worthwhile tradeoff. Important questions were answered, and the scope of the project remained manageable.

#### Non-Longitudinality

Because culture is dynamic, the ideal methodology would involve study of the organization over time. The same comment can be made, to a somewhat lesser extent, with regard to DSS usage. The present study is a snapshot of the company, descriptive of the culture as it was at one time. For purposes of dealing with the research questions, a snapshot was deemed adequate. However, a study of organizational subcultures over time would doubtless prove valuable.

### Suggestions for Future Research

This study is largely exploratory in nature, since neither the nature of subcultures has been studied to any great extent, nor the role of subcultures with regard to DSS usage to any extent. Like most studies which break new ground, this study raises more important questions than it answers.

There are three tantalizing questions raised by this study. The first is concerned with implications of the study for developers of decision support systems; the second, with any staff function which deals with large cross sections of the organization; and the third, with the view of strong corporate cultures.

### DSS Development

The first question is, of course, most important for developers of DSS. At the company which was the subject of this investigation, there is a tendency to regard users in one of two fashions: either positively or negatively. Some users, the "white hats," are characterized by willing cooperation with CDS. The second group, the "black hats," were viewed negatively, because they seem to oppose CDS every step of the way.



The study has shown that there are at least three distinct subcultures with which CDS must work. The "loyalists," although harboring generally satisfactory attitudes toward CDS, are not always characterized by high quality of usage.

The "reformers," while not necessarily dissatisfied with CDS, nevertheless are often times aligned with the "anti's" in terms of satisfaction. In particular, although not philosophically opposed to control, the "reformers" object to some of the justification processes. On the other hand, the "reformers" rather consistently outscore the other two subcultures in terms of quality of usage.

The "anti's," of course, are the subculture most dissatisfied with CDS. The dissatisfaction is, however, not uniform across all the statements. The "anti's," for example, are relatively satisfied with Lotus, and also seem to be reasonably satisfied with ICS. And the "anti's" rank somewhere between the "reformers" and "loyalists" in terms of quality of usage.

The distinctive nature of each subculture suggests that the "marketing" of DSS be tailored toward the particularities of each group. It is an axiom in DSS development theory that the involvement of users is

essential. Because DSS usage is much more personal in nature than is MIS usage, it is imperative that model development have user input and that the user interface be satisfactory.

Thus, DSS developers can take advantage of their knowledge of subcultural differences to promote effective DSS usage. For example, members of the "loyalist" subculture might best be persuaded to upgrade quality of usage through appeals to improved company effectiveness, because of their strong identification with company myth, metaphors, and symbols.

The most effective approach to "reformers," on the other hand, is a professional, task-oriented approach. For example, the "reformers" were the only group to prefer a less technical instruction from CDS. With individuals from this subculture, CDS must emphasize how DSS provides more effective means for accomplishing tasks. For "reformers," the user interface is a critical issue.

For the "anti's," the study is most useful for showing more clearly the nature of their dissatisfaction. By carefully considering the satisfaction statements, the sources of dissatisfaction can be identified. Because much of the dissatisfaction stems from the justification process, perhaps CDS could blunt much of the criticism by

reconsidering the current justification procedures.

#### Beyond CDS

Secondly, the study has implications that go beyond CDS. Any staff group which must deal with many segments of the company is very likely to encounter similar variations of these three subcultures. Therefore, it may well be that many areas of the organization, by conducting a similar study, could profit from a better understanding of the subcultures.

#### The Strong Corporate Culture

The third major implication of the study results involves the Deal and Kennedy (1980) approach to corporate culture. The strong culture concept has proven useful as a method for analyzing company subculture. In the case of the study company, the long term best interests of the company may not be fully compatible with the corporate culture.

It is too much to suggest that CDS can play a major role in changing corporate culture. However, as has been suggested, given an understanding of the existing subcultures, CDS is in a better position to work with what is available, tempering the ill effects of competing

subcultures and exploiting the characteristics of the subculture toward more effective DSS usage.

On the other hand, the study results do have implications for top management in terms of building a strong corporate culture. This study has proven useful as an effective and manageable means of analyzing company culture. Using this kind of methodology, executives would be in a position of accurately assessing the status of company culture.

However, understanding the current culture is only the first step in building a more effective organization. Top management is then in a position to compare the actual culture with desired culture. In the case of the company in this study, there are desirable elements extant among all three subcultures.

How to mold these desirable elements into an effective, integrated corporate culture is beyond the scope of this study. One promising approach, advocated by Kilmann (1984), suggests that top management move the organization toward an "adaptive" culture. Kilmann further insists that developing an adaptive culture is only a first necessary step.

Only when the adaptive culture is followed by developing proper management skills for handling the

revamped culture, all work groups infused with the cultural norms, and all work groups structured to fit company strategy will the organization be postured for long term effectiveness. Finally, top management must ensure that the reward system does in fact reward desirable organizational activities.

Once again, Kilmann advocates that it is necessary to incorporate all five of the steps, in the order given. And, once again, the methodology of the study promises to be an effective means of analyzing the current status of the organization's culture.

Thus, a study of organizational subculture, much like the present study, can be used by DSS developers in two ways. First the study can prove to be a useful vehicle to communicate with top management with regard to the status of organizational culture. If the organizational culture proves to be fragmented, then study results are a useful tool to compare the desired culture with the actual culture. Comparing the actual state with the desired state provides the necessary feedback for moving toward the desired state. The study then acts as a control device.

In addition to serving as a communication vehicle with top management, the study analysis also provides

feedback to DSS developers concerning user attitudes. Armed with knowledge of the weak points and strong points of their approach to development, systems personnel can concentrate on revamping specific weak procedures. In the current example, the rejustification process was criticized by many individuals, thus CDS should further analyze means for improving the procedure.

#### Study Conclusions

The research questions have all been answered, to some degree, in the affirmative. The answer to the first question, do subcultures exist within the organization, can be answered positively and emphatically. The results of the factor analysis showed individuals rather easily categorized into one of three meaningful groups, all of which were clustered sharply around three distinct cultural perspectives.

Probably the single most important finding was that the subcultures depart from more traditional groups in their makeup. Previous group research in organizations tended to assume that groups formed because of physical proximity or because individuals within groups were brought together for the accomplishment of some common goal. Subcultures arise, however, because individuals

share common cultural bonds, as revealed in the responses to the statements of myth, metaphor, symbol, and ideology. Most importantly, the subcultures were found to cut across all demographic boundaries--be it functional area, sex, level of hierarchy, or experience.

It has also been demonstrated that the subcultures are useful in understanding variation in DSS usage. While the subcultures were not significantly better than the demographic variable in explaining variation in all cases, they proved to be, in general, at least as good. For some important categories of DSS usage, notably satisfaction with the systems staff, the subcultures proved to be substantially better predictors of variation.

Another major contribution of the study is that it demonstrates the usefulness of the Q-sort methodology in determining the nature of subcultures. MIS is a young discipline, with a need for pursuing a number of methodologies for better understanding. The results of the present study clearly indicate the promising future of further research using the Q-sort methodology.

A final conclusion that can be drawn from the study is the usefulness of culture as an approach to exploring MIS issues. Although the study departs in a number of significant ways from past cultural research, the basic

components of past research--the work with metaphor, myth, and symbol--have been used as a foundation from which a better understanding is built.

In summary, the study has clearly shown the nature of organizational subcultures, and has furthermore demonstrated the usefulness of cultural elements in explaining variation in decision support system usage. The groundwork has been laid for further study in more effective DSS development, more effective staff work, and more effective organizations.



## APPENDIX A

## Q-SORT CULTURE QUESTIONS

1. In the manner of Ghostbusters, the Office Systems Division of CDS has recently posted "tradition buster" symbols throughout their floor. These symbols are good indicators of their increasing responsiveness to the needs of their customers.
2. It is necessary to work here for quite some time before people know the ropes well enough to earn their paychecks.
3. Our division best knows how to handle its business. The less input from senior management, the better.
4. In general, the best way of handling the increased workload in this division is to hire more staff.
5. CDS is helpful because of their ability to serve as consultants in the best way to make use of computer resources.
6. In order to succeed in this company, it is imperative to know, to put it politely, how to "cover your act."
7. The company logo, with its emphasis on character, integrity, helpfulness, and wisdom, summarizes what the company is all about.
8. This company is unique. We must do many things differently from other kinds of companies.

9. The T-shirt parodying the company has done real damage to the company's image.
10. In order to make even a simple change in the way of doing things, it is usually necessary for the suggestions to be reviewed by several different levels of management.
11. There are quite a few people in this division who operate as "lone wolves."
12. The offices in CDS are often decorated with signs expressing the need to be "user friendly," but the people in CDS ignore the signs.
13. Policies to keep desks and walls clutter-free help promote efficiency.
14. In order to succeed here, you need to lower the "walls" that isolate you from other employees.
15. Senior management is usually very supportive of new ways of doing things.
16. What is best for our division may not be best for the company as a whole.
17. The company actively encourages employees to form friendships with other employees.
18. Running this company is similar to running any large retail business.

19. I know of several instances where employees from outside our area completely misunderstood a request, resulting in much confusion and delay.
20. Everything changes very slowly here. The company is much the same as it was years ago.
21. This company is often a leader in the industry in instituting new ways of doing business.
22. People in other areas or divisions understand our way of doing things. We usually do not need to provide a great deal of explanation.
23. In order to cope with the increasing number of demands on our division, we need to develop more efficient methods of accomplishing the work with the same number of people.
24. There are signs located in the stairwells, for example, the picture of a crow inscribed "We want your ideas cause they're worth crowing about." The signs really have little impact on how people think or act.
25. Management attempts to run the company like a smooth running machine.
26. The personal touches in our work area--photographs, posters, slogans, etc.--are desirable in creating a friendly atmosphere.

27. The suggestion boxes located on each floor of the building show that the company is really interested in your ideas.
28. The atmosphere here is pretty relaxed. There is time for comfortable conversation with other employees.
29. Top level officials often oppose changes in well established procedures.
30. There are quite a few influential people here who are surprisingly "wild"; that is, very imaginative in their approach to running the organization.
31. Individuals here are free to come up with new ideas, even to "fire blanks," provided they also "hit the target" often enough.
32. The company's television show has done a good deal to promote a very positive image of the company.
33. The company's logo is outdated.
34. Many of the most influential people in the organization are glorified "bean counters."
35. How other employees dress has little effect on my dealings with them.
36. Some of the usual work procedures don't make sense. However, trying to change the procedure is not worthwhile, because of the time and trouble.

37. The company sometimes hires talented people on a very short term basis. Even though the company knows the person will soon leave, that person can make important contributions.
38. In many ways, this company is like a large family.
39. Newer employees are perfectly free to walk into the office of a division head and ask challenging questions about procedures. They are free to offer face-to-face suggestions about improving those procedures.
40. Work here is fast-paced. For example, people in corridors are usually rushing from one place to the next.
41. The company usually takes a "wait and see" attitude about making changes. That is, changes made in other companies are observed, and only the more successful experiments are implemented here.
42. Our company's corporate culture is in a great state of flux. Things will probably be much different five years from now.
43. People who can "go with the flow" are most likely to get the resources they want to do their job.
44. In order to be successful at your job, it is often necessary to engage in real "dogfights."

45. One of the most important functions of CDS is to "police" the utilization of computer resources.
46. The dress code at the company helps create a favorable impression of the company.
47. When it seems advisable to make changes, senior management supports those changes rather quickly.
48. The company has little real interest in how well employees get along together.

## APPENDIX B

## DSS USAGE

Instructions: Unless otherwise indicated, circle your response to each statement on a scale from -3 to +3, where -3 is "strongly disagree" and +3 is "strongly agree." The zero indicates that you have no opinion one way or the other. DSS here refers to the use of timesharing or micro packages such as Lotus, DBASE-III, or SAS in decision making.

1. I have used a DSS.

YES NO

2. I use DSS frequently.

-3 -2 -1 0 +1 +2 +3

3. One of the most valuable functions of Lotus is its ability to perform "what if" analysis.

-3 -2 -1 0 +1 +2 +3

4. Most of the work we are currently doing with DSS will eventually become standard operating procedure.

-3 -2 -1 0 +1 +2 +3

5. I would prefer instruction from CDS to be less technical.

-3 -2 -1 0 +1 +2 +3

6. I have used DSS in a new, unusual, or creative way.

-3 -2 -1 0 +1 +2 +3

7. A DSS is one of the best means I have for helping the company be more effective.

-3      -2      -1      0      +1      +2      +3

8. It is easier to get results when making requests from Information Center Services (the "Info Center") than from other areas in CDS.

-3      -2      -1      0      +1      +2      +3

9. I have had applications modified to better suit my needs.

-3      -2      -1      0      +1      +2      +3

10. The justification reports for PC's and timesharing cover only tangible benefits; but less tangible benefits are often more important.

-3      -2      -1      0      +1      +2      +3

11. The annual rejustification process is much less important than the initial needs analysis.

-3      -2      -1      0      +1      +2      +3

12. DSS not only works faster, it often improves old ways of doing things.

-3      -2      -1      0      +1      +2      +3

13. Periodic evaluation of DSS usage enables our division to make more effective use of computer resources.

-3      -2      -1      0      +1      +2      +3



14. Info Center consultants often delay me more than help me.

-3      -2      -1      0      +1      +2      +3

15. Users should be allowed to write BASIC programs on the personal computers.

-3      -2      -1      0      +1      +2      +3

16. It is sometimes necessary to be "creative" with justifications for personal computers.

-3      -2      -1      0      +1      +2      +3

17. Sometimes, users have done things with the PC's simply because they were available, not because the output was especially worthwhile.

-3      -2      -1      0      +1      +2      +3

18. Sometimes, the most valuable DSS usage is the most difficult to justify.

-3      -2      -1      0      +1      +2      +3

19. Often, DSS is more valuable for understanding a problem better, rather than producing a specific result.

-3      -2      -1      0      +1      +2      +3

20. The annual justification process provides senior management with information they need to be confident that DSS usage is beneficial to the company.

-3      -2      -1      0      +1      +2      +3

21. When DSS is used to develop a new application, the new method sometimes is found to be appropriate for another problem area.

-3      -2      -1      0      +1      +2      +3

22. We shouldn't have to justify micro or timesharing usage with CDS--individual areas should be responsible for their usage.

-3      -2      -1      0      +1      +2      +3

23. The time saved with DSS is often used in unproductive ways.

-3      -2      -1      0      +1      +2      +3

24. It should be easier to obtain nonapproved PC software.

-3      -2      -1      0      +1      +2      +3

25. Using DSS gives me a much better understanding of the problems or tasks I deal with.

-3      -2      -1      0      +1      +2      +3

26. I am satisfied with the DSS I am using.

-3      -2      -1      0      +1      +2      +3

Answer questions 27-30 by circling the appropriate response.

27. My current area/division is

Investments      Operations      Marketing

28. Sex

Male      Female

29. How long have you been using DSS?
- A. less than 6 months
  - B. 6-12 months
  - C. 1 to 2 years
  - D. more than 2 years
30. Where do you "fit" on an organization chart?
- A. officer
  - B. supervisor
  - C. professional/technical
  - D. clerical

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