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Occupational Cultures of Information Systems Personnel and Managerial Personnel: Potential Conflicts

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Abstract:

Management scholars have articulated the importance of occupational cultures in understanding employee behaviors in organizations. In keeping with this theme, Information Systems (IS) scholars have begun examining the occupational culture of IS personnel. It is generally argued that culture is important because cultural differences lead to conflicts and thus to dysfunctional interactions. A comparison of the occupational cultures of two groups can help identify potential conflicts that could ensue when the members from the two groups interact. In the current study, we interviewed IS personnel and management personnel to identify their respective cultural beliefs along group and grid dimensions proposed in Trice's theoretical framework for characterizing occupational cultures. Based on these interviews, we have analyzed the belief systems of the two groups and highlighted the potential for conflict.

Keywords: Information Systems personnel, managerial personnel, occupational culture, cultural conflicts

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I. INTRODUCTION

The importance of culture has been extensively discussed by scholars in the field of Information Systems (IS) [e.g., Leidner and Kayworth, 2006]. Culture is generally viewed as the set of ideas, beliefs, and values of a group. For example, Kroeber and Parsons [1958, p. 583] define culture as the “transmitted and created content and patterns of values, ideas and other symbolic meaningful systems as factors in the shaping of human behavior and the artifacts produced through the behavior.” Much of the research on culture in Information Systems has focused on national culture (for a review see Myers and Tan, 2002), and some on organizational culture [e.g., Karahanna, Evaristo, and Srite, 2005]. Only recently have scholars turned their attention to IS occupational culture [e.g., Guzman et al., 2004; Guzman, Stam, and Stanton, 2008]. Occupational culture can be understood as the ideas, beliefs, and values that guide the members of the occupation, primarily in their work environment. Guzman and associates [2004, 2008] have characterized the occupational culture of IS personnel along the group and grid dimensions proposed by Trice [1993].

The importance of occupational culture stems from the argument that in an organizational setting, the beliefs, values, and attitudes guiding employee behaviors could be influenced not only by the beliefs and value system of the organization that they are a part of, but may be influenced also by the beliefs and value systems inculcated into them at the national level and by the profession to which they belong [Hofstede, 1984; Karahanna et al., 2005]. In effect, different occupational groups within the same organization could have somewhat different cultural beliefs guiding their behaviors. Differences in cultural beliefs of two interacting groups can lead to friction between the two groups. We define cultural conflict as the friction between interacting groups arising from differences in their respective cultural beliefs. Cultural conflicts are argued to be the root of many dysfunctional aspects of organizations [Leidner and Kayworth, 2006; Guzman et al., 2008] and, possibly, serious consequences. A commonly cited example of cultural differences leading to a disaster is the ill-fated launch of the Challenger shuttle in 1986 [Trice, 1993]. The engineers opposed the launch, and the managers insisted on the launch. At one point, the vice-president of engineering is challenged to think as a manager and not as an engineer. This challenge is an open acknowledgement of cultural differences between the groups, and resultant conflict. The ensuing disaster is one reason why cultural differences need to be understood. A knowledge of occupational cultures will not only help us to understand the behaviors of members of occupational groups, but will also help us to identify potential conflicts that could arise between two groups when they interact.

Trice [1993] proposed a framework based on group and grid dimensions to characterize occupational cultures. We argue that cultural belief systems of two occupational groups can be compared systematically by eliciting the beliefs of the two groups along the dimensions proposed by Trice, and the factors underlying each dimension. Such a comparison will surface potential cultural conflicts between the two groups when they interact. In the current article, we compare the beliefs of IS personnel and managerial personnel and highlight the potential cultural conflicts that could arise between the two groups.

The rest of the article is organized as follows. In Section II, we discuss relevant literature. In Section III, we outline information on methodological issues. In Section IV, we report the results. In Section V, we discuss the results in the context of prior research. In Section VI, we state the contributions and limitations of the study, and in Section VII, we offer concluding remarks.

II. LITERATURE REVIEW

Culture has been studied at multiple levels: national, organizational, and occupational. In the field of IS, the bulk of the research focuses on the effects of national culture, as defined by Hofstede [1984], on a wide range of factors. Studies of occupational culture in an organizational context have used the cultural perspective to understand the interactions of systems developers and users. From the perspective of occupational culture independent of organizations, the topic has received some attention by management scholars in earlier times [for instance, see Schein, 1985] and in recent times by IS scholars [e.g., Guzman et al., 2004, 2008]. The literature review is focused on occupational culture. In particular, we use the framework proposed by Trice [1993] to organize existing literature on IS occupational culture and subculture. The literature related to national culture is not relevant to our research, and, therefore, is not discussed.

Organizational Culture, Occupational Subcultures, and Occupational Culture

The distinction between organizational culture and occupational subculture is clearly explained by Guzman et al. [2008]. Organizational cultures refer to a set of common beliefs and ideologies among members of the organization; these beliefs and ideologies often guide the actions of the members. Initial research in the area of organizational culture assumed a uniform set of beliefs and ideologies among the members of the organization. Subsequent studies have challenged the assumption of a monolithic culture in organizations [e.g., Martin, 1992; Trice, 1993]. In particular, Trice postulated the concept of occupational subcultures in organizations. He argued that different groups within an organization could subscribe to different sets of beliefs and ideologies. In this view, organizational culture is a collection of subcultures (also referred to as *subunit culture*), with the possibility that the subcultures could be in conflict with each other. When the subcultures within an organization were based on the occupations of the different groups, then these subcultures are referred to as occupational subcultures. In effect, the term *occupational subculture* has been used to refer to cultures of occupational groups in the context of a single organization. The term *occupational culture* is used to refer to the common beliefs and ideologies of members of an occupation across organizations. The distinction between occupational subculture and occupational culture depends on the definition of the group whose culture is being examined. When the group is limited to members of an occupation within a single organization, their culture is referred to as *occupational subculture*. When the group constitutes members of a profession belonging to all organizations, their culture is referred to as *occupational culture*. While this distinction is being made for definitional purposes, in practice and in the execution of research, there is a lot of overlap. In particular, it is possible to use a common framework to characterize commonalities of occupational beliefs and ideologies, regardless of whether one is discussing occupational culture or occupational subculture.

Next, we will outline the framework that guides our current study. Then we will discuss relevant studies in IS with a cultural perspective in the context of this framework.

The Dimensions of Occupational Culture

Employees who practice the same profession tend to band together into occupational communities, draw their identities from the work they do, and proceed to share a set of values, norms, and attitudes which form a part of their occupational culture [Van Maanen and Barley, 1984]. Culture at an occupational level contains a “set of taken-for-granted, emotionally charged beliefs, called ideologies” [Trice, 1993, p. 20]. Douglas [1982] proposed a group and grid dimension analysis method (see Table 1), which has been adopted by Trice [1993] to explain aspects of occupational cultures. Trice explains that the forces that comprise the group dimension reflect the cohesiveness of the occupation, while the grid dimension addresses the existence of norms governing the relationships between the group members. Table 1 lists the group and grid dimensions and provides a brief description of each of the dimensions. The reader is referred to Trice [1993] for a more detailed discussion of each dimension.

The works of Douglas [1982] and Trice [1993] provide a framework for studying and characterizing occupational culture. The forces underlying the group dimension help researchers assess the cohesiveness among group members, and the grid dimension elements help the researcher understand the relationships among group members. The framework has generally been used to establish that a group is sufficiently unique and cohesive to warrant being considered an occupation. In our research, we use it as a basis to systematically compare the cultural beliefs of two different occupations.

Studies Incorporating IS Occupational Culture

Studies incorporating IS culture fall into two broad categories: an examination of interactions between IS personnel and users during the Information Systems development (ISD) process and a general characterization of IS occupational culture usually contrasted with cultural aspects of managers. Table 2 provides an overview of salient studies.

Some IS scholars have studied behaviors of IS personnel in organizations from the perspective of IS occupational subculture, without explicitly using the term [e.g., Robey and Markus, 1984; Hirschheim and Newman, 1991; Kendall and Kendall, 1993]. They have viewed the Information Systems development process from the perspective of cultural forms, where cultural forms are viewed as symbols, myths, stories, metaphors and so on [Trice, 1993]. Robey and Markus analyzed the rituals that were a part of the information systems development (ISD) process to argue that ISD process was more political than rational. Hirschheim and Newman enumerated the metaphors, myths, and magic associated with information systems and the ISD process in an organization. They argue that these help in understanding the behaviors of designers and users before, during, and after a project. Kendall and Kendall provide evidence that the ISD process maps to some of the traditional metaphors, such as journey, war, and game, used in the culture literature to characterize interactions. They argue that Information System developers should recognize the users’ metaphor of the process and behave accordingly to achieve success of the project. Bahn’s approach [1995] is primarily conceptual. He focuses on the subculture of systems designers and its role in

the interaction with users. He suggests that the interpretations of key events and stories by the two groups could provide a comparison of their cultural perspectives.

Table 1: Group and Grid Dimension (adapted from Douglas [1982], Trice [1993])

Group Dimensions	Description
Esoteric knowledge	<ul style="list-style-type: none"> • Special knowledge and skills associated with occupation • Special knowledge and skills create feeling of kinship. • Mastery of knowledge needed for acceptance into group • Extended periods in close association acquiring same knowledge contributes to bonding.
Extreme or unusual demands	<ul style="list-style-type: none"> • Level of challenge presented by occupation • Task demands increased occupational involvement [Salaman, 1974]. • The ability to overcome the unusual demands helps group members identify with each other.
Consciousness of kind	<ul style="list-style-type: none"> • Factors which define who is an insider or an outsider
Primary reference group	<ul style="list-style-type: none"> • The group to which occupational members reach out for support • Level of reliance and support from peers
Social image of occupation	<ul style="list-style-type: none"> • Image that members of society would like to project to society • The value of the occupation to society • Pride in the occupation enhances the individual's identification with the occupation and increases cohesiveness
Abundance of cultural form	<ul style="list-style-type: none"> • Include unique language (jargon), rites of passage, occupational heroes, myths, and stories, and so on • Some cultural forms emphasize the separateness or uniqueness of the group, such as jargon and rites of passage. • Others provide bases for pride in the occupation, e.g., occupational heroes. • Symbolic of the group and analogous to a flag around which the members rally and bond together
Pervasiveness	<ul style="list-style-type: none"> • Extent to which their occupation influences the after-work socialization • Common occupation promotes after-work socialization. • After work socialization enhances bonding.
Grid Dimensions	Brief Description
Hierarchical authority, autonomy over work, control over others' works, imposed and formal rules, division of labor	<ul style="list-style-type: none"> • Norms governing the relationships between the members of the group • Hierarchy within the group • The division of labor among group members • Strong grid classification, individual behavior is strongly constrained by hierarchy and division of labor. • Weak grid occupations afford greater flexibility in the behaviors of the members of the occupation.

livari and Abrahamsson [2002] examined specific beliefs of occupations with reference to one approach in systems design. In particular, they were interested in identifying the beliefs with respect to user-centered design (UCD). The groups they examined were UCD specialists, software engineers, and managers. The primary beliefs of interest were the nature of UCD, motivation, criteria for success of a UCD project, and beliefs related to the use of UCD. They found distinct differences across the groups. For instance, managers viewed usability design as theoretical and complicated, but also as a symbolic weapon to improve the image of the software company. Software engineers did not view usability design as important, while UCD specialists considered it important and useful. The study clearly emphasizes the role of occupation in beliefs related to key sets of beliefs, which are part of occupational culture and influence occupational culture.

In each of these, the authors are not attempting to describe or document the culture of the systems developers or the users. Instead, the authors are using cultural perspectives to understand the interactions between systems developers and users. The implicit assumption in these studies is that the meaning of cultural artifacts (also referred to as cultural forms), such as rituals, metaphors, and myths in the organization, must be understood in order to improve the outcome of the Information Systems development process.

In contrast, Schein [1985, 1992, 2004] and Guzman et al. [2004, 2008] examine characteristics of the occupational culture of IS personnel in a more general context. Schein's characterization of IS culture is based on analysis of

Table 2: An Overview of Studies Incorporating IS Culture

Study	Research Area	Specific Approach
Robey and Markus [1984]	ISD process	Analysis of rituals in ISD process
Hirschheim and Newman [1991]	ISD process	Identify metaphors, myths and magic
Kendall and Kendall [1993]	ISD process	Use of metaphors to recommend response
Bahn [1995]	Influence of subcultures	a) Users and IS designers subculture influence on ISD process b) Conceptual study only
Iivari and Abrahamsson [2002]	User centered design	Cultural views of users, systems designers, and managers
Schein [1985]	Characterization of IS culture	Only one issue mentioned (use of jargon)
Schein [1992]	Characterization of IS culture	Beliefs about information, human nature and learning, organization: comparing beliefs of IS personnel and managers
Guzman et al. [2004]	Characterization of culture	Preliminary version of Guzman et al. [2008]
Guzman et al. [2008]	Characterization of culture	IS professional culture discussed in detail Some discussion of managerial beliefs

general observations in organizations. In the 1985 report, he emphasizes the use of technical jargon by IS personnel. In a later work [1992], Schein expands on the assumptions of IS personnel on information, human nature and learning, and organization and management. He shows how some of these are in contrast to the assumptions of senior management in organizations. Guzman et al. [2004, 2008] provide evidence of the existence of a shared occupational culture among IS personnel. They use Trice's framework [Trice, 1993] to show that IS profession could be characterized as having an occupational culture [Guzman et al., 2004, 2008]. Further, they highlight some of the dysfunctions arising from differences in subcultures. The differences lead to stereotyping, confusion about responsibilities, and resistance to changes. In subsequent research, Guzman and Stanton [2009] use the concept of occupational cultural fit to understand the presence of women and minority groups in the field of Information Systems. Their research shows that women and ethnic minorities have a more difficult time fitting into IS culture.

Table 3: Cultural Dimensions Addressed in Salient Studies¹

	1	2	3	4	5	6	7	8	9
Group Dimensions									
Esoteric knowledge							√	√	√
Extreme or unusual demands							√	√	√
Consciousness of kind							√	√	√
Primary reference group							√	√	
Social image of occupation							√	√	
Cultural forms	Rituals	Metaphors; myths	Metaphors	Stories	Jargon		√	√	√
Pervasiveness									√
Grid Dimensions									
Hierarchical authority,						√	√	√	
Division of labor							√	√	
1 Robey and Markus [1984]	4 Bahn et al. [1995]		7 Guzman et al. [2004]						
2 Hirschheim and Newman [1991]	5 Schein [1985]		8 Guzman et al. [2008]						
3 Kendall and Kendall [1993]	6 Schein [1992]		9 Guzman and Stanton [2009]						

Table 3 shows the dimensions of the occupational culture included in various IS studies that adopt a cultural perspective. It is clear that the studies, with the exception of Guzman et al. [2004, 2008], do not examine all the dimensions. Guzman et al. [2004, 2008] include most of the factors in the Trice framework, while Guzman et al. [2009] address selected factors.

A deeper examination of the research indicates that the interest in occupational culture in Information Systems research stems from the need to understand and avoid cultural conflicts between IS professionals and members of other professions. Some researchers argue that a cultural perspective of the Information Systems development process will reduce the likelihood of project failures [Robey and Markus, 1984; Hirschheim and Newman, 1991;

¹ We have not included Iivari and Abrahamsson [2002] because they examined beliefs related to user-centered design, which does not fit with any of Trice's factors.

Kendall and Kendall, 1993]. None of these studies mentions cultural conflict explicitly. Collectively, their recommendations suggest that systems developers should understand the rituals, myths, metaphors (i.e., cultural artifacts) of users and accommodate them in the systems development process. Evidently this will help circumvent potential cultural conflicts. In the same vein, Bahn [1995] suggests that the cultural meanings attributed to events and processes by different groups should be understood to help constructive interactions between the groups.

Other researchers point out differences in cultures which could lead to conflicts and dysfunctions in interactions between IS personnel and managers. The instances of reported differences in cultural beliefs seem almost idiosyncratic, and few overlapping findings are readily identifiable across studies. We list the differences in cultural beliefs identified between IS personnel and managers:

- Managers, systems developers, and user-centered development specialists have a different view of the user-centered development process [Iivari and Abrahamsson, 2002]. This observation overlaps with differences between the views of IS personnel and managers regarding the importance of an activity, as observed by Guzman et al. [2008].
- Differences in cultural interpretation of what is data and what is information by managers and by IS personnel are reported by Schein [1992]. The computer culture (i.e., Information Systems culture) equates the data and information, and the managerial culture sees the two as different. In particular, managerial culture believes that data can be easily handled by technology, but information is more likely to be extracted from the data only by human beings.
- Computer personnel believe that people need to adapt to computers, while managers tend to believe that computer systems need to be designed to accommodate people [Schein, 1992].
- Computer personnel believe that flatter organizational structures are better, while managers believe hierarchy is essential [Schein, 1992].
- Jargon—an artifact of culture—can lead to miscommunication and can thus be the root of conflicts [Schein, 1984; Guzman et al., 2008].
- There are conflicting perceptions of the role of an occupation between IS personnel and managers [Guzman et al., 2008].
- There are conflicting responses to an initiative of one occupational group by IS personnel and managers [Guzman et al., 2008].

Thus, studies to date appear to cite idiosyncratic cultural conflicts as an explanation for observed dysfunctions in interactions. There does not appear to be a systematic effort to identify potential conflicts between two occupations. In the current study, we use Trice's framework [1993] as a basis to surface potential conflicts between IS personnel and managers.

In summary, the literature review brings out some key issues. The study of culture of IS personnel appears to be motivated by a need to understand the dysfunctions that arise as a result of cultural conflicts between IS personnel and other groups that they interact with, primarily users and managers. Published studies have identified specific cultural differences to explain observed dysfunctions in interactions. No systematic study has been conducted to identify potential conflicts that could arise. Guzman and associates [2004, 2008] provide a characterization of the occupational culture of IS personnel using the Trice framework [1993]. They address some cultural conflicts between managers and IS personnel, without developing a full characterization of managerial culture. Thus, there is a need to systematically compare the cultures of IS personnel with the cultures of other groups that IS personnel interact with in order to identify conflicts that could arise.

III. THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

Theoretical Framework

The theoretical framework (group dimension—grid dimension) suggested by Trice [1993] is used to guide the research in this study. The framework has been discussed in the literature review. The group dimension serves to assess the cohesiveness of the overall group and characterizes the group as according to high or low levels of cohesiveness (i.e., strong group dimension or weak group dimension). The grid dimension focuses on group members' beliefs about the hierarchy and division of labor. The group and grid dimensions taken together serve to characterize the cultures of occupations and identify points of potential conflicts.

Research Objectives

Our overall interest is in understanding issues that affect IS personnel. In this case, we wish to examine if the occupational culture perspective can help us understand the potential conflicts that could arise between IS personnel and other groups. Conflicts typically arise when two groups interact. Studies using the cultural perspective of IS personnel have focused on interactions of IS personnel with managers and the generic group of users. The generic group of users do not constitute a single occupational group, so it seemed more appropriate to use managers as the comparison group, since we intended to use a framework developed to characterize occupational cultures. In choosing managers as the comparison group, we also build on existing research, which primarily addresses IS personnel interactions with managers rather than with other specific occupational groups, such as accounting or marketing. Notwithstanding our choice of the comparison group in the current study, comparisons of IS personnel culture to other occupational cultures (such as accounting culture or marketing culture) are equally important and should be pursued.

The research objectives of the current study can be summarized as:

- RQ1. Does the comparison of the cultures of IS personnel and managers indicate the existence of two separate occupational cultures?
- RQ2. Does the comparison of the occupational cultures of IS personnel and managers using the Trice [1993] framework help identify potential points of conflict?

Data Gathering and Analysis

We collected data using semi-structured interviews lasting between thirty to seventy minutes each. The questions being posed to each respondent are essentially the same. Some respondents provide long verbose answers, with potential for follow-up questions; others are brief and limited in their responses. The interview protocols were based on the various forces along the group and grid dimensions of occupational culture as discussed by Trice [1993]. The topics covered in the interview protocol are shown in Appendices A and B. Subjects interviewed were currently working or had experience as IS professionals or non-IS managers in North American organizations. Sample included ten IS personnel (eight men, two women, age range: twenty-four to fifty-four, experience range: one to twenty-eight years) and eleven managers (six men, five women, age range: twenty-four to fifty-nine, experience range one to thirty years). Typical job titles of IS personnel included systems architect, systems analyst, software development team lead, Web services developer, and software architect. The IS personnel in our sample had worked in diverse organizations, including public universities, an insurance company, government establishments, and an information services company. Typical job titles of managers included comptroller, director of hiring, director of financial operations, engineering manager, and assistant manager. Managers in our sample had worked in various organizations, including a government establishment, accounting organizations, a telecommunication company, a large Information Technology (IT) equipment manufacturing organization, a real estate organization, and an investment management organization. Most respondents were enrolled in graduate programs at a large U.S. university at the time of the study. Since our focus is on occupational culture, we used a pool of participants from different organizations rather than one organization. Thus, observations related to the IS personnel group or the management group are attributable to the occupation rather than any single organization.

The interviews were transcribed and the identifying information removed and analyzed. The transcripts were coded according to the codes shown in Appendix C. The codes are derived from a theoretical basis, i.e., the factors or forces that comprise the group and grid dimensions of the Trice framework [1993]. This is in contrast to the practice adopted in studies using grounded theory, in which the codes are generated from the data. When codes are generated from data, it is necessary to demonstrate that there is theoretical saturation, i.e., additional codes are not likely to surface if more respondents are interviewed. In the current study, we start with a theoretical framework to guide our data gathering, and hence the complete set of codes is already defined. It is, of course, worth examining if any new concepts emerge in the data. Examination of the data did not show any new codes surfacing beyond the ones that we started with. This argues that the test of theoretical saturation has been met. Additional support for the sufficiency of data gathering comes from two sources. First, Guest, Bunce, and Johnson [2006] reported that most elements of metathemes (concepts) surface in as few as six interviews, and saturation can occur within twelve interviews. This provides a benchmark to indicate that our sample size can produce robust findings. Second, the characterization of IS occupational culture in our study overlaps significantly with that of Guzman et al. [2008], who interviewed eighty-plus subjects. This affords further support that there is sufficient coverage of the relevant belief domains. In the next section, based on the coding, the beliefs of IS personnel and managers are inferred and compared along the group and grid forces suggested by Trice [1993] to highlight potential conflicts.

IV. RESULTS

In this section, we begin by highlighting the beliefs of IS and managerial personnel along each of the factors (forces) of the group and grid dimensions. The comparison of the beliefs surfaces the differences and the consequent possibility of conflicts. Next, we emphasize the distinctness of the two occupational cultures. Last, we examine the potential conflicts to identify their source and their potential to lead to dysfunctionalities.

A Comparison of Beliefs of IS Personnel and Managers

Group Dimension

The group dimension deals with factors or forces that reflect the cohesiveness of group members of an occupation and help distinguish one occupation from other occupations, i.e., it helps define the cultural identity of the group. Factors that help define the identity include the role of the occupation, the esoteric knowledge, the demands on the profession, the criteria used to evaluate if a person belonged in the group, and so on.

Esoteric knowledge: IS personnel identified the following as tasks unique to their profession: development and maintenance of database systems, server maintenance, Web programming, software design, architecture design, and infrastructure design. They believed that skills in one or more areas, such as programming, database design, software development, networking, and server management are essential for individuals to be part of the IS occupational group. While each of these areas can be highly specialized, nominal knowledge in one or two areas is sufficient to claim membership in the overall group. A systems analyst felt that:

If you understood programming and practiced good programming, then you can [be part of the group].

Managers believed that success in their profession stemmed from two components. The first component included the skills and ability to successfully manage and motivate employees. Managers believed that these skill sets included interpersonal skills, ability to make and communicate decisions, ability to think analytically, ability to conceptualize problems, and leadership skills. Overall, they did not seem to believe that these skills were unique to managers. This is best reflected in the response of one manager:

I don't think that there is one general skill that a manager has which someone, say in the IT department, cannot learn or perform.

The second component related to functional knowledge. They believed that managers should be proficient in the functional domain of the group that they were managing, i.e., accounting managers should be proficient in accounting, engineering managers should be proficient in engineering, and so on.

In addition to the base requirement of technical [functional] competence, I would say the most important was managing relationships, being a people person.

While neither knowledge/skill component is unique to managers, the combination appears to be unique and can be referred to as the esoteric or unique knowledge/skills associated with the managerial profession.

In comparing the two sets of beliefs, the esoteric knowledge of IS personnel is clearly technical, and that of the managers is the unique ability to combine functional competence with the ability to manage human relationships. Overall, the technical focus of the IS personnel and the human focus (also referred to as *people orientation*) of the managerial personnel is evident. This difference may lead to conflict. To provide a hypothetical example, IS personnel and managers may not see eye-to-eye on what kind of IS personnel should be hired in an organization. IS personnel may prefer technical skills to social skills in a prospective IS employee, while managers may emphasize social skills over technical skills. Whether such conflicts arise or not will depend on the extent to which managers get engaged in the decisions related to the Information Systems group.

Extreme or unusual demands: IS respondents believed that they worked in a highly challenging field, and attributed the reason for the challenge to be the pace of change in the area of information technology, and the effort it took to keep pace with the changes. One professional's words were:

It [working in IT] is very fast paced and we have lot more to know. Also, the stuff we got to know is harder.

The challenge of keeping up with technology was welcomed by the IS personnel. One respondent said: "we thrived on challenge," while another expressed the opinion:

If you just want to learn something and do it for the rest of the life and not really have to change much, you don't want to go into IT.

Managers viewed their work as highly challenging and reached out to help newer members and help other managers. The demand in the job stems from having to deal with people and having to be responsible for the organization's well-being and survival, part of which included having to answer to senior managers.

I think it's one of the hardest things to do because you are dealing with people. Certain people are motivated in different ways Certain people do things differently. I think it is very challenging.

But the challenges were more from the personalities involved either both up and down the management structure.

While the work was considered challenging, managers seemed to relish the challenge and believed that the challenge drives them to look forward to managing people every day: "The harder it is the more I like it."

Both groups feel that there are extreme demands on them. IS personnel see the extreme demands and associated challenges arising from the rapid changes in technology, while managers view their extreme demands and associated challenges arising from the idiosyncratic behaviors of the employees that they manage. Both groups enjoy and welcome the challenges presented by their respective professions. It is unlikely that these differences between their beliefs about the sources of extreme demands in their respective professions will lead to a conflict during interactions.

Consciousness of kind: Consciousness of kind refers to the factors that members use to identify whether a person belongs to their occupational group or not. The factors may include the formal qualification necessary, the skills needed, and possibly personality characteristics that are considered a good fit.

IS personnel did not believe any formal qualification was necessary to be a part of the group. One respondent indicated that IS jobs could be done by anyone with a "logical mind set."

If you [have] an IT mind, a logical mind, then you can pretty much do it.

There is also a strong expectation of self-learning. IS personnel believed in waiting for the new employees to prove themselves in this regard and would not try to rescue new employees when they encountered technical problems in their work. One respondent remarked:

I learn[ed] the technical skills myself, either online or from borrowed books.

Managerial consciousness of kind stems more from the role that they play and their position in the organization. They see their role as "cat herders," or "gatekeepers" in the organization. Managers see their responsibility as having to set directions and goals for the workforce and ensure the completion of tasks. As one manager put it,

To unite the workforce in the right direction and get the stuff done.

They also see themselves as the interface between the organization and external entities.

... we are the face of the organization that the people see or the clients see.

Organizational recognition was necessary to become a part of the group, i.e., one earned membership when one was appointed to a managerial rank in an organization.

In terms of membership requirements, IS personnel believed that a logical mind set was enough to enter the profession, and managers believed that becoming a manager involved more than learning the skills associated with managerial tasks. The skill sets required of IS personnel are technical, while those required by managers may be broadly termed as people management. IS personnel believe that an ability to learn on one's own was key to being accepted as a member of their profession. Managers did not express a belief on this issue. However, neither group believed that formal qualifications are essential for inclusion in the group. The beliefs of each group about what makes an individual a member of the group are different in some respects and similar in other respects. While differences exist in the primary beliefs by which each group recognizes an individual as a member of their own group or not, they do not appear to have the potential to lead to conflict.

Reference group: The primary reference group refers to the group that the members of an occupation seek help from. IS personnel relied on each other for advice on solving problems. They believed that the mutual reliance was a result of shared interests in technology and having similar analytical mindsets—to quote one senior network engineer:

... because we share lots of common interest—our interest in technology and computer systems.

They were fairly certain that they would not go to their managers for help. This appears to stem from their belief that IS managers have insufficient technical knowledge.

They [IS managers] just know the kind of technology that needs to be applied. They don't know the inner details of how the technologies work....

Management personnel appear to reach out to two different groups as their primary reference groups. Some managers were very clear that their primary reference group would be their immediate supervisor or manager.

If something was not going well, then the first person who I would go for is my supervisor.

Others viewed their department and peer managers as their primary reference group, with senior managers as a secondary reference group.

Usually to the people in my own department first.... If [the problems] were a higher level, I went directly to my general manager and we worked out the problem.

There is a difference in the reference groups that people of each occupation reach out to. This cultural difference has the potential to lead to conflicts. The managerial culture of reaching out to supervisors to get guidance sets up the expectation that their subordinates in turn will reach out to them for guidance. But culturally, an IS subordinate is unlikely to reach out to his/her manager for guidance, leaving the supervisor possibly offended and maybe uninformed about a problem that may be brewing. The cultural conflict in their respective definitions of reference groups could become problematic.

Image of profession: Under this factor, Trice [1993] primarily addresses the image of the profession as perceived by its own members. From the perspective of identifying potential conflicts, it is useful to look at the image of the profession from the perspective of the other profession also.

IS personnel believed that they play an important role in organizations. They are the people behind the technology, i.e., those who facilitate the processes by which the organization makes sure that information is accurate and retrievable. While all IS respondents viewed their work as important to the organization, there were some conflicting views on whether the IT played a primary or support role. A Web-services specialist felt that IT played a primary role in an organization.

Because when an organization takes IT onto it, the whole organization would be based on how IT field grows inside it.

In contrast, an IS developer said "the technology was a facilitator for change," and thus played a support role.

Management personnel view IT personnel playing a support role:

[IT] is a supporting function that allows the organization to be effective and efficient.

However, managers acknowledge that the support role is critical to the existence and survival of the organization.

[IT] is the backbone of the company.

It is clear that conflicts could surface when IS personnel who see a primary role for IT interact with managers who see a supporting role for IT. The probable nature of this conflict will be that IS personnel would like organizational processes to adapt to the capabilities of IT, while managers are likely to expect IT to design systems that support organizational processes.

In assessing the image of their own group, managers see their responsibility as having to set directions and goals for the workforce and ensure the completion of tasks. As one manager put it,

To unite the workforce in the right direction and get the stuff done.

They also see themselves as the interface between the organization and external entities.

... we are the face of the organization that the people see or the client sees.

IS personnel do not disagree with this role that the managers perceive for themselves. However, IS personnel are critical of most managers. Their criticisms of IS managers and non-IS managers were based on different reasons. They believed that most IS managers lacked technical knowledge and were best suited for managing people, schedules, and budgets, implying that the IS managers had failed to keep up with the advances in technology. IS

personnel believed that IS managers got in the way of doing things. All these beliefs collectively cause IS personnel to distance themselves from IS managers. A senior network security engineer puts it this way:

They need to understand a bit more so that they feel comfortable in engaging employees and the employees feel comfortable engaging them.

Thus, some conflicts between IS personnel and IS managers could surface from their respective beliefs about technical expertise, i.e., IS personnel believing that IS managers are not sufficiently competent technically, and IS managers believing otherwise.

IS personnel view non-IS managers as domain experts. They believed that the functional knowledge of non-IS managers was necessary to better understand the process for which the Information System is being designed. The primary criticism of non-IS managers was that they lacked proper understanding of IT. For instance, they could not judge how easy or difficult it was to write a program or configure a system. Consequently, IS personnel found non-IS managers had inflated expectations of IS personnel, leading to frustration. The level of frustration reflected in the tone of the respondent is stronger than what comes through in these words of the respondent:

... should be able to help all these people, and should be able to get the answers to their questions in seconds, but why is it taking such a long time to do certain projects?.

The frustration of the IS personnel is further reflected in their perceptions of how non-IS managers view IS personnel. They were infuriated by nicknames such as geeks and “cone heads.” They also believed that non-IS managers tend to see them as overly ambitious, geeky, and high maintenance. One respondent reported that their IT team was referred to as “prima donnas—little self absorbed, little egotistical, little demanding and over maintenance.” IS personnel also believe that non-IS managers wrongly portray IS personnel as monopolizing tasks to retain control, without realizing that the tasks were assigned to IS personnel by the non-IS managers.

Thus, some conflicts could surface from the stereotypical images that each group has of the other group. The managerial image that IS personnel are *prima donnas* would bias the managers’ assessment of most statements from IS personnel. For example, reasonable requests for resources could be labeled as unreasonable, thus infuriating IS personnel.

In effect, the differences in the self-images of two professions are not the primary source of cultural conflicts. The differences between the self-image of one group and the image of that group as perceived by another group are more likely to surface conflicts. To summarize, the key differences in their perceptions of the occupations that could lead to conflicts are: (a) the belief of some IS personnel that IT plays a primary role in organizations versus the managerial belief that IT plays a supporting role in organizations, (b) IS personnel belief that IS-managers are technically weak versus the managerial belief that IS-managers are technically competent, (c) the self-perception of IS personnel as normal and reasonable versus the managerial belief that IS personnel are geeky and high maintenance, and lastly (d) IS belief that software is difficult to develop versus the managerial belief that it is just software, how hard could it be?

Cultural forms: In general, the term *cultural form* includes stories, myths, rituals, jargon, and other factors that characterize a group. Stories, rituals, and myths are more a part of organizational groups. In the current discussion of occupational groups independent of organizational affiliation, jargon forms the key cultural form of interest. IS personnel acknowledged that they used technical jargon, but believed that nontechnical persons overstated the extent of use. IS personnel believed that technical jargon was essential to communicate precisely and correctly. In fact, one respondent complained that simplifying technical terms or avoiding jargon for the sake of the user sometimes led to misunderstandings or complications.

Well, it is just a matter of convenience. Sometimes if you had to spell out what everything was the conversation would get long.... Something is lost in the translation when not using the acronyms.

Notwithstanding the self-justification of jargon use by IS personnel, managers believed that the IT jargon was hard to understand and annoying. In this regard, one manager said:

Certainly yes [frequency of jargon usage by IT people] and different jargon from others. It is because their field is growing more rapidly than others. The effect it leaves on us is to make us feel that we are falling behind in terms of knowledge.

Management personnel believe that they use some management-centric jargon among themselves. But they believe that their usage is accepted by non-management personnel and does not make non-management personnel uncomfortable.

Both groups use jargon that is unique to their occupation. However, the use of jargon by IS personnel occasions more complaints. IS personnel view it as necessary and appropriate, while managers view it as excessive and obfuscating. Insofar as jargon is incomprehensible to managers, it can lead to miscommunication and can thus become the source of conflict. Further, there is an implication that IS personnel use jargon as a way of asserting claims to intellectual superiority and specialized knowledge. In such cases, the use of jargon becomes an irritant and could lead to conflicts. Thus, cultural forms of a group, in this case the use of jargon, can become a potential source of conflict.

Pervasiveness: Pervasiveness refers to the extent to which their occupation influences the after-work socialization. At a social level, IS professionals bond through activities such as lunches, parties, and Friday barbecues. The socialization of IS personnel with other members of their occupation outside of work is explained by their mutual interest in technology, and their shared characteristic of being analytical thinkers.

There is a shared interest in technology, shared interest in problem solving and helping each other.

The personal relationship appears to continue even when IS personnel moved to other organizations.

Even after I left the corporations, for six months thereafter, when they needed help, they called on me, and I did answer.

The socialization among managers is used both to strengthen bonds among peers and to acculturate new members. Both these occurred through informal processes, such as observation of other managers and exchange of information over lunches.

[teach belief systems] by letting him observe and by participating in them. We also had social processes that were—taking them out to lunches and dinners.

The interactions among managers outside work were part of the overall socialization among members, which contributed to the bonding. However, more of the bonding appears to come from working together for long hours and having common stakes in the success of projects.

... we helped each other a lot. The consequences of audit failure are significant, and there is a lot of double checking that requires by definition a lot of interaction between the parties.

Both groups socialize outside work, primarily with their own kind. But IS personnel seem to do so because they have common interests in technology, while managers do so to strengthen the bonds of the relationship, which they view as key to their being effective in the organization. The practice of socializing with their own kind enhances the sense of cohesion within each group. At the same time, the social distance between the groups increases, and this could accentuate the issues that form the sources of potential conflict between the groups. The differences in socialization practices are less a source of direct conflict than a lost opportunity to build a bridge between the two groups to enhance the mutual understanding of each other's cultural beliefs.

Grid Dimensions

Hierarchy: IS personnel disliked most forms of supervision, but were willing to concede that some hierarchy is necessary in an organization. As one system analyst explained,

... without some leadership nothing is going to get done there. I think it is important, but at the same time if I am determined to have too much hierarchy in there I am not going to get work done.

Most managers believed in the concept of hierarchy in an organization. They believed that it helped clarify accountability and streamline channels of communication.

Making sure that right person is in the right level.

The concept of hierarchy presents a curious set of conflicts. Internally, IS personnel have conflicting beliefs—they acknowledge the necessity of hierarchy even as they express that they do not like hierarchy. Externally, given the dislike of IS personnel for hierarchy and the belief of managers that hierarchy is essential, it can become a key point of conflict between the two groups.

Division of labor: IS personnel believe that a division of labor based on functional expertise is necessary, but they were willing to be flexible with their contributions to the project. As one respondent put it:

... even though there was a division of labor—that I am the person who is supposed to be designing this, there was also [the understanding] that we are a team and we need to get this done.

Managers believe that division of labor is essential because it helps in structuring the responsibility and defining the workload. Further, they believe that assigning work by function helps the organization by making effective and efficient use of human resources.

It [division of labor] allowed people to succeed, allowed for job satisfaction, allowed for delivering quality product that we felt was superior to the product delivered by our competitor.

Insofar as managers believe that a clear division of labor is necessary for purposes of accountability, while IS personnel believe that some blurring of these divisions may be necessary for effective task completion, there is the potential for conflict.

Relationship to end-users: There are differences in their cultural perceptions of the interactions between IS personnel and end-users. IS personnel almost unanimously believed that end-users are the ultimate customers for whom they were working and for whom they existed. One of the IS respondents said:

... if it wasn't for the users, we wouldn't need any IT personnel.

IS personnel acknowledged the domain expertise of the end-users, but felt that end-users didn't want to play much of a part in IT projects.

I don't think end-users are playing a big role right now. What role they should play is—have a role in systems requirement definitions, GUI [graphical user interface] design and such things. But I don't think the end-users usually get involved.

This is in contrast to the prevalent belief that IS personnel do not take user needs into consideration. IS personnel believed that end-users lacked knowledge of IT and its capabilities, leading to unrealistic expectations. This is reflected in the words of a systems architect:

They [users] view it as, all it is is a piece of software, and, how hard can it be to make?

Another respondent explained that IS personnel believed that end-users perceived IT personnel as a closed group and as control freaks.

Thus, the conflicts in the interactions between IS personnel and end-users are aggravated by the end-user belief that IS personnel don't care about end-users and IS personnel belief that end-users don't want to get involved in providing requirements. Another source of conflict is the cultural perception among end-users that software is easy to develop, which is in contrast to the reality faced by IS personnel.

Management personnel also believe that "the customer is king." Management personnel believe that the end-user should be highly involved in projects, by providing inputs and feedback and by being the voice of the stakeholder.

[The end-users] input should be valued.

[End-users] should have lot of input; otherwise you could be wasting a lot of time and money.

The potential for conflict between IS personnel and managers on the issue of end-users is similar to the conflict between IS personnel and end-users. IS personnel associate the failures in the interactions with users' willingness to devote time to the interaction and their perceptions of what Information Technology can and cannot do, while managers often attribute the failures to IS personnel unwillingness to pay attention to users.

In this section, we have examined the beliefs of IS personnel and managers by individual factors of the group and grid dimensions, and compared the beliefs of the two groups. The structure of the Trice framework helps to ensure that issues are being systematically addressed. However, information about individual factors of a framework provides only points of information and fails to bring out the relationship between the beliefs across factors. So the cohesive picture that a cultural perspective can provide may be lost. In the next sub-section, it will be seen that the beliefs cluster around some key themes. This also provides a comparative picture of the distinctness of the cultures of the two occupations. Subsequently, we look at the patterns that emerge in the potential sources of conflict.

The Distinctness of the Two Cultures

In this sub-section, the differences in beliefs between IS personnel and managers are summarized in Table 4. Then we provide a comparative discussion of the cultures of the two groups to highlight their distinctness.

The distinctions between IS personnel and managerial cultures can be seen by focusing on three themes. The first theme that emerges is that the IS occupational culture is rooted in its connection with technology, while the managerial culture is rooted in managing the human component of the organization to achieve corporate goals, i.e., managerial culture is people oriented. The second theme centers around the relationships that each group has with each other, its peers, and its customers. The third theme relates to the preferences along the grid dimension.

Table 4: Comparison of Beliefs of IS Personnel and Managers

Group Dimensions	Beliefs of IS Personnel	Beliefs of Managers
Esoteric knowledge	Unique skills required, but logical mind enough to start	Need both functional and interpersonal expertise, emphasis on latter
Extreme or unusual demands	Arises from dynamic nature of IT	Arises from managing people
Consciousness of kind	Derive their identity from role of IT in organization	Identity from the belief that they are in charge of the organization and that they are the face of organization
Primary reference group	IS peers (not IS managers)	Both peers and supervisors
Social image of occupation	Social image derived from positive contributions of technology to society	Social image derived from positive contributions by maximizing utility of resources
Abundance of cultural forms	Need IS jargon to communicate effectively	Need managerial jargon to communicate effectively; find IS jargon confusing
Pervasiveness	Socialization motivated by mutual interest in technology	Socialization motivated by need to mentor and be supportive of each other
Grid Dimensions		
Division of labor	Necessary, but flexible	More rigid division of labor to clarify accountability
Hierarchy	Flatter structure preferred, but see the need for some hierarchy	Some say flatter structure good, but most want clarity about who reports to whom.
Relationship to end-user (customer)	End-users are important; but end-users have limited knowledge of IT and limited interest in IT projects.	Customers are important. IS personnel need to pay attention to user needs.

The beliefs of the IS personnel reflect a group whose identity is tied up with technology. IS personnel must know technology and understand the demands created by the rapid advances in technology, one of which is that members of the group must have the ability to learn on their own. They believe that regardless of whether the role of IT is viewed as a primary role or a support role, technology has a very important role in the organization. Technology can make or break a company. The value of technology to the organization is the basis of society's assessment of the importance of IS personnel. In contrast, managerial culture is rooted in the need to take individuals with differing beliefs and goals, and have them work cohesively to achieve common goals. This aspect of management activity can be thought of as unchanging at a high level, but nonetheless is a very challenging part of the managerial work. Managers believe that new group members have to be acculturated into the profession with mentoring and other forms of guidance. They also believe that they are the face of the organization, and thus their performance is key to the success of the organization. Societal assessment of the occupation is based on the role of leadership role of managers in organizations.

The relationships of the two groups to each other, their peers, and their customers also vary. IS professionals viewed IS managers as lacking in technical knowledge and capable of only managing schedules and budgets. In contrast, non-IS managers viewed IS managers as having knowledge of both technical and managerial skills. IS professionals viewed their peers as the primary reference group: they believed that the peers were likely to be more knowledgeable about technology. Managers leaned toward keeping their supervisors in the loop trusting the experience of supervisors to guide them. Both IS personnel and management personnel recognize the importance and role that end-users (customers) play in projects. Both groups believed that end-users should be involved in projects, but IS personnel are more critical of end-user understanding of the capability of the technology and the capabilities of IS personnel.

IS professionals believed in more fluid structures and division of labor, presumably based on the argument that these enabled a focus on completing tasks. Managers, on the other hand, favored structures and division of labor to clearly demarcate responsibility and accountability. IS professionals acknowledged the need for some hierarchy but leaned toward a flatter organizational structure. Managers believed in a more rigid hierarchical organization. IS personnel believed that division of labor was necessary because of differences in skill base, but were willing to be flexible in the duties they performed to meet team goals. Managers believed in a clearer division of labor than IS

professionals. The differences in the belief sets are clear. Traditionally, the number of years of experience that managers had equated to knowledge and expertise. IS personnel, because of the rapid changes in technology accord less value to years of experience. Further, the complex interdependent nature of some technical projects makes clear division of labor more difficult. Managers, on the other hand, appear to continue to be guided by the traditional reliance on hierarchy and division of labor to enforce accountability.

The discussion in this sub-section addresses the first research question (RQ1), i.e., is there evidence of two separate cultures? The differences between the cultural beliefs of the IS personnel and managerial personnel can be readily seen, supporting the existence of the two cultures. Further, one can detect signs of the cultural tension between the two groups. In the next sub-section, we look at the potential conflicts that could arise in interactions between IS personnel and managers.

Sources of Potential Conflicts

In Table 5, the possibility of conflicts as a result of differences in beliefs across IS personnel and managers along individual factors are listed. This is followed by a discussion of the different sources of cultural conflicts.

In attempting to identify cultural conflicts, it is worth keeping some issues in mind. First, conflict can be internal or external to the group. Internal conflict arises when a group has a set of values or beliefs about one issue that are at odds with the values or beliefs of the same group on another issue. External conflict arises when one group has a set of beliefs that are at odds with the beliefs or values of a group with whom they have to interact. Second, differences in beliefs across the group have varying potential for conflicts.

IS personnel appear to have more internal conflicts in their beliefs than managerial personnel. Four internal conflicts surfaced in our observations.

1. Some IS personnel view IT as having a primary role in organizations, while others view IT as having a support role.
2. IS personnel are aware that they use jargon which is difficult for the nontechnical person to understand, but they insist that the use is necessary to communicate precisely.
3. IS personnel complain about the lack of end-user input into IT related issues, but at the same time they express a lack of confidence in the users' knowledge of IT related issues.
4. They want a flatter organization, while simultaneously acknowledging the need for a hierarchy.

Some of these conflicts can lead to greater dysfunctions than others. For instance, jargon may help precise expression of ideas, but jargon does not help overall communication if the users do not understand it. Thus, this internal conflict shifts the burden of coping with IS jargon on to the users, which may not come about, leaving the communication dysfunctions unresolved. Similarly, user input is needed, but such user input as is offered may be discounted because *per se* IS personnel believe that the users do not fully understand the limits of IT and the processes to develop IS solutions. Thus, the dysfunctions associated with user input may persist either because the users do not provide input or, when they provide it, the IS personnel may discount it. In contrast, other internal conflicts may lead to less or no dysfunction. For instance, some IS personnel may desire a flatter organization, while others acknowledge a need for hierarchy, and some may view IT as having a primary role while others view it as having a support role. In both cases, the internal conflict (as opposed to the external conflict with managerial views) within the IS group should not lead to serious dysfunctions.

Managers, on the other hand, appear to have fewer internal conflicts. The only conflict that is observed in the current study is that there is a strong belief in the need for hierarchy, but there is also some acknowledgement of the need for a flatter organization. This internal conflict does not have much potential for dysfunction.

In the case of differences in beliefs between the two professions, i.e., external conflicts, differences have a varying potential for leading to conflict than others. Differences that have a lower potential for conflict originate in the beliefs of the two groups along these dimensions: extreme or unusual demands and pervasiveness. Each group has its own beliefs about the sources of extreme or unusual demands. The beliefs of each group along this dimension exist independent of the other group's beliefs and do not affect expectations from the other group. Hence, there is little likelihood of conflict from this. In the case of pervasiveness, i.e., the after-work socialization routines, the separate orbits do not produce conflicts but do lead to foregoing the opportunity to understand each other's cultures.

Table 5: Summary of Potential Conflicts

Group Dimensions	Potential Conflict	Contingency (if any)
Esoteric knowledge	The technology focus of the IS personnel vs. the human focus of the managers	If (general) managers impose their values on IS decisions
Extreme or unusual	Not likely to result in conflict	
Consciousness of	Not likely to lead to conflict	
Primary reference group	IS rely on peers; managers rely on supervisors. IS personnel may not seek help from managers, while managers may wish to know what is going on, when there is trouble.	
Social image of occupation	Some IS personnel believe IT has central role; managers believe that IT has support role. This may lead to issues about how IS should formulate solutions—should organizational processes adapt to IT capabilities or should IT design to support existing processes? Differences in beliefs about IS can and cannot do—managers may have unrealistic expectations of what IT can do and how fast.	When interaction is between IS personnel who believe in the centrality of IT and managerial personnel who believe in the support role of IT.
Abundance of cultural forms	IS jargon in particular can be a bone of contention—IS personnel argue they use it for precision in communication; managers feel that IS personnel use it to obfuscate.	
Pervasiveness	Missed opportunity for bonding between two groups. Each group tends to socialize with their own kind.	
Grid Dimensions	Potential Conflict	Contingency (if any)
Hierarchy	Flatter structure preferred by some IS personnel, while managers want clear hierarchy. Frequent source of friction.	
Division of labor	IS personnel want flexible assignments, while managers would like clear division of labor.	
Relationship to end-user (customer)	Differences in why problems exist in interactions between IS personnel and managers.	

The second set of differences is likely to produce conflict, depending on situational issues. These are differences along the dimensions of esoteric knowledge, consciousness of kind, and the primary reference group. In each case, the organizational norm of how much general managers intrude into the activities and management of the IS group will determine if conflicts surface. The esoteric knowledge of IS personnel is more technical, and that of the managers is more social or people-oriented, and these, in turn, will influence their perspective of approaches to running an organization. IS personnel may place more value on technical competence in their employees, and better technical performance from the equipment that they recommend for purchase. In contrast, if managers are involved in that decision, they may prefer IS employees with better social skills and equipment that is less expensive. The conflict will surface only if managers are part of the decision-making processes on these issues; otherwise, there should be no conflict. Similarly, with respect to consciousness of kind—one of the key issues is how new employees should be acculturated. IS personnel believe that employees have to pull themselves up by their bootstraps; managers tend to mentor. This difference should cause no conflict, unless management insists that IS personnel adopt the more nurturing attitude implicit in a formal mentoring program. Lastly, along the dimension of the primary reference group—IS personnel consult their peers for help, but managers are more likely to seek the help of their supervisors. Thus, managers supervising or interacting with IS personnel may be unhappy about not being made aware of or consulted on problems by IS personnel, because the IS personnel behaviors would violate the cultural expectations of managers. The three dimensions discussed here will result in conflict only if general managers choose to get involved in the decisions related to the IT department. In some organizations, the IT departments may function with only high-level oversight from managers, in which case there should be little conflict.

The last set of differences has the highest likelihood of leading to conflicts. These differences are along the following dimensions: image of occupation, cultural forms, hierarchy, and division of labor. The images of occupations can be viewed either as self-images or the image of one occupation by members of another occupation. The differences between the self-image of one occupation and the image of that occupation by the other occupation are usually problematic. For instance, some IS personnel view their occupation as having a primary role in the organization (vs. a supporting role), while most managers view IT as having a supporting role. This difference can easily be seen to be a point of conflict in IT-related decisions, and the importance of IS personnel in the key executive decisions. Similarly, the beliefs of IS personnel that most managers are technically naïve clashes with the managerial self-

image of an intelligent, competent group. This difference may lead to the reluctance of IS personnel to accept decisions by managers regarding IT.

The group factor, cultural forms, includes rituals, myths, and jargon. Jargon is a component of communication. Thus, the conflict between the belief that IS personnel computer jargon is essential for unambiguous communication and the managerial belief that computer jargon is incomprehensible can lead to much friction and dysfunctions. The difference in the beliefs about hierarchy is that IS personnel prefer a flatter organization, while managers prefer a clearly hierarchical structure. This difference is likely to be a source of continuing friction in the day-to-day interactions with managers trying to assert their authority and IS personnel trying to assert their independence. Similarly, the differences in the beliefs of the two occupations about division of labor is likely to be an ongoing tussle with each group trying to assert its viewpoint. The issue of whether the conflicts arising from the differences in beliefs about hierarchy and division of labor reach a point of dysfunction will depend on the individuals involved in these interactions.

In this sub-section, there is information to address second research question (RQ2), i.e., does a comparison of the two cultures using Trice's framework help to surface potential conflicts between the two groups? The comparison has helped identify several conflicts, both internal and external, and helped assess the likelihood of dysfunctions arising from the conflicts.

In the results section, the individual points of observations from the current study have been reported and then viewed holistically to answer the research questions. In the next section, the results from the current study are viewed in the context of previous studies.

V. DISCUSSION

In this section, we discuss our findings in the context of prior literature. First, we compare our findings about the culture of IS personnel with those of Guzman et al. [2008], who used the same framework to characterize the occupational culture of IS personnel. Second, we provide a descriptive comparison of our findings about managerial culture with earlier findings. Third, we compare the potential conflicts between IS personnel and managers identified in the current study with those identified in earlier studies.

IS Personnel Culture

Table 6 provides a summary comparison between Guzman et al.'s [2008] work and our work along each group and grid dimension. Similar to Guzman et al. [2004, 2008], we have shown that IS personnel had esoteric knowledge, used jargon, had complaints about the end-users, and so on. We have extended Guzman et al.'s findings along some of the group factors. For instance, Guzman et al.'s findings indicated that technical jargon led to confusion, while our IS respondents argued that simplification of technical jargon could lead to misunderstandings. Also, we add some new perspectives on issues not mentioned by them. Among the new perspectives that we have addressed are the source of the IS personnel's identity and the relationships to peers among IS managers and non-IS managers. The identity of the IS personnel is rooted in their relationship to technology. The respondents were unappreciative of IS managers, who were seen to be lacking in technical knowledge. Further, the IS personnel believed that both non-IS managers and end-users had unrealistic expectations in terms of what software could do and how quickly things could be done.

The comparison of our findings with that of Guzman et al. [2008] reinforce Trice's contention that identifying occupational culture is a complex phenomenon, and it may take a series of studies to fully understand the occupational culture of IS personnel [Trice, 1993]. The current study has identified characteristics that were not reported in the Guzman et al. [2008] study, and there are characteristics that they have reported which did not surface in our study. Taken together, the results from the two studies provide a more comprehensive view of the IS occupational culture. Further studies have the potential to enrich our understanding further.

Managerial Personnel Culture

In the current study, managers express the belief that they are captains of the organizational ship, implying that only managers have the authority to perform certain tasks. This resonates with reports by earlier researchers [e.g., Trice, 1993] who found that managers believed that "*only* [our italics] management possesses the right to decide how to organize work ..." (p. 150). In the current study, the people-orientation of managerial culture comes through clearly, i.e., managers need to motivate people with diverse characteristics to accomplish organizational goals. This is consistent with Watson's summary [1994] of the views of scholars and writers that management is "the art of getting things done through people" (p. 42). Given the perception of their role as those in charge of an organization, they need to get things done through people; this, in turn, appears to lead to their beliefs about the need for hierarchy and division of labor. The division of labor helps identify accountability, and hierarchy specifies who individuals are

accountable to. Their acceptance of the notion that employees reside at different levels of an organization also correlates to their relationships to others in the organization. They are more respectful of their supervisors and do believe them to be capable of helping with problems. Their peers, including IS managers, are also viewed respectfully, both for their knowledge of their respective domains, and for their ability to play effective roles in projects. Subordinates are viewed as users, i.e., individuals who have needs that have to be met to help them do their jobs effectively. Trice [1993] in his discussion of managerial cultures cites many scholars to emphasize that hierarchy and division of labor have characterized managerial thinking for many decades and continue to do so in current times. He also points out that early organizations were run by owner-entrepreneurs who were indeed the “face of the organization.” This view appears to have carried over to managers in present-day corporations, even though most managers do not fall into the owner-entrepreneur category. Watson [1994], in an extensive examination of managers, found that managers believed that they were more dedicated to their work than other employees. He also reports that managers expressed a desire for control, which is consistent with the findings in our study that managers believed in hierarchy and clear division of labor. Other forces in the group and grid dimension do not appear to have received much attention in earlier research for the managerial culture.

Table 6: Comparison of Findings of Guzman et al. [2008] and Current Study

Group Dimensions	Guzman et al. [2008]	Current Study	Additional Contributions/Differences of Current Study
Esoteric knowledge	X*	X	Tasks/skills IS personnel qualified to perform were identified.
Extreme or unusual demands	X	X	None
Consciousness of kind	n/a**	X	Specifics about how IS personnel identity was derived from various sources is reported.
Primary reference group	X	X	Reasons for using IS peers as reference group rather than IS managers stated
Social image of occupation	n/a	X	Social image derived from positive contributions of technology to society
Abundance of cultural forms	X	X	Miscommunications from use of jargon [Guzman et al.] vs. miscommunications from NOT using jargon (current study)
Pervasiveness	n/a ²	X	Social interaction outside work motivated by common interest in technology
Additional beliefs related to group dimension			
Beliefs about IS managers	n/a	X	Belief that IS managers do not have sufficient technical knowledge
Beliefs about non-IS managers	n/a	X	Belief that non-IS managers have unrealistic expectations of IS personnel
Beliefs about end-users	X	X	None.
Grid Dimensions			
Division of labor; Hierarchy	X	X	Need for division of labor, but maintain flexibility; like flat structure, but recognize need for supervisors
<i>X—Evidence for the existence of the dimension. n/a—details not available</i>			

Previous studies of managerial culture place a greater emphasis on the grid dimensions of managerial beliefs. In the current study, we have addressed the group dimension which pertain to the cohesive forces of managerial culture. We have reported managerial beliefs about: their esoteric knowledge, the unusual demands of their profession, the consciousness of their kind and other factors. All these beliefs reflect the forces that bind managers into a culturally distinct group, with a strong people-oriented perspective.

Potential Conflicts

In very broad terms, the roots of conflict between IS personnel and managers can be argued to be (a) the technology-centric culture of IS personnel versus the people-centric culture of managers, and (b) the long-embedded traditions of management versus the comparatively recent origins of the Information Systems field. In the current study, there are instances of potential conflicts rooted in each of these. The potential conflicts arising from the technical orientation of IS personnel include the centrality of IT in organizations (primary or support role of IT), the need for technical versus social skills in IS employees, and the use of jargon. Prior research has clearly identified some of these. For instance, the issues arising out of technical jargon are mentioned by Schein [1984] and

² Subsequently, Guzman and Stanton [2009] have studied the pervasiveness dimension.

Guzman et al. [2008]. Other issues are mentioned peripherally. The current study surfaced the differences in the centrality of IT in organizations. Guzman et al. [2008] viewed a similar point as differences in perceptions about the role of IT. More issues could surface from the technical versus human perspective. We have mentioned a possible conflict on the issue of what skills are most appropriate for an IS employee. Schein [1992] reports another perspective: the IS belief that users should adapt to computers while managers believe that computers should accommodate to users. It is unclear whether this view still persists among IS personnel. In the current study, the respondents were fairly definite in their statements about the need for IT to meet user and organizational requirements. However, this change in IS personnel thinking has not been recognized by managers. Managers appear to continue to hold IS personnel responsible for conflicts with users, based presumably on previously held beliefs. IS personnel feel users are not playing their role in the development process.

At a more general level, Trice [1993] discusses the generic issue of cultural conflicts between technical groups (i.e., those with expert knowledge in a domain, e.g., scientists, lawyers, physicians, accountants, engineers, and so on), and managerial personnel. He indicates that there is an ongoing tension between the expert groups and managerial group, with the power base shifting back and forth. The cultural tension between IS personnel and managers can be viewed as being similar to the tension between other expert groups and managers.

The long traditions of management culture have hierarchy and division of labor strongly embedded in them. Trice [1993] cites Weber [1947] as including both hierarchy and division of labor as key factors of the administrative (managerial) subculture. Schein [1992] observed the difference in the beliefs about flexible work assignments, and they appear to be true even today. The fast-changing nature of information technology reduces the value of experience, presenting a strong challenge to the idea of hierarchical authority. It also demands flexibility in assignments. The two sets of beliefs inevitably clash. While there is recognition in modern management that the fast-changing nature of information technology requires managers to reconsider these beliefs, cultural beliefs are still slow to change, and the potential for conflicts persists.

In the current study, we observe additional points of potential conflict. For instance, the reliance of IS personnel on peers for help may lead to conflicts with managers who may expect to be kept abreast of problems and may want an opportunity to influence the solution paths. Further, IS personnel expect new members in their group to be self-learners and prove themselves, which could be considered a ritual of passage. Managers, on the other hand, appear to have a tradition of mentoring newcomers to their group.

It is also worth observing that differences between the beliefs that one group holds about itself when contrasted with beliefs that the other group holds about the first group can also help surface potential conflicts. For instance, IS belief that managers have unrealistic expectations from information technology conflicts with managerial beliefs that IS personnel use technical jargon to obfuscate. Thus, in addition to comparing the respective beliefs of the two groups about themselves, it is beneficial to compare the beliefs of each group about the other group.

Lastly, there are three other general issues worthy of note. First, there may be internal cultural conflicts in a group. In the current study, IS personnel display more internal conflicts than managerial personnel. Examples of internal conflict have been discussed in earlier studies [e.g., Leidner and Kayworth, 2006]. Second, cultural differences should not be equated with cultural conflicts. A difference becomes a conflict only when the two groups have to negotiate that difference during an interaction or when one group tries to impose its viewpoint on the other group. Third, the methodology used in this study could be used to examine potential cultural conflicts between any two interacting occupations.

Implications of Cultural Conflicts

When two groups have different cultural beliefs and they have to interact, the likelihood of cultural conflict exists. The implications of such conflict will depend on the processes adopted to resolve the differences in beliefs. Constructive resolution will avoid negative outcomes. But constructive resolution may be difficult to achieve. Cultural beliefs are deeply ingrained and are not easily surrendered or compromised. Thus, the conflicts and the associated dysfunctions tend to persist over time. These can be seen in some of the debates that have been continuing for several decades. These include issues such as the use of jargon by IS personnel, whether computers should be designed to accommodate humans or humans should adapt to computers, whether IT has a central or a supporting role in organizations, and so on. Even when changes occur, such as current beliefs among IS circles that systems have to be designed to meet user needs, other groups such as managers may fail to notice the change. Managerial cultural beliefs about IS are deep rooted and are not easily updated. In effect, the major implication is that cultural conflicts are persistent and are difficult to eradicate. Organizations have to make a conscious effort to identify and address cultural conflicts to avoid the dysfunctions that may otherwise follow.

VI. CONTRIBUTIONS AND LIMITATIONS

Contributions

The importance of culture is often mentioned by IS researchers. However, insufficient attention has been paid to the area of occupational culture and the conflicts that could arise as a result of differences in occupational cultures. Examination of cultural conflicts has been limited to idiosyncratic studies that attribute conflicts in the interactions of IS personnel with managers or users to differences in cultures. In the current study, we follow a systematic process using Trice's framework to identify potential conflicts between IS personnel and managers. In addition to identification of potential conflicts following Trice's framework, we also add to the body of knowledge regarding occupational cultures of IS personnel and managerial personnel.

The findings of the study about potential conflicts can be viewed at different levels. At a high level, several issues surface. First, the study confirms our expectation that a systematic examination of the differences in cultural beliefs of two groups using Trice's framework does surface potential conflicts. No prior research has used this systematic process to identify potential conflicts. Second, cultural differences are not by themselves problematic. Conflicts surface only when the differences have to be resolved in the interactions between two groups. Third, it is worthwhile examining internal inconsistencies in the beliefs of a group.

At an intermediate level, two issues are worthy of note. The conflicts between IS personnel and managers appear to be rooted in two primary factors: the technical view of IS personnel versus people-oriented perspective of the managers and the more recent origin of IS culture versus the longer, more deep-rooted culture of managers. Further, the differences between self-images of occupational groups and the perceptions of other groups of the occupation seem to give rise to conflicts.

At a more detailed level, specific instances of conflict or potential conflict have been identified. Some of these conflicts have been mentioned by earlier researchers. For instance, the use of technical jargon by IS personnel have been long known to lead to misunderstandings and conflict. Other instances of potential conflict have not been reported earlier. For instance, the differences in the choice of reference groups may lead to differing expectations of behaviors and may lead to conflicts. The specific instances of potential conflict have been discussed in depth in earlier sections and will not be repeated here.

Additionally, there are contributions to the body of knowledge about IS occupational culture. In the current study, aspects of the occupational culture of IS personnel along the group and grid dimensions as proposed by Trice [1993] have been identified. Guzman et al. [2008] have also reported results along the same lines. While the two studies have used the same framework, the sets of questions that were used are different. Thus, our study triangulates on the questions. The similarities between the characterization of IS occupational cultures in the two studies despite different interview questions adds credibility to the cultural characteristics that have surfaced. Some additional beliefs were raised in our study. Among the new perspectives that we have surfaced are the technical root of IS personnel's identity, and the relationships of IS personnel to peers, IS managers, and non-IS managers.

With respect to managerial culture, we have examined the beliefs of managerial personnel along the group and grid dimensions. While aspects of managerial culture have been reported elsewhere [e.g., Trice, 1993; Watson, 1994], we have not seen a systematic examination of managerial culture along the group and grid dimensions in literature so far. It is interesting to note that some of the key beliefs in managerial culture persist from a long time ago. For instance, their belief that they represent the face of the organization has existed since the days of owner-entrepreneur, as well as their perceptions of hierarchy and division of labor. The beliefs about individual group level factors that form the core of their identity have been surfaced.

In sum, the systematic examination of occupational cultures serves to enrich our understanding of occupational cultures, and the comparison of the cultures of two interacting occupations helps to identify potential conflicts.

Limitations and Further Research

The development of knowledge in an area is a cumulative process. We see potential for further research based on the limitations of the current study. First, Trice [1993] states that it is difficult to classify and identify ideologies associated with an occupation, since there are a wide variety of possible sets of beliefs. Hence, any attempt to identify relevant beliefs and values will necessarily need a series of studies, each building on the other. Thus, the field has to remain open to the possibility that further replications and triangulations are necessary to gain a deeper understanding of the occupational culture of IS personnel and potential conflicts. Second, interviews as a mode of data collection are very resource intensive, in terms of money and/or time. Thus, only limited data can be gathered in qualitative studies based on interviews. Confirmation of results using a large-scale survey will add to the credibility of the results that we have reported. Third, in our study, the subjects have relevant experience in the occupation and

are qualified to provide an inside view of the occupation. Our results are not dissimilar to those of Guzman et al. [2008]. Hence, we feel confident that our results will stand up to further scrutiny. A replication of our study with a larger pool of subjects recruited from diverse corporate environments would be meaningful. Lastly, our respondents were from North America. Examination of cross-national differences in IS occupational culture would add further insights to our understanding.

VII. CONCLUDING REMARKS

Differences in cultural perspectives are often the source of conflicts between interacting groups. In the current study, we have conducted a systematic comparison of the occupational cultures of IS personnel and managers using Trice's framework. The comparison shows that some differences between cultural beliefs of the two groups have a high likelihood of leading to conflict, other differences may lead to conflict depending on the context, and still others are not likely to lead to conflict. Cultural conflicts are difficult to resolve because of the ingrained nature of such beliefs. Yet, with the key role that information technology plays in the success of organizations, it is imperative that cultural conflicts between IS personnel and managers be minimized. Both IS personnel and managers need to understand their own respective cultures and the culture of the other groups to find a mutually acceptable region of comfort where they can cooperate to the organization's benefit. We have built on earlier work by others, in particular Guzman et al. [2008] to advance the understanding of the IS occupational and managerial cultures, and the conflicts that could arise from differences between the two cultures. There is scope for further advancing the field's understanding of occupational cultures and for surfacing potential conflicts. These will provide a foundation of knowledge for the most important challenge of all—to identify practical ways in which to manage these conflicts to improve organizational effectiveness.

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APPENDIX A: TOPICS COVERED IN INTERVIEWS OF IS PERSONNEL ³

- Age, ethnicity, education, professional certifications
- Current employment, past employment: title, number of years, job responsibilities
- The understanding Information Systems (IS) personnel of the term *culture*.
- The relationship of IS personnel with members of their occupation, their sense of belonging and camaraderie
- The reference group or IS personnel, i.e., Whom do they go to for help on work-related problems?
- Tasks and responsibilities of members of their occupation
- Qualifications required to perform tasks
- Managerial guidance and control on tasks
- Skills required to be an Information Systems personnel—both Information technology (IT) skills and non-IT skills
- Who assesses the qualifications of the IS personnel?
- Beliefs:
 - beliefs about the role of technology (Does it play leading role or supporting role?)
 - beliefs about role of IT personnel in the organization
 - beliefs about the division of labor among the IT personnel (Who should do what job?)
 - beliefs about the hierarchy in the IT group
 - beliefs about role of IT managers in IT projects
 - beliefs about the role of end-user on the project
 - beliefs about the IT knowledge level of managers
 - beliefs about the IT knowledge level of end-users
 - beliefs about what IT-managers think of the IT people
 - beliefs about what non IT-managers think of IT people
 - beliefs about what end-user think of the IT people
 - beliefs about the work ethics to be followed in the IT group
 - beliefs about who belongs to IT group and who doesn't
 - additional beliefs
- A description of the process to acculturate and socialize newcomers—both socially and at work
- Description of the demands of the job
- Informal reward systems

³ More detailed list of questions used for guiding the interview process is available upon request.



- Role of IT in organization
- Role of IT in society
- What do managers think is IT's role? Of IS personnel?

APPENDIX B: TOPICS COVERED IN INTERVIEWS OF MANAGERIAL PERSONNEL⁴

- Age, ethnicity, education, professional certifications
- Current employment, past employment: title, number of years, job responsibilities
- The understanding managerial personnel of the term *culture*.
- The relationship of managerial with members of their occupation, their sense of belonging and camaraderie.
- The reference group of managerial personnel, i.e., Whom do they go to for help on work-related problems?
- Tasks and responsibilities of members of their occupation
- Qualifications required to perform tasks
- Managerial/supervisory guidance and control on tasks
- Skills required to be managerial personnel—both managerial and non-managerial skills
- Who assesses the qualifications of the managerial personnel?
- Beliefs:
 - beliefs about the role of management principles in the organization
 - beliefs about the role of managers (general) for the organization
 - beliefs about the division of labor among the managerial personnel (Who should do what job?)
 - beliefs about the hierarchy among management personnel
 - beliefs about use of management jargon
 - beliefs about the role of end-user/consumers
 - beliefs about who belongs to managerial group and who doesn't
 - beliefs about the role of technology (Does it play leading role or supporting role?)
 - beliefs about the role of nontechnical managers in IS projects
 - beliefs about the role of IS managers
 - beliefs about role of IS personnel in the organization
 - beliefs about use of jargon by IS personnel
- A description of the process to acculturate and socialize newcomers—both socially and at work
- Description of the demands of the job
- Informal reward systems
- Role of managerial personnel in organization
- Role of managerial personnel in society

APPENDIX C: CODES FOR ANALYZING TRANSCRIPT

Table C-1: Codes for Analyzing Transcript

Source	Explanation
Esoteric Knowledge	Beliefs about esoteric knowledge for group
Extreme Demands	Beliefs about extreme or unusual demands
Consciousness of Kind	Beliefs about membership in groups
Consciousness of Kind	Beliefs about role in organizations
Primary Reference Group	Beliefs about who the primary reference group is
Social Image	Beliefs about the social image of group and social value of tasks performed
Cultural Forms	Beliefs about existence of cultural forms
Consciousness of Kind	Beliefs about relationships to peers
Consciousness of Kind	Beliefs about relationships of new members to groups
Social Image	Beliefs about IS managers
Social Image	Beliefs about non-IS managers
Relationship to End-Users	Beliefs about end-users
Grid Force: Division of Labor	Beliefs about division of labor in group
Grid Force: Hierarchy	Beliefs about hierarchy

Note: Codes were generated based on the group and grid dimensions of the Trice framework. No new codes were identified during the analysis.

⁴ More detailed list of questions used for guiding the interview process is available upon request.

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