

# **An Investigation of the Effect of Information Technology (IT) Culture on the Relationship between IT and Business Professionals**

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**Abstract:** The “cultural chasm” between business and information technology (IT) professionals and the importance of their developing and sustaining a healthy partnership has received attention in the IT literature. This study applies existing theories of culture and inter-group relations from the organizational behavior discipline to investigate how and why the IT culture affects these relationships. Insights as to how tensions in the IT-business relationship can be minimized by managing the IT culture are revealed.

**Keywords:** IT culture, IT-business relationship, cultural chasm

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## **1 Introduction**

The Information Technology (IT) group is often described as having its own culture different from that of the business, which can result in different codes of behavior (Ward and Peppard, 1996; Ward and Griffiths, 1996). Using the concept of culture as a basis for understanding differences between groups provides a foundation for understanding the generation of conflict (Dubinskas, 1992; Schein 1996). Through an awareness by both parties of IT culture and the effect that this culture has on the IT-business relationship, an effective IT-business partnership can be established, thus promoting a healthier relationship and a more desirable work environment that will ultimately lead to greater organizational success. It is important for organizations to understand and develop relationships between individuals, groups, and across organizational boundaries for effective operation (Musgrave and Anniss, 1996; Robbins, 1998; Ivancevich and Matteson, 1999).

An extensive review of related literature preempted development of a research model for assessing *the effect of the IT culture on the IT-business relationship*. The case study considered in this research included an analysis of interview transcripts from 11 IT professionals and 21 business professionals in five Australian organizations. Findings include compelling insights into the effect of the IT culture on the IT-business relationship.

Before proceeding further, it is necessary to distinguish between IT and business professionals. For the purpose of this research, IT professionals are regarded as those who make IT work (Markus and Bjorn-Andersen, 1987; Grindley, 1995). This broad category includes CIOs, information systems managers, systems analysts, designers, programmers, database administrators, and external specialists such as hardware vendors and manufacturers, software firms, and consultants (Laudon and Laudon, 2000). Business professionals are regarded as the remaining organizational members, specifically, “those who use IT” (Grindley, 1995, p.39). Thus, the expression “IT-business relationship” is used to indicate the relationship between IT professionals and business professionals.

## **2 Review of Existing Literature**

Previous research in the discipline of IT has been criticized for the lack of regard given to existing theory (Robey and Zmud, 1992). Existing theory should be used for three reasons. First, theory offers general predictions that can be tested. Second, communication between researchers can be improved by offering a standard language to describe complex subjects. Third, IT researchers must develop theoretically sound research projects rather than just presenting descriptive results. Additionally, IT research has been criticized for narrowly and economically focusing on investigating technology, design methods, computers, implementation, production tools, and

communication without adequate regard to the people factors involved (More, 1990; Avison and Fitzgerald 1991). This research addresses these criticisms by investigating and applying existing organizational behavior theories relating to culture and intergroup relations to describe the IT culture and identify weaknesses in the IT-business relationship.

In addition to addressing the criticisms of previous IT research, this study extends the body of knowledge relating to the “cultural chasm” between business and IT professionals, acknowledging that academic research on the IT culture is lacking (Ward and Peppard, 1996). Also, the presence of a “cultural chasm” between business and IT and the need for effective relationships between business and IT has long been recognized in the Information Systems (IS) literature (Henderson, 1990; Keen, 1991; Wang, 1995; Ward and Peppard, 1996; Black, 1997). The problem this research addresses – *the effect of the IT culture on the IT-business relationship* – is not new. Under different guises, it has been raised on several previous occasions. “How can we end the tradition of monologues and mutual frustration between business and IT professionals?” (Keen, 1991, p.19); “How is culture related to conflicts in organizations?” (Dubinskas, 1992); and “Can the concept of cultural assumptions help us understand such problems of adoption and implementation (of IT)? If so, what is their nature and what can be done to reduce cultural conflict within the organization if managerial assumptions clash with IT assumptions?” (Schein, 1992, pp. 277-278).

Regardless of the wording, the problem remains unresolved. No one has yet fully articulated the cause and scope of the disconnect between business and IT professionals (Wang, 1995). Prior research has focused on describing the symptoms and consequences of tensions in the IT-business relationship and how to end these

frustrations without looking at the causes (Bostrom and Heinen, 1977; Ward and Peppard, 1996). To progress the analysis of the cultural gap between business and IT professionals, it is necessary to investigate the causes and understand the reasons for these tensions before attempting to solve them (Ward and Griffiths, 1996; Ward and Peppard, 1996). Following these suggestions, this study extends previous research by providing insights into how the IT culture affects the IT-business relationship.

### **3 Organizational Culture**

The concept of organizational culture originates from the field of anthropology where the term “culture” is given to the customs and rituals that societies develop over time (Schein, 1992; Vecchio, Hearn, and Southey, 1996). In recent years it was observed that not only do societies develop their own cultures, but organizations also develop and perpetuate their own cultures (Schein, 1992). This culture developed by organizations is referred to as organizational culture.

Organizational culture is defined as a shared set of beliefs, values, and norms present in an organization expressed through organizational structures, control systems, power structures, symbols, ceremonies, myths, rituals, special languages, and stories that in turn influence people’s behavior (Baker, 1980; Schein, 1992; Johnson and Scholes, 1993; Trice, 1993; Vecchio et al., 1996; Robbins, 1998). These beliefs, values, and norms are passed on to incoming employees (Vecchio et al., 1996), communicating the correct way to think and act and how things should be done (Sankar, 1988).

Several models for assessing organizational culture have been developed and successfully tested, providing helpful frameworks for assessing organizational culture. Table 1 summarizes seven of the more widely acknowledged models for assessing organizational culture. A comparison of these seven models reveals no significant

variations regarding the elements of culture. Each model refers to a tacit level of assumptions and beliefs that are reflected through organizational artefacts. Therefore, any one of these models could be successfully applied to assess the culture within an organization.

(Insert Table 1 here.)

The described models were reviewed to enable the researchers to select an appropriate model to assess the IT culture in organizations. After consideration of the seven models for assessing organizational culture, model C7 — the Johnson and Scholes (1993) model illustrated in Figure 1 — was selected as the preferred model for assessing the IT culture in organizations. This model presents culture as a web. The center circle, the paradigm, represents a core set of values, beliefs, and assumptions common to the organization. These values, beliefs, and assumptions are reflected through the outer circles, which represent the cultural elements of stories, symbols, power structures, organizational structures, control systems, and rituals and routines.

(Insert Figure 1 here.)

Stories are tales told by members of an organization. Symbols refer to the type of language used, logos, and office layouts. Power structures reflect the powerful managerial groupings in an organization. Organizational structures refer to the way in which an organization works. Control systems emphasize what is important in the organization, and rituals and routines define the way work is done (Johnson and Scholes, 1993).

The Johnson and Scholes (1993) model was selected for three main reasons. First, this model encompasses all of the elements of culture identified by other researchers. Second, this model highlights some of the more visible aspects of culture

and links these back to values, beliefs, and assumptions, making the concept of culture easier to study and analyze. Third, this model has been successfully used by Ward and Peppard (1996) to assess the IT culture and is also recommended by Ward and Griffiths (1996) as useful for assessing IT culture in organizations.

The IT literature was reviewed for important themes of IT culture that related to cultural elements common to IT groups. To focus the review of the literature, the themes of culture identified from research by Johnson and Scholes (1993) and Ward and Peppard (1996) provided a useful starting point. These themes and their related literature sources are listed in Table 2.

(Insert Table 2 here.)

Previous research that has touched on IT culture has typically only addressed one of the “harder” elements of culture, such as organizational structures, control systems, or power structures, and often neglected the “softer” issues such as stories and myths, symbols, and rituals and routines (Hirschheim and Newman, 1991; Ward and Peppard, 1996). This research presents a unified view of IT culture, drawing together previous research on the various elements of culture and also incorporating the “softer” issues of culture.

### *3.1. IT-Business Relationship*

A dysfunctional relationship between business and IT professionals has existed since the first widespread application of computers to business problems in the late 1950s and 1960s (Doll and Ahmed, 1983; Ward and Peppard, 1996). Indeed, the arrival of the computer and the IT industry has challenged traditional forms of management, administration, and authority. “A manager’s job is complicated and demanding. (Gottschalk and Karlsen, 2006, pp. 138 ) Management techniques developed over the past years have not been successful when applied to the

management of IT (Grindley, 1995, p. 14). “With IT being a relatively recent arrival on the managerial landscape, business managers have not developed the kind of experience and expertise that they have developed in other business disciplines such as Finance and HR” (Keen, 1991,p. 9).

Many attempts have been made to improve relations between IT staff and the rest of the business (Broadbent, 1996). However, few organizations have managed to successfully resolve the troubled relationship (Ward and Peppard, 1996). There is still the dilemma of mismatched expectations between business and IT (Broadbent, 1996). In fact, tensions in the IT-business relationship have become self-perpetuating (Black, 1997). Repeated project failures, project delays, and cost overruns are the cause of much frustration regarding technology and destroy the credibility of IT (Doll and Ahmed, 1983; Wang, 1995). In turn, these credibility problems reduce the status and influence of IT, which may create further difficulties in gaining management cooperation, responsiveness, involvement, and securing resources (Doll and Ahmed, 1983). As a result, management becomes less willing to work with IT, leading to an uncomfortable relationship (Keen, 1991). Once IT has lost its credibility, restoring business confidence in IT may take years. An IT group with low credibility may continue to experience low status and influence for several years (Doll and Ahmed, 1983).

Considerable research effort has been applied to define the IT-business relationship. These models, summarized in Table 3, can be categorized into two major groups: theories and models for assessing the *current* status of the IT-business relationship (Models 1 through 4) and theories and models useful for assessing the *evolving* IT-business relationship (Models 5 through 9). Of these nine models, many are purely descriptive and have not been empirically tested. From a review of the

nine models, model R1— the Henderson (1990) model — was selected for this research as the preferred model against which to test the effects of the IT culture and also identify weaknesses in the IT-business relationship.

(Insert Table 3 here.)

The Henderson (1990) model, illustrated in Figure 2, is built around two dimensions of partnership:

1. partnership in context – key factors necessary for a long term relationship;
2. partnership in action – key factors that create an effective day-to-day working relationship.

For an effective long-term relationship, three key ingredients were identified: mutual benefits, commitment to the relationship, and predisposition. An effective day-to-day relationship also requires three key ingredients: shared knowledge, dependence on distinctive competencies and resources, and organizational linkages (Henderson, 1990, p. 10).

The Henderson (1990) model was selected for a number of reasons. Models that discuss and describe the *evolving* relationship were eliminated, as they were considered inappropriate for this research. Models that assess the evolving relationships would be difficult to apply, as this requires studying the evolution of IT in an organization. Such a study would involve a longitudinal study and data collection techniques such as reviewing historical records and interviews with past employees. Research suggests that it is difficult to undertake longitudinal studies in organizational environments due to staff changes (Franz and Robey, 1987). Models used to assess the CEO/CIO relationship were also excluded, as access to the CEO/CIO may have proved difficult in some organizations. Additionally, the scope of this research was to address the IT-business relationship in general, not the

relationship between two roles in an organization. Of the remaining models, Henderson's model is the most prescriptive and is often cited in the literature on IT-user relationships. Additionally, this model was adapted by Subramani, Henderson, and Coopriider (1998) to test whether a consensual view was positively related to the performance of IS providers. Therefore, Henderson's model was selected as the preferred model against which to test the effects of IT culture and also identify weaknesses in the IT-business relationship.

To predict the effects of the IT culture on the IT-business relationship, each theme of IT culture identified in the literature was reviewed against the indicators of the determinants of the IT-business relationship. These indicators, shown in Table 4, were adapted from Henderson (1990) and Subramani, Henderson, and Coopriider (1998).

### *3.2. Culture and the IT-Business Relationship*

The culture gap between IT specialists and the rest of the business has repeatedly been used as one variable to explain the troubled relationship between business and IT professionals (Keen, 1991; Griffiths, 1994; Ward and Peppard, 1996). "An understanding of the effects of individual differences on technology use is important in overcoming barriers to the diffusion of technology across an organization." (Yuandong, Zhan, and Lai, 2006). This disconnect between business and IT has been explained by the birth and growth of IT, business managers experience with IT, the changing role of IT, mismatch between business and IT planning processes, accounting responsibilities and knowledge, failure of IT to understand business, implications of technology, and the lack of management appreciation for the potential of IT to improve business performance (Keen, 1991; Grindley, 1992). To further complicate this issue, outsourcing and increased technological advances have changed

the landscape of the environment in which the IT worker must now function.

(Brooks, 2006).

The history surrounding the birth of IT in organizations suggests that IT brought with it a culture of its own that clashed with the dominant organizational culture. An overwhelming number of companies have been unable to absorb IT professionals into their organizational culture (Grindley, 1992). Many organizations had their own system of values and beliefs; and the emergence of the discipline of IT imposed on the existing culture, resulting in tension in the IT-business relationship (Ward and Peppard, 1996, p. 38). The community of IT professionals grew out of a population that had its own set of values, assumptions, and jargon, all of which was unfamiliar to those from other areas of the business (Wang, 1995). Because of these differences, IT and business have gradually diverged and the gap has grown.

Business management inexperience is another reason given for the cultural gap. The arrival of the computer and the IT industry challenged traditional forms of management, administration, and authority. The application of management techniques developed in business over the last 200 years do not seem to work properly when applied to computers (Grindley, 1995). With IT being a relatively recent arrival on the managerial landscape, business managers have not developed the kind of experience and expertise in IT that they have in other disciplines such as Finance and HR (Keen, 1991).

The changing role of IT over the years is also documented as a reason for the cultural chasm between business and IT. The philosophy of information systems has evolved from being a process-oriented back-room function, to a strategic information-oriented function (Ward and Griffiths, 1996). As a back-room function, IT was considered an overhead (Keen, 1991); and those responsible for the management of

these systems were left alone to practice their “dark art” (Thomsett, 1993). Hence, business managers could ignore IT. The 1970s saw the emergence of hierarchical databases, rudimentary networks, a more structured approach to systems development, the “token” involvement of users in the design of systems, and the adoption of project management techniques from the construction and manufacturing industries (Thomsett, 1993). This decade was notorious for repeated project failures (Doll and Ahmed, 1983) and the business perceived a lack of service from computing people (Thomsett, 1993), both of which impacted the credibility of IT in organizations. During the 1980s, with the explosion of PC technology, responsibility for IT development moved away from IT departments, creating IT management issues of control of resources, incompatibility of hardware and software, and data integrity (Ward and Peppard, 1996). This growth of IT was not accompanied by commensurate improvements in the understanding of information (Stamper, 1973 cited by Avison and Fitzgerald, 1991). As primarily a service department, IT has a difficult task that can easily lead to conflict and dissatisfied users (Lucas, 1984). Just a little more than 30 years old, IS has now matured to a stage where it has become an important aspect of every day business (Keen, 1991) and an integral part of every day life (Senn, 1990). IT is no longer a back room function, but an icon of every day living; business managers can no longer afford to ignore it if they are to achieve organizational success.

Whatever the reasons for the culture gap between business and IT, there is sufficient evidence to suggest that the culture gap is a deep-rooted problem that can result in a poor IT-business relationship (Ward and Griffiths, 1996). This poor relationship may be a risk to information system success (Hirschheim, Klein, and Newman, 1991; Warne, 1997). Additionally, enormous amounts of time and energy

are wasted every day because of incompatibilities between the IT and organizational cultures (More, 1990). So, who is to blame — the IT professionals or the business professionals? Each group thinks the other is from a different planet. However, “we are all from the same planet” (Moriarty, 1997, p. 14). The answer to the culture gap lies in developing an effective relationship between business and IT (Gunner and Gulden, 1986).

In summary, the concepts of culture and intergroup relations are closely related, and culture provides the basis for understanding conflict. Looking at group conflict through the lens of culture allows a deeper understanding of this conflict (Dubinskas, 1992). In turn, this conflict between groups can be used to better understand why IT fails in organizations (Hirschheim et al., 1991).

With the recognition that the culture gap between business and IT is a major problem in organizations (Grindley, 1995) this research empirically collects data to identify how the IT culture affects the IT-business relationship. Finding solutions to this problem is important, as a clash between business and IT cultures can result in a poor IT-business relationship and an IT organizations ability to add value to the business (Ward and Griffiths, 1996; Robbins,1998).

Although it is widely recognized that the culture gap between business and IT professionals is a major problem in organizations today (Grindley, 1992; Ward and Peppard, 1996), few models have been developed to investigate the troubled relationship from a cultural perspective. These models are summarized in Table 5. All three models reflect similar sources of tension mostly relating to the different perceptions held by business and IT professionals in relation to goals, roles and responsibilities, and poorly defined strategies and benefits. Although these models offer a useful starting point for exploring tensions in the IT-business relationship, they

are inadequate for this research for two reasons. First, these three models neglect to take a holistic view of culture and consider only selected elements of culture. Second, these three models are purely descriptive and have not been empirically tested. Given these two limitations, this research develops a fourth model (derived from the literature) for investigating the troubled relationship between business and IT from a cultural perspective. This model is presented and discussed next.

(Insert Table 5 here.)

### **3 Research Model**

From a review of the literature and selection of appropriate models to assess the IT culture and identify weaknesses in the IT-business relationship, the model illustrated in Figure 3 was developed for this research to investigate *the effect of IT culture on the IT-business relationship*. This model depicts the culture of the IT group affecting the IT-business relationship. The IT culture is represented by six elements: organizational structure, stories and myths, symbols, rituals and routines, control systems, and power structures. The effectiveness of the IT-business relationship is depicted by the degree of presence and convergence of views by IT and business of six determinants: mutual benefits, commitment, predisposition, shared knowledge, distinctive competency, and organizational linkages.

(Insert Figure 3 here.)

From the literature, the IT culture was predicted to have both positive and negative effects on the IT-business relationship. The IT culture was predicted to have a positive effect on the IT-business relationship if the IT culture reflected:

- a structure where IT played a strategic role;
- a structure where the IT director was a senior executive of the organization;
- success stories told about the IT group;

- a decentralized IT structure where IT professionals were physically located with their business colleagues;
- a systems development process that was followed to implement IT solutions;
- high dependence by the business on the IT group;
- high levels of expert power that benefited the business;
- high levels of information power.

Conversely, the IT culture was predicted to have negative effects on the IT-business relationship where the IT culture reflected:

- a structure where IT played a support role;
- a structure where IT did not have access to the senior executives of the organization;
- horror stories told about the IT group;
- extensive use of IT jargon;
- a failure to share information with the business;
- high staff turnover in the IT group;
- lack of business knowledge;
- a systems development process that was not adhered to by both business and IT;
- lack of involvement by the business in IT strategic planning;
- lack of involvement by the business in project management;
- high levels of expert power that benefited the IT group;
- low levels of position power.

With respect to the research model illustrated in Figure 3, two limitations should be noted. First, this model purely describes an associative relationship between the IT culture and the IT-business relationship and does not reflect a causal relationship

whereby the IT-business relationship is determined by the IT culture. Second, there may be many more themes of IT culture that were not identified in this literature review. Previous research was relied upon to direct the review of the literature in relation to IT culture.

#### **4 Research Design and Methodology**

A multiple case study approach was used to provide insights into the IT culture and the effect of the IT culture on the IT-business relationship. Data was collected from semi-structured interviews conducted with 11 IT professionals and 21 business professionals in five Australian organizations. The five organizations varied in size, industry, sector, and geographic location. Five cases are sufficient to determine whether the findings from individual cases are replicated, resulting in increased support for the initial propositions (Yin, 1994). The semi-structured interviews were designed to collect data to assess the culture of the IT group and the effects of the IT culture on the IT-business relationship. Each interview lasted for approximately one hour and was tape recorded. In addition to the semi-structured in-depth interviews, each interviewee responded to a structured written questionnaire administered at the end of each interview to collect information to identify weaknesses in the IT-business relationship. Data collection instruments were tested prior to the final study to ensure these instruments were valid for final data collection.

Data from the semi-structured interviews was triangulated with data collected from the structured written questionnaire and through observation and secondary sources such as the Internet and organizational records. The attraction of using multiple sources of data is that much more confidence is instilled in the research if the findings are validated through more than one source, and the risks and biases associated with the analysis and interpretation of the data are minimized (Yin, 1994).

In preparation for analyses, data collected from the semi-structured interviews was transcribed, coded to one of the six elements of IT culture, and loaded into the NUD\*IST qualitative analysis software program. To minimize misinterpretation when coding data, academics from the researcher's university and practitioners from within the case study organizations reviewed some of the more uncertain coding. This data was then analysed to assess the IT culture and the effects of the IT culture on the IT-business relationship, first within each case and second across all cases.

The data collected from the structured written questionnaire was coded and entered into the SPSS statistical analysis software program and then analysed statistically to identify weaknesses in the IT-business relationship across all cases. As the sample size was seven or less for each organization, weaknesses in the IT-business relationship were not identified in each individual case, as meaningful statistical analysis cannot be undertaken on small sample sizes (Zikmund, 1991).

The conclusions of this research were drawn from a comparison of the results of this research with the evidence from the literature in relation to the IT culture and the effects of the IT culture on the IT-business relationship. Additionally, the effects of the IT culture on the IT-business relationship were compared with weaknesses identified in the IT-business relationship to determine whether IT culture is associated with tensions in the IT-business relationship.

## **5 Results**

### *5.1. Background Information on Case Studies*

Table 6 provides basic information about the five Australian organizations that participated in this research. To protect the interests of those organizations, names have been withheld. For analysis purposes, these organizations are referred to as Case A through Case E.

(Insert Table 6 here.)

### 5.2. *Cross Case Analyses*

The cross case analyses provides insights into the IT culture, the effect of the IT culture on the IT-business relationship, and weaknesses in the IT-business relationship.

### 5.3. *IT Culture*

Data from the semi-structured interviews was analyzed to provide an understanding of the IT culture in each organization. The data was analyzed by reviewing interview transcripts for themes and patterns related to six elements of culture: organizational structure, stories and myths, symbols, rituals and routines, control systems, and power structures.

A distinct IT culture comprised of a number of themes was identified in each of the five cases. These themes are summarized in Table 7. Most of these themes reoccurred in two or more cases, therefore demonstrating literal replication logic (Yin, 1994). Few themes emerged where literal replication logic could not be demonstrated.

(Insert Table 7 here.)

In summary, in most organizations, business and IT did not share the same view about the role of the IT group. A few success stories and many horror stories were told in all cases, particularly about the failure of the IT group to meet time and cost targets. There was a lack of communication between business and IT groups, and IT people were perceived to be highly technical and lacking in business knowledge. Additionally, there was a high rate of IT staff turnover in most organizations. Procedures imposed by the IT group were unpopular in all organizations. IT

professionals managed projects in most cases, and the IT group was not perceived to be meeting the needs of business.

From this, it can be concluded that the IT group has a distinct culture distinguishable by six elements: organizational structure, stories and myths, symbols, rituals and routines, control systems, and power structures. The themes of IT culture identified in this research and the effects of these themes on the IT-business relationship are discussed next.

#### *5.4. Effects of the IT Culture on the IT-Business Relationship*

The semi-structured interview data was also analyzed to determine the effects of the IT culture on the IT-business relationship. The overall effects of the themes of IT culture on each of the six determinants of the IT-business relationship are shown in Table 8. Only effects of the IT culture on the IT-business relationship for which replication logic was reflected are included. These effects were determined by reviewing each theme of IT culture against the indicators of the six determinants of the IT-business relationship. These effects, summarized in a matrix, were either apparent from interview responses or they were derived from interview responses. The effect of each theme of IT culture on each of the six determinants of the IT-business relationship is reported as either positive (+) if the cultural theme had a positive effect on the IT-business relationship, or negative (-) if the cultural theme had a negative effect on the IT-business relationship.

(Insert Table 8 here.)

Potential sources of conflict in the IT-business relationship were due to:

- opposing views by business and IT on the role of the IT group;
- the IT director not positioned as a senior executive of the organization;
- horror stories told about the IT group;

- lack of effective communication between IT and business;
- high staff turnover in the IT group;
- a poorly skilled IT group;
- lack of business knowledge by the IT group;
- the IT group being located separate from the rest of the business;
- a poorly implemented decentralized IT structure;
- ineffective Help Desk procedures or Customer Service request procedures;
- ineffective systems development procedures;
- lack of involvement by business people in project management, and responsibility of project management being left to the IT group;
- inability of the IT group to meet the needs of the business;
- the IT group using their expert power to their own advantage, and the business group having little control over this.

On the other hand, the following cultural themes contributed to a healthy IT-business relationship:

- the IT director positioned as a senior executive of the organization;
- horror stories that resulted in the business taking more responsibility for the actions of the IT group;
- success stories told about the IT group;
- technical competencies of the IT group;
- successfully implemented decentralized IT structure;
- business becoming more involved in the strategic direction of IT;
- management of projects by highly skilled IT people;
- business control of IT expenditures;
- business being highly dependent on IT.

In summary, it can be concluded that the IT culture can have both positive and negative effects on the IT-business relationship. Additionally, it can be concluded that the IT culture is such that mutual benefits are not derived from the relationship, IT and business groups have a poor attitude towards cooperation, there is a lack of shared knowledge between business and IT, and there is a lack of organizational linkages between business and IT.

#### *5.5. Weaknesses in the IT-Business Relationship*

A structured written questionnaire was designed to elicit the viewpoints of business and IT professionals on a number of indicators that related to the six essential ingredients of an effective relationship: mutual benefits, commitment, predisposition, shared knowledge, dependence on distinctive competencies and resources, and organizational linkages. Attitudinal responses to 26 statements on the questionnaire were coded and entered into SPSS for analysis, and descriptive and non-parametric tests were conducted on the data to identify weaknesses in the IT-business relationship.

Weaknesses were identified in the IT-business relationship if it was lacking in an essential ingredient or if business and IT groups had opposing views on a statement. Descriptive statistics in the form of frequency distributions were generated on the responses to each statement on the structured written questionnaire. The results highlighted the indicators of a healthy IT-business relationship that were lacking, hence identifying weaknesses in the IT-business relationship. Non-parametric Mann-Whitney U tests were conducted on the responses to the structured written questionnaire statements to identify the statements for which IT and business had opposing views.

From these tests, weaknesses in the IT-business relationship were identified in relation to four determinants: mutual benefits, commitment, shared knowledge, and organizational linkages. These weaknesses, summarized in Table 9, resulted from a lack of shared knowledge and lack of organizational linkages between business and IT and also opposing views by business and IT in relation to: the contribution of IT to improved business efficiency, the extent to which IT supports organizational goals as opposed to pursuing their own agenda, and the extent to which IT people are available to meet business needs.

(Insert Table 9 here.)

## **6 Recommendations**

Based on the results of this research, specific recommendations are made to help improve the relationship between IT and business professionals.

The role of the IT group must be clearly defined and communicated. This should include defining the contribution of the IT group (articulating mutual benefits), ensuring the goals of the IT group are aligned with the goals of the organization (demonstrating commitment), and communicating this information to the business (sharing knowledge). This can be achieved through joint meetings between IT and senior management where the role of IT is clarified and agreed to. This role can then be communicated to the organization using a number of marketing strategies, such as e-mails, induction programs, personal communication, and posters.

There must be a regular exchange of knowledge between the senior executives of the organization and IT management, enabling the IT group to become aware of business activities and senior executives to increase their IT knowledge and awareness of IT issues. In addition, there must be joint involvement of senior

management and IT management in social and organizational processes, strengthening organizational linkages.

IT employee successes and IT success stories should be promoted, recognized, and rewarded. IT successes can be communicated using a number of techniques such as issuing awards and rewards, through promotional material, or through media including notice boards, staff newsletters, and e-mail.

Communication between IT and business must be improved. The IT group should review both what they communicate and how they communicate. The relationship between business and IT is enhanced when jargon is avoided. Avoiding jargon and encouraging the free flow of information enhances the IT-business relationship through increasing shared knowledge between the two groups, it encourages organizational linkages, and it builds trust (predisposition).

Action should be taken to retain IT staff. Some strategies for consideration include rewards for staff, recognition for good work, increased involvement of IT staff in business activities, and increased training for IT staff in both business skills and IT skills. Further, organizations should also consider implementing strategies to capture knowledge when staff move on and to pass this knowledge on to others. Strategies an organization can implement to achieve this include: ensuring that more than one person is knowledgeable in a specific task, skills transfer prior to a person leaving, and improving systems documentation.

Effort should be made to develop IT teams with both IT and business skills. This can be achieved through a variety of means. Organizations can encourage hybrid managers such as a business manager with a sound understanding of IT, or an IT staff member with strong business skills. Organizations should also strive to recruit individuals with appropriate IT and business skills. In addition, organizations could

implement formal induction programs and on-going training programs to provide their IT groups with technical and business skills to minimize tensions in the IT-business relationship.

IT professionals should be co-located with business professionals. In addition, reporting lines must be clearly defined and communicated, so there can be no confusion by either business or IT professionals as to how this decentralized IT structure works.

Help Desk procedures should be improved. A Help Desk must provide timely service to business professionals and also implement systems that provide feedback to business professionals on the status of their requests for Help Desk support.

IT and business groups should be jointly involved in the systems development process. The IT group must design systems in terms of client business goals rather than in terms of technology goals. Business professionals can become more involved and knowledgeable in the systems development process through the creation of joint processes in the organization and the joint involvement by both business and IT groups in these processes.

Joint information systems strategic planning processes must be created to help to bridge the gap between the business and IT groups, build better communication between these two groups, enhance the probability of IT success, and result in significantly better cooperation (Boynton and Zmud, 1984; Ein-Dor et al., 1984; Saaksjarvi, 1988; Byers and Blume 1994).

Joint project planning processes should be developed and implemented involving both business and IT professionals. This will improve organization linkages.

Control and ownership of IT expenditures should be exercised by the business group. This can be achieved through joint planning workshops, joint project

management, joint cost/benefit analysis studies, improved reporting and communication of IT expenditures, and joint meetings where IT expenditures are reviewed.

Backlogs should be minimized. This can be achieved through a number of strategies, including revisiting priorities and commencing with a new list of work to be completed, implementing a customer request procedure to help prioritize work requests, implementing a user pays systems for requests for help, and putting on additional staff to help complete high priority work.

Expert power should continue to be exercised by the IT group, but with caution. Business managers should be educated in how to recognize this expert power and learn how to manage technological innovation in organizations so they can better control it (Lucas, 1984).

## **7 Conclusions**

This study makes three major contributions to research. First, it addresses a deficiency in IT research by introducing theories from the organizational behaviour discipline. Second, this study contributes to research by extending previous studies that relate to the “cultural chasm” between business and IT. Third, this study brings together previous research on elements of the IT culture and its effect on the IT-business relationship, providing insights into its effects. These insights provide a starting point for reconciliation between business and IT. Using these insights, practitioners can consider strategies to help foster a healthy relationship between business and IT (Baker, 1980; Walsham, 1993; Schein, 1996; Ward and Peppard, 1996). Also, through an awareness of their own culture and how this may contribute to conflict, IT professionals can change their behavior to promote cooperation rather than conflict with their business counterparts.

Implications of this research for managerial decision making lies in the potential for other organizations to apply this research model to assess the effect of IT culture on the IT-business relationship in their own organizations. Alternatively, these organizations may choose not to apply the model, but rather consider the effects of certain cultural characteristics of IT on the IT-business relationship. Following this, managers can consider strategies to foster a desired culture and achieve a healthy IT-business relationship.

However, all practitioners desiring to use the results of this research to introduce cultural changes should note that there may be factors other than cultural differences that result in intergroup conflict, such as political behavior and external influences. Also, an organization that copies the culture of a successful organization's culture may not recognize the same success: the Japanese business culture, although successful in Japan, failed when introduced in America (Choi and Keleman, 1995). Therefore, the findings of this research should not be applied in isolation from consideration of these and other factors. In addition, it should be noted that the recommendations from this research should not be considered as "action items" for practitioners on how to implement and manage cultural change. The organizational behavior theory on culture makes suggestions on how to manage cultural change. Practitioners should also be aware that "cultural change takes a long time to achieve" (Noble, 1997, p. 32).

In summary, this research has provided insights into how the IT culture in organizations may contribute to tensions in the IT-business relationship through investigating the effects of six elements of culture on six determinants of the IT-business relationship. Prior to this research, it was implied that IT culture was largely responsible for tensions in the IT-business relationship. Through applying

organizational theories on culture and relationships and bringing these together, this research advanced the position of previous research resulting in a clearer understanding of *specifically* how the IT culture affects the IT business relationship. As a result, this research has made several contributions to theory and practice.

Researchers and practitioners alike now have more extensive information on how business relationships are affected by cultural differences. Thus, practitioners are better informed in order to take appropriate action to improve the IT-business relationship, thereby increasing their organization's success level.

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**Table 1.** Summary and Comparison of Seven Models for Assessing Organizational Culture

<i>Research Models</i>	<i>Elements Of Culture</i>		
	<i>Explicit</i>	←—————→	<i>Tacit</i>
Model C1: Schein (1992)	Artifacts	Esoused values	Underlying assumptions
Model C2: Krefiting & Frost (1985)	Artifacts	Perceptions Values	Underlying assumptions
Model C3: Martin & Siehl (1983)	Artifacts Management Practices	Esoused values	Underlying assumptions
Model C4: Marcoulides & Heck (1993)	Task organization Organizational structure Organizational purpose Organizational climate	Organizational values Worker attitudes Worker goals	
Model C5: Pliskin et al. (1993)	Top management contact Reward orientation	Innovation and action orientation Risk taking Performance orientation Autonomy in decision making Integration and lateral interdependence	
Model C6: Hofstede et al. (1990)	Symbols Heroes Rituals	Values	
Model C7: Johnson & Scholes (1993)	Symbols Stories and myths Rituals and routines	Control systems Organizational structure Power	Paradigm

**Table 2.** Themes of IT Culture

<i>Elements of IT Culture</i>	<i>Themes of IT Culture</i>	<i>Source</i>
Organizational Structure	Role of IT	Lucas (1984); Raghunathan & Raghunathan (1989); Keen (1993); Lederer & Mendelow (1988); Avison, Cuthbertson, & Powell (2000); Ramakrishna & Lin (2000)
	Positioning of IT	Doll & Ahmed (1983); Lederer & Mendelow (1987, 1988); Raghunathan & Raghunathan (1989); Watson (1989); Grover et al. (1993); Ward & Peppard (1996); Howarth (1999)
Stories and myths	Horror Stories	Selig (1991); Cannon (1994); Wang (1994); Ward & Peppard (1996); Yourdon (1997); Harrison (2000)
	Success Stories	Rockart, Earl, & Ross (1996); Ward & Peppard (1996)
Symbols	Communication	De Brabander & Thiers (1984); More (1990); Hirschheim, Klein, & Newman (1991); Hirschheim & Newman (1991); Keen (1991, 1993); Rubin (1991); Kennedy (1997); Nelson & Coopriider (1996); Ward & Peppard (1996); Wilson (1996)
	Staff Turnover	Keen (1993), Black (1997a); Hirschheim et al. (1988); Paré, Tremblay & Lalonde (2000)
	Characteristics and Skills	Kaiser & King (1982); Dos Santos & Hawk (1988); McFarlan (1990); Davies (1991); Grindley (1992); Smith & McKeen (1992); Kennedy (1997); Wang & Barron (1995); Bushell (1996); Rockart, Earl, & Ross (1996); Tomes (1996); Ward & Peppard (1996); Jackson & Wilson (1999)
	Physical Location	Robey & Zmud (1992); Smith & McKeen (1992); Broadbent et al. (1995); Ward & Peppard (1996); Jackson & Wilson (1999)
Rituals and Routines	Systems Development Processes	Keen, Bronsema, & Zuboff (1982); Doll & Ahmed (1983); Markus (1983); Robey & Markus (1984); Gunner & Gulden (1986); Barki & Hartwick (1989); Davies (1991); Hirschheim & Newman (1991); Rubin (1991); Smith & McKeen (1992); Broadbent et al. (1995); Keen (1993); Marakas & Hornik (1996); Fletcher & McCann (1997); Laudon & Laudon (2000)
Control systems	Strategic Control	Gunner & Gulden (1986); Galliers (1987); Lederer & Mendelow (1987, 1988); Earl (1989); Keen (1991); Rubin (1991); Selig (1991)
	Project Control	Brookes et al. (1982); Doll & Ahmed (1983); Rubin (1991); Hann (1992); Keen (1993)
Power Structures	Interdependence Power	Lucas (1984); Smircich (1985); Markus & Bjorn-Anderson (1987); Robey & Zmud (1992); Jackson & Wilson (1999); Paré, Tremblay, & Lalonde (2000)
	Expert Power	Hensel & Schkade (1995); Markus & Bjorn-Anderson (1987); Raghunathan & Raghunathan (1989); Hirschheim, Klein, & Newman (1991); Robey & Zmud (1992)
	Position Power	Lucas (1984); Keen (1991); Robey & Zmud (1992); Jackson & Wilson (1999); Paré, Tremblay, & Lalonde (2000)
	Information Power	Markus (1984); Hensel & Schkade (1995); More (1990)

*Source: Developed from the literature.*

**Table 3.** Summary and Comparison of Nine Models for Assessing the IT-Business Relationship

<i>Research Models</i>	<i>Components of the Relationship</i>		
Model R1: Henderson (1990)	Partnership in context: mutual benefits, commitment, predisposition Partnership in action: shared knowledge, dependence on distinctive competencies and resources, organizational linkages		
Model R2: Feeny, Edwards, & Simpson (1992)	CEO attributes Organizational attributes CIO attributes		
Model R3: Jackson & Wilson (1999)	Mutual goals Openness Respect Shared responsibility and risk		
Model R4: Ross, Beath & Goodhue (1996)	High levels of respect Excellence in communication Coordination and negotiation Shared knowledge		
	<i>The Evolving Relationship</i>		
	<i>Early Stages of the Relationship</i>	←————→	<i>Mature Relationship</i>
Model R5: Hirschheim et al. (1988)	Delivery	Reorientation	Reorganization
Model R6: Galliers & Sutherland (1991)	Adhocracy Starting the foundations	Centralized dictatorship Democratic dialectic and cooperation	Entrepreneurial opportunity Integrated harmonious relationship
Model R7: Hedberg (unpublished) in Ward & Peppard (1996)	Technologists explore technology	Technologists meet the needs of the business	Strategic change through application of technology
Model R8: Ward & Peppard (1996)	Support role Operational role	Strategic role	High potential role
	<i>Types of Relationships</i>		
Model R9: Ward & Griffiths (1996)	Financial relationship Contractual relationship	Organizational relationship	Intimate relationship

**Table 4. Indicators of the Determinants of the IT-Business Relationship**

<i>IT-Business Relationship Determinant</i>	<i>Indicators of Determinants</i>
<u>Partnership in Context (indicators of an effective on-going relationship)</u>	
Mutual benefits	Financial contribution Operations efficiency and increased innovation Increased quality of work life
Commitment to relationship	Nature of formal agreements or contracts Extent of shared goals Organizational incentives to cooperate
Predisposition	Trust Existing attitudes based on track record
<u>Partnership in Action (indicators of an effective day-to-day relationship)</u>	
Shared knowledge	Knowledge of each others task environment, decision environment and social environment
Dependence on distinctive competencies and resources	Dependence on partner's personnel, skills and physical assets
Organizational linkages	Creation of joint processes Joint involvement in operational processes Information exchange Social linkages and good personal working relationships

*Source :Developed from the literature.*

**Table 5.** Comparison of “Culture Gap” Models

<i>Research Model</i>	<i>Sources of Tension in the It-Business Relationship</i>
Model CR1: Smith & McKeen (1992)	Disagreement about control of computerization Differences in goals and timeframes of managers Lack of measurable benefits Disagreement over roles and responsibilities during systems development
Model CR2: Ward & Peppard (1996)	Differences in perceptions, roles, and metaphors
Model CR3: Ward and Griffiths (1996)	Lack of shared values No agreed strategies Failed projects and systems

*Source: Developed from the literature.*

**Table 6.** Participating Organizations

<i>Case</i>	<i>Description</i>	<i>Number of Employees</i>	<i>Number of IT Staff</i>	<i>Interview Period</i>
<b>A</b>	Financial organization	400	20	October 1999
<b>B</b>	State government agency	6,500	80	October – December 1999
<b>C</b>	Travel company	30,000	800	November 1999
<b>D</b>	Commonwealth government agency	4,000	100	November 1999
<b>E</b>	Retail company	80,000	250	January 2000 – April 2000

*Source: Analysis of secondary data and interview data.*

**Table 7. Themes of IT Culture**

<i>Elements of Culture</i>		<i>Themes of IT Culture</i>	<i>Cases</i>					<i>Lit. rep.</i>
			<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
Org. Structure	(1a)	Support role	✓					
	(1b)	Opposing views on the role of IT		✓	✓	✓	✓	yes
	(1c)	IT director is a senior executive	✓		✓			yes
	(1d)	IT director is not a senior executive		✓		✓	✓	yes
	(1e)	Small organization size	✓					
Stories and Myths	(2a)	Horror stories	✓	✓	✓	✓	✓	yes
	(2b)	Success stories	✓		✓	✓	✓	yes
Symbols	(3a)	IT group takes caution not to use jargon				✓		
	(3b)	Lack of communication between IT and business		✓	✓	✓	✓	yes
	(3c)	Low staff turnover	✓					
	(3d)	High staff turnover		✓	✓	✓	✓	yes
	(3e)	IT are highly analytical, technical, and boring	✓	✓	✓	✓	✓	yes
	(3f)	IT people are arrogant			✓			
	(3g)	IT group is poorly skilled				✓	✓	yes
	(3h)	Good business understanding	✓					
	(3i)	Lack of business knowledge		✓	✓	✓	✓	yes
	(3j)	Centralized IT structure	✓			✓	✓	yes
	(3k)	Decentralized IT structure		✓	✓			yes
	(3l)	In-house software development	✓					
	(3m)	Uniform worn by Help Desk staff					✓	
Rituals and Routines	(4a)	Help Desk procedure/ Customer service request procedure	✓	✓	✓	✓	✓	yes
	(4b)	Systems development process	✓	✓	✓	✓	✓	yes
	(4c)	Government policies / User pays procedure		✓		✓		yes
Control Systems	(5b)	Business gaining strategic control			✓		✓	yes
	(5b)	IT controls strategic direction	✓			✓		yes
	(5c)	Loosely defined strategic control		✓				
	(5d)	IT people manage projects	✓	✓		✓	✓	yes
	(5e)	Reluctance by anyone to control projects			✓			
	(5f)	Business controls IT expenditure		✓	✓			yes
Power Structures	(6a)	Business highly dependent on IT	✓			✓	✓	yes
	(6b)	IT not meeting business needs		✓	✓	✓	✓	yes
	(6c)	Lack of position power		✓				
	(6d)	High levels of expert power			✓	✓		yes
	(6e)	Diminishing levels of expert power		✓				

✓ shows the cases from which the theme of culture emerged.  
Source: Analysis of within-case analysis (all cases) analyses.

**Table 8.** Overall Effects of IT Culture on the IT-Business Relationship

<i>Elements of Culture</i>	<i>Themes of IT culture</i>	<i>Determinants of the IT-Business Relationship</i>				
		<i>Mut. ben.</i>	<i>Com.</i>	<i>Pred.</i>	<i>Shr know.</i>	<i>Org link.</i>
Org. Structure	(1b) Opposing views on the role of IT				-	
	(1c) IT director is a senior executive				+	+
	(1d) IT director is not a senior executive				-	-
Stories and Myths	(2a) Horror stories	-		-		+
	(2b) Success stories			+		
Symbols	(3b) Lack of communication			-	-	
	(3d) High staff turnover				-	-
	(3e) IT are highly analytical, technical and boring			+	+	
	(3g) IT group are poorly skilled	-				
	(3i) Lack of business knowledge				-	
	(3j) Centralized IT structure					-
	(3k) Decentralized IT structure	-				- / +
Rituals and Routines	(4b) Help Desk Procedure	-				-
	(4c) Systems development process	-		-	-	
Control Systems	(5a) Business gaining strategic control		+			+
	(5b) IT controls strategic direction					+
	(5d) IT people manage projects					+
	(5f) IT expenditure is controlled by business					+
Power Structures	(6a) Business highly dependent on IT					+
	(6b) IT not meeting business needs	-		-		
	(6d) High levels of expert power					-

+ indicates the theme of culture had a positive effect on the determinant of the relationship.

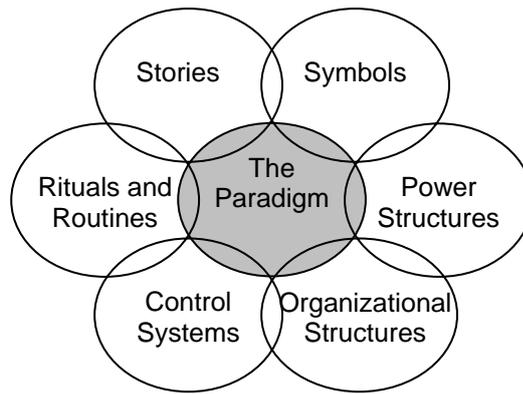
- indicates the theme of culture had a negative effect on the determinant of the relationship.

Source: Analysis of results of within-case analysis (all cases).

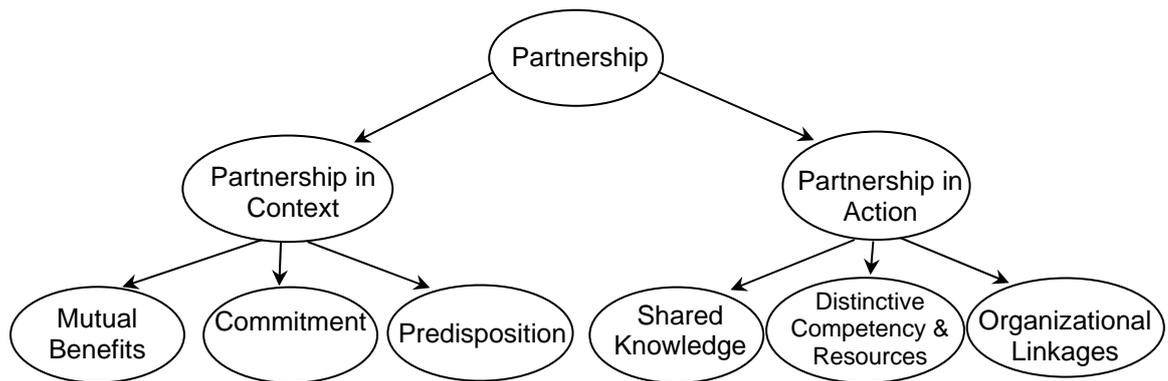
**Table 9.** Weaknesses in the IT-Business Relationship

<i>Determinant</i>	<i>Statements that indicated the IT-business relationship was lacking in an essential ingredient.</i>	<i>Statements where IT and business had opposing views.</i>
Mutual benefits		3 – The extent to which IT contributes to improved business efficiency
Commitment to relationship		4 – The extent to which IT supports the goals of the organization? 5 – The extent to which IT pursue its own agenda
Shared knowledge	15 – The extent to which the business has undertaken training in order to work more effectively with IT 16 – The extent to which IT has undertaken training in order to work more effectively with the business	
Organizational linkages	26 – The extent to which there are social linkages between business and IT	25 - The extent to which IT makes itself available/ approachable to meet the needs of the business

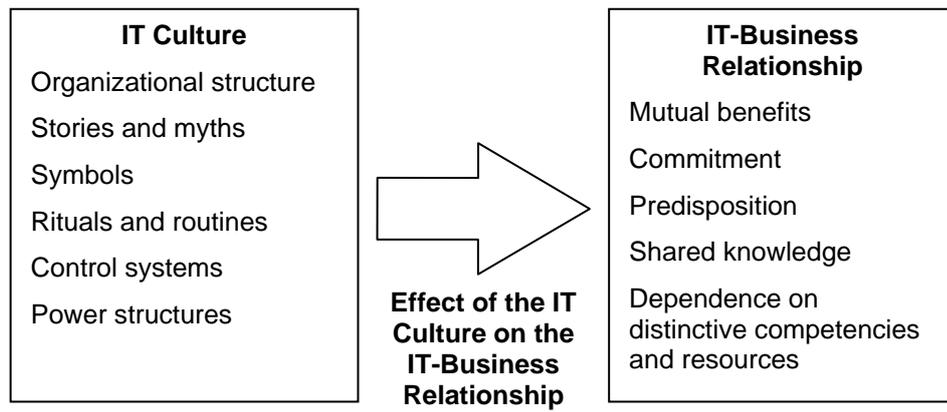
Source: Analysis of data.



**Figure 1.** The Cultural Web of Organization  
 Source: Johnson and Scholes 1993, p. 61



**Figure 2.** Six Determinants of a Partnership  
 Source: Henderson (1990, p. 10)



**Figure 3. Research Model**  
Source: Developed for this research