

# Exploring the IT-User Gap: towards developing communication strategies

David Tuffley  
Griffith University

School of Information and Communication Technology  
Griffith University  
Brisbane, Queensland, Australia  
Email: D.Tuffley@griffith.edu.au

## Abstract

*It has long been recognized that a gap exists between IS developers and users. It has been called by many names, and a variety of solutions have been proposed to bridge the gap. Yet, despite these efforts the problem seems as pervasive as ever, and efforts to solve it have been limited in effectiveness. This paper explores the nature of the gap that leads to poor communication between IS developers and system users, and which has been cited as a principal reason why user requirements are not captured to the necessary level of detail and completeness, resulting in lower levels of system usability.*

## INTRODUCTION

A survey of the relevant literature, both practitioner and academic, points to there being a fundamental difference in mindset between technology developers and the users of that technology. This difference has given rise to a host of problems, not least of which is the inability of developers and users to effectively communicate during the requirements gathering process, resulting in systems that do not meet the users needs. Software development is an activity requiring a mindset permeated by technological considerations. Software developers will naturally have a tendency towards a technical perspective, which is reinforced through hard work and experience on the job. The software developers view of the world derives from a technological perspective. Software users on the other hand typically will have a non-technical view of the world, using it simply as a tool as they go about their daily lives. For them, technology is a means to an end, not an end in itself.

In order to explore the nature of this difference, it is helpful to think of it in terms of organisational culture. Culture in this context refers to an organization's way of thinking about the world, how to get things done. Software developers have their own culture, their own deeply ingrained ways of doing things. Such a culture might find it difficult to readily understand, much less embrace the seemingly foreign culture of the business user, with their own priorities, preoccupations, and ways of doing things.

One clear feature of culture is that it is resistant to change. It protects itself from change, finding ways to actively neutralize perceived threats to it. It is perhaps for this reason that solutions such as Joint Application Development (JAD), and Participative Design (PD) are not widely embraced. They are seen as contrary to the way things are done in a particular work setting, and perhaps seen as being time consuming and expensive. These are all good reasons to avoid using them if you are a hard-pressed project manager.

If the problem is to be solved, the solution must not be perceived as a threat to the organisational culture of the software developer, nor to the user's culture. This is where the business analyst is often positioned. They act as mediators between the software developers and the users, analysing the nature of the business requirements. Yet business analysts are not used as frequently as they might. They are often not a routine member of the software development team, particularly where budgetary constraints are tight. This is where the technical writer might usefully perform the role of facilitating communication between developer and user. The technical writer is already a member of the development team and poses little threat to the internal culture of the development team. Indeed given the reluctance of many software developers to write documentation in general, they are likely to be welcomed in the role of developing the software requirements specification. A technical writer in the context of this project is defined as a person who produces software development project documentation such as requirements specifications. Examples of other software development project documentation include, but is not limited to, project plans, quality plans, design documents, test plans.

## **AIM & RESEARCH METHODOLOGY**

This action research project is aimed at exploring the underlying causes of the communication gap that leads to such undesirable consequences. It proposes a practical solution to a problem that has demonstrated ongoing resistance to a solution. The proposed solution is to use a technical writer to act as a mediator of communication between stakeholders who often do not communicate effectively, due to a range of cultural issues.

The action research project was carried out by a researcher who was acting in the capacity of technical writer on a 12 month, on-site software upgrade project at a major commercial organization.

The research strategy focuses on the following three elements:

- Action research consisting of five stages; reflection, planning, action/observation, reflection and write-up conclusions.
- Technical writer uses software user requirements template to apply a structured and comprehensive approach to process of requirements gathering.
- Technical writer acts as a facilitator of communication by applying facilitation derived from Joint application Development.

For the purposes of this project, Johnson and Scholes (1999) model of organisational culture is used. The model is comprised of six elements clustered like daisy petals around a central paradigm: organisation structure, stories and myths, symbols, rituals and routines, control systems and power structures.

Given the unpredictable nature of the research site and the individuals that interact with each other during the research event, this model offers a useful vehicle for the exploration of the nature of the cultural gap in general, and how communication between IS developer and user might be better understood in relation to the development of user requirements.

This paper will explore:

- The nature of cultural differences
- Categorizing the Gap
- The user-developer communication process
- A model for understanding organisational culture
- Comparison of a large organization with an SME
- A proposed practical solution to the problem

## **CULTURAL DIFFERENCES**

IS developers apparently possess characteristics that inhibit their working relationship with other members of the organisation. Grindley (1991) did a survey of IS directors and found that 46% reported that the culture gap between IS professionals and business counterparts was their most important challenge in terms of service delivery. 56% believed that the culture gap inhibits their organization's ability to achieve strategic advantage using IS. Given that 56% of IS directors, or what might be called today chief information officers, is a revealing figure. CIO's are in a unique position to evaluate the effectiveness or otherwise of their department. Subordinates would not necessarily be in a position to recognize the scope of the problem that is constituted by the cultural gap inhibiting their organization's ability to implement strategic information systems development.

Grindley explains that the culture gap is manifested by IS professionals and their business counterparts having differing approaches to motivation, goals, language, and problem-solving. These differences brought about not only difficulties in communication, which is an overt manifestation of the gap, but also reveals that the mind-set is likely to be different. Mind-set can be said to be a covert manifestation of the cultural gap. Having different notions of goal-setting and problem-solving are indicative of these differences. Grindley's findings are consistent with the earlier findings of researchers such as Edstrom (1977), Gingras and McLean (1979), and Zmud and Cox (1979) when they reported on the distinctive ways of thinking and acting of IS professionals. Given the relatively old age of these studies it is worthwhile to note that despite a comprehensive search of the academic literature, relatively little has been done in recent years that explores this apparently persistent problem.

Taylor-Cummings and Feeny (1997) also highlight the existence of what they call the 'cultural gap' between IS developers and users, a factor which has been blamed for the failure of IT projects since IT projects first began in the 1950s. This cultural gap is widely acknowledged but poorly defined. Definitions of the culture gap are descriptions of the symptoms, rather than the culture gap itself. While it is not well defined, its existence is causing rising alarm among IS management. Taylor-Cummings and Feeny (1997) mention a 1991 Price

Waterhouse survey of IT directors in the UK, in which 47% of respondents said this culture gap is their biggest problem. 56% thought the gap was seriously hampering their organization's efforts to gain strategic advantage.

Taylor-Cummings and Feeny (1997) attempt to define the culture gap between IS developers and users in terms of two metaphors - organizations as cultural systems, and organizations as political systems (Morgan, 1986). Taylor-Cummings' and Feeny's (1997) definition is based on concepts of cultures and sub-cultures, diverse interests, conflict and power. This is a useful definition in the sense that it frames the problem in terms of culture. Other definitions discussed in this section have focused on differences in the thought processes of participants, those cognitive elements that comprise differing mind sets. Taylor-Cummings and Feeny recognize the explicit existence of organisational culture, with sub-cultural elements within the broader organisational culture who have competing priorities and interests that then lead to conflict as each subculture attempts to realize their own particular goals and priorities. Power is sought after as a necessary way of achieving goals.

Wang (1994, p1) defines the culture gap as 'a conflict, pervasive yet unnatural, that has mis-aligned the objectives of executive managers and technologists and that impairs or prevents organizations from obtaining a cost-effective return from their investment in information technology'. This statement highlights the nature of the gap in terms of a misalignment of objectives. This is in agreement with Grindley's earlier study that discussed the problem in terms of different approaches to goal setting, problem solving and language. This misalignment of objectives causes impairment of an organization's achievement of cost-effective systems development because the two categories of stakeholder pulling in different directions.

In recent times this misalignment of strategic objectives, or the differences in language, approaches to goals and problem-solving, has been recognized and discussed in terms of the Business-Technology gap. Baster et al (2001) refer to Business-Technology gap (B-T gap) in terms of technology specialists lacking the domain expertise to react rapidly to changes in the business environment, while business users lack the technology skills to maintain the systems. This is discussing a gap in which the two categories of stakeholder are unable to adequately recognize, understand and accommodate the needs and wishes of the other. Technology specialists are identified as having well-developed skills at implementing technology, but do not have sufficient understanding of the way in which the domain or industry operates at commercial level. Domain specialists on the other hand have well-developed understandings of the commercial realities of their industry, but have only a sketchy understanding of how technology can be applied strategically to believe organisational objectives.

Hornik et al, (2003) highlight that good communication between IS professionals, IS staff and IS users is critical to the successful completion of an IS development project. They point out that the ability to interact with all potential stakeholders in an organisation, to clearly document requirements, and to effectively express ideas has long been recognized by researchers and practitioners as critical success factors.

Mann (2002) notes that there is little literature on the gap between end-users and the IT department. It has been observed that IT personnel have different personality traits than does the general population, going some way towards explaining why there is a gap. Martinsons & Chong (1998), and Shore (1998) discusses the important skills required for working in and IT environment, particularly those needed for effective collaboration with end-users.

While there is relatively little academic literature dealing with the IT user gap, recent practitioner literature is increasingly vocal on the subject. It is recognized in this practitioner literature that a serious gap exists, and that organizations are using a variety of approaches to close it. It is an acknowledged and understood that practitioner literature is not strictly admissible, however given the relative scarcity of academic literature on a topic that is of some considerable interest to the practitioner community helps to strengthen the claim that the gap between users and developers is a significant one and worthy of further investigation in an academic sense.

## CATEGORIZING THE GAP

The gap has been categorized in no less than nine ways in the academic and practitioner literature (Mann, 2002):

1. The **Perspective Gap** when the point-of-view of one stakeholder group is incomplete or ill-conceived. Developers may lose sight of the necessity for Systems to provide value to the business by meeting evolving business goals and that the IT department is not the centre of the universe. Users sometimes lose sight of technology as being a tool, and not an end in itself (Mann, 2002).
2. **Ownership Gap**: where developers feels a sense of proprietary ownership over the infrastructure, while users feel ownership over the business processes, leading to the demarcation disputes and territorial conflict that strain the relationship and create misunderstandings and misconceptions. Users can get the impression that developers are technical elitists, and developers come to see users as reactionary detractors (Mann, 2002).
3. **Cultural Gap**: when the stakeholder groups display different traits, values, working behaviours, and/or priorities due to each group attracting certain kinds of person, or acculturates members in the group.

Developers tend to be more introverted, analytical, using rational persuasion to influence others. Business users are usually more extroverted, intuitive and use more sophisticated influence strategies. Both users and developers tend to adopt the culture of their respective professions (Mann, 2002).

4. **Foresight Gap:** where one stakeholder group has greater insight into how the future might unfold, but is unable to communicate that vision convincingly to the other stakeholder group. Developers may be well placed to foresee that a user proposed solution cannot work from a technical point-of-view. Alternately users may be better at determining that a developer proposed solution will not be acceptable to them, or will have a negative impact on some aspect of their operations (Mann, 2002).
5. **Communication Gap:** where one stakeholder group simply fails to understand what the other is saying. It is often said by users that Developers have an impenetrable jargon, yet it is also observed that the users may well have their own well-developed jargon. Developers find it difficult to translate the user needs of business units into useful productive systems because they do not understand the business processes and underlying rationale for them. (Mann, 2002).
6. **Expectation Gap:** where users have unrealistic expectations about what developers are feasibly able to do. Users have come to expect more from systems because they have generally become more computer literate, or because they have become accustomed to the sometimes heroic efforts of developers to deliver the goods. At the same time, developers are sometimes known to make overblown claims as to what they can deliver, expecting all users to be technologically naïve (Mann, 2002).
7. **Credibility Gap:** where the past performance of developers has been substandard. This is often attributable to failed development projects, or poor customer service such as a not very helpful helpdesk. From the developers perspective, they may have found users to be overly demanding and/or resistant to change (Mann, 2002).
8. **Appreciation Gap:** where one stakeholder group implicitly feels unappreciated by the other. Developers may form a view that their hard work, long hours and contributions to the organization go unappreciated except when something goes wrong. There is some suggestion that developers, in some cases, wish to be more involved in business planning, but are not invited to do so (Mann, 2002).
9. **Relationship Gap:** where the stakeholder groups do not interact with sufficient frequency to be able to form a viable, constructive relationship as the basis for ongoing work. This might be reinforced by entrenched preconceptions about the other group (Mann, 2002).

From the literature discussed in this section, it would seem that communication is of fundamental importance, both as an enabler of successful project outcomes, and as an indicator of a gap. Poor communication is cited as one manifestation of a cultural gap between stakeholders (differing approaches to motivation, goals, language, and problem-solving, Grindley, 1991). Taylor-Cummings' and Feeny (1997) discusses the nature of the gap in terms of cultures and sub-cultures, diverse interests, conflict and power. Communication is a consistent factor in each of these elements. Good communication enables the reconciliation of diversion and interests, poor communication makes the problem worse. Wang (1994) discusses the nature of the culture gap in terms of a misalignment of the stakeholder's objectives. The communication process necessarily mediates the formulation of objectives and strategic plans.

An examination of these categories highlights the importance of developing effective communications strategies, an area that will be examined the next section.

## THE USER-DEVELOPER COMMUNICATION PROCESS

The Information Systems literature has long recognized that user participation during development projects is desirable. (Gallivan and Keil, 2003) Users who are more involved during the requirements determination process are more likely to feel they have a stake in the system, and therefore are more likely to be satisfied with the system. It has been implicitly assumed that any user participation is beneficial, yet this is not necessarily the case. Gallivan and Keil (2003) suggest that project managers and software developers must look beyond the information content that users provide. They should also investigate what information users may not be readily volunteering, and try to create an environment in which users feel free to openly discuss their concerns, regardless of whether these concerns are positive or negative in character.

Gallivan and Keil (2003) acknowledge that user participation in system development is critical to the successful design and implementation of systems, but that it is dangerous to assume that user participation necessarily leads to successful project outcomes. They discuss the concept of power asymmetry between developers and users. Where developers had sanctionary power over users, users would be less inclined to adopt a system that they had jointly designed developers, even when the users had explicitly agreed to use the said system. Ineffective

communication occurs when developers have this sanctionary power over users. It makes it more likely that they (the user) will not use a conjointly designed system (Gallivan and Keil 2003).

User-developer communication strategies can be seen as a function of organisational culture. It might therefore be useful to examine an appropriate model for understanding organisational culture such that effective communication strategies might be developed.

## A MODEL FOR UNDERSTANDING ORGANISATIONAL CULTURE

Johnson and Scholes (1999) propose a model of organisational culture that can be broken down into six elements, grouped like daisy petals around a central paradigm. These six elements include organisation structure, stories and myths, symbols, rituals and routines, control systems and power structures. The central paradigm is constituted by the assumptions of how the world works, and which those within the organisation implicitly accept. The paradigm offers a framework for comprehending the complexity of the environment in which the organisation exists.

The six elements are described as follows:

1. **Formal organisational structure**, or the more informal ways in which the organisation works, reflect power structures and delineate important relationships
2. **Stories**. The stories related by individuals that embed historical events in the present and highlight important events and personalities.
3. **Symbols** like logos, offices, cars and titles; or the type of language and terminology commonly used; and which become a short-hand representation of the nature of the organisation.
4. **Routines and Rituals**. The routine ways that members of the organisation behave towards each other, and that link different parts of the organisation. Rituals include training programmes, promotion and judgments that indicate relative importance in the organisation.
5. **Control systems**, measurement and reward systems that emphasize what is important in the organisation, and which focus attention and activity.
6. **Power structures**, the most powerful managerial groupings in the organisation are likely to be ones most associated with core assumptions and beliefs about what is important.

The six elements outlined by Johnson and Scholes (1999) comprise the set of variables that constitute the gap, and provides a detailed model for analysing the nature of the gap.

## COMPARISON OF A LARGE ORGANIZATION WITH AN SME

Arising from a 12-month action research project in which the organisational culture of a small software developer was compared with that of a large corporate organisation, an analysis was performed using Johnson and Scholes' model. The context of the analysis was that the small organisation was operating as a development unit within the larger corporate environment.

The small organisation comprised around five individual software developers whose specific domain expertise had been contracted by the larger organisation. The association of the two organizations had been ongoing over the previous three years. The purpose of the smaller organisation was to develop a suite of information systems to support the corporate aims of the larger organisation.

The results of the analysis of grouped according to the six elements as discussed in the previous section, and are summarized in table below:

<b>Element</b>	<b>Large organisation</b>	<b>Small organisation</b>
Structure	hierarchical	flat
Stories	past/present	present/future
Symbols	affluent	economical
Routines/ Rituals	formal	informal
Control	punishment	reward
Power Structures	paternalistic	entrepreneurial

Table 1: Summary of cultural differences using Johnson & Scholes 1999 model

It can be seen from this table that on all six dimensions a continuum exists in which the large and small organization's occupied somewhat opposing ends. Hierarchical versus flat management structures, formal versus informal routines and rituals etc. Communications strategies that take account of this variability need to be developed to reconcile these differences if in an effective working relationship is to be achieved.

The results of this analysis can be generalized to include organizational units within a larger organisation, such as the IT development group and their relationship with other business units.

## CONCLUSION

Clearly, there are significant issues arising from the gap that apparently exists between the different stakeholders of information technology development projects. The nature of the gap has been explored and categorized in this paper, and is seen in the context of organisational culture. Johnson and Scholes' model provides a useful conceptual basis upon which to think about organisational culture, and to perform an analysis that might be helpful when developing communication strategies to bridge the gap.

Using this model to analyse the differing natures of two organizations interacting with each other over a 12 month period during a software development project shows considerable difference between the two cultures, highlighting the need to better understand the nature of the gap. The study focused on an independent contracting organisation performing development services within the larger organisation. To some extent this has polarized the results in the way seen in table 1 above. There is however some relevance in the case of development groups within organizations. The cultural differences may not be so extreme, given that it is all one organisation, however there is still relevance when one internal group sees itself as being separate from other groups within the same organisation.

The evidence of the research project that gave rise to the above summarized results points clearly to be benefits of having an existing member of the software development team act as a facilitator of communication between developers and users. These benefits include deriving a clearer and more comprehensive understanding of the user requirements that can then form the basis of the developed system. This avoids the problem of discovering shortcomings in functionality after the system has been implemented, and is therefore to relate to remedy.

Where available, business analysts traditionally perform this role. In the absence of a business analyst a technical writer might effectively be substituted in the role. The technical writer's ability to understand both technical and non-technical perspectives makes them well-qualified for this task. The technical writer also poses little threat to the organisational culture of the software development team, and is therefore more likely to be accepted, even welcomed as someone willing to take on the task of developing the requirements specification document.

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