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INFORMATION SYSTEMS ACCEPTANCE: A CONSEQUENCE OF CULTURES

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Executive Summary

This paper investigates the literature on organisational culture and national culture, drawing them into a framework that may be used for both systems developers and researchers. Research hypotheses are developed and illustrative cases are described.

Our overall concern is the way in which information systems are accepted in organisations, and while much research examines the technical performance of systems, relatively little has looked at the way in which people understand information presented by systems. Every system operates in the context of a group of users, within organisations, within national settings. Furthermore, data only becomes information when perceived to be that by people. The perceptions are coloured by the set of understandings, knowledge, values and attitudes of the recipient.

The Information Systems Acceptance Model (ISAM) that we propose is presented in the form of a closed loop but may be regarded as hierarchical, starting with an analysis of the societal (or national) culture. For example, societal cultures differ in the way groups share information, how risks are handled, and in information sharing across status ranks.

The second stage of the ISAM model looks at organisational culture. Dynamic, organically-operating organisations differ dramatically from stable bureaucracies in the way in which information flows in the organisation.

Within an organisation, at the third stage of the model, there are differences between different groups of users, particularly with the tolerance to change created through information technology and with the strategic potential (or threat) posed by new systems. Thus it is necessary to analyse the user group's perception of the system.

The fourth stage is concerned with the acceptance of the information produced by the information system, that is, to what extent is it reliable, useable and timely. It also covers the perceptual gap between information produced in a report or on a screen, and the intended or required information. This is a more common technical analysis that would be the concern of practitioners already.

The final stage is concerned with the adoption or assimilation of the technology into the organisation, so that it becomes part of the background. As a technology, or indeed a particular information system becomes institutionalised, then there is feedback that modifies the perceptions, attitudes and values of people. We have 'closed the loop' in our model, to show the assimilated technology causing changes in the societal culture. We have seen this happen rapidly recently with the world wide web, but it is usually slower and proceeds 'backwards' through users and user groups, to the organisational level and then, eventually to a societal level.

We close by discussing examples of technologies that have followed different acceptance levels in Asia than in the west, and highlighting alternative research proposals.

Cultural Confusion.

Defining culture can be a difficult proposition. Many different classifications exist in relation to national culture (Kluckhohn and Strodtbeck 1961; Rokeach 1973; Hall, 1959 1990; Hofstede 1984; Hofstede and Bond 1988) and also in relation to organisational culture (Weber 1951; Williamson 1975; Ouchi 1981; Boisot 1987). Their co-relationship complicates the issue. According to Hofstede (1980), national culture shapes the type of organisations and the nature of social structures. However, the nature of this relationship is far from clear. Supporters of the convergence theory claim that, due to influences such as technology and globalisation, societies will become more and more alike; others who support the divergence theory believe that national differences are not only here to stay but one of the most crucial problems for management - in particular for the management of multinational and multicultural organisations. (Hofstede 1984, Cheung and Burn 1994; Lewis 1996).

Whatever the theory, there appears to be consensus that culture has a definite influence on organisations and their management. Comparisons of countries in terms of their work values, goals and attitudes have been the focus of numerous organisational and management studies (Terpstra and David 1985; Tung 1993; Ralston et al 1992), however, it has been a much neglected variable in relation to information systems (IS) research with some rare exceptions.

IS researchers have used culture based explanations of their findings most typically on comparisons of key issues of concern for IS management (e.g. Watson and Brancheau 1991; Burn et al 1993). These often relate to stages of economic development of a country rather than to a definable variation in culture. This is also the case in comparisons of national IS policies where government attitudes are held to be representative of cultural norms (King and Sethi 1992; Lally 1994). Where culture has been selected as the central focus for the study then typically IS researchers have chosen to adopt Hofstede's classifications (1984 1994) as the basis for comparative analysis (Grover et al 1994; Bryan et al 1995; Shore and Venkatachalam 1995).

The Information Acceptance Model.

In all areas of human activity, the behaviour of people is affected by the values and attitudes that they hold and the societal norms which surround them. Values are beliefs that people hold about desirable states of affairs and ways of doing things. When values are widely shared by a group of people then this provides them with a common mechanism by which they can share understandings and interpretations of their world, establish what is important and clarify priorities. These collective patterns of behaviour are an intrinsic part of national culture but are also strong influencers on organisational culture.

These interacting factors have a particular importance for IS success since data only becomes information when it is interpreted by a person and this interpretation, of necessity takes place against the backdrop of an individual's culture (Tricker 1988).

The way in which information is accepted (interpreted, accessed, used, disseminated) is therefore central to the way IS will be used in an organisation or society. Understanding this, as an IS professional, is essential to ensure IS success and especially so in the development of systems which will operate in cross-cultural or global environments. The model which is depicted in figure 1 is presented as a culture based framework for IS acceptance. This framework will be developed through the rest of this paper by first examining the theories related to societal, organisational and information culture. Then we consider the acceptance of the information from the system and finally the adoption or institutionalisation of the system. At this point the institutionalised system feeds back into the societal, organisational and information culture, although we have used a shorthand to show the effect only on the societal culture.

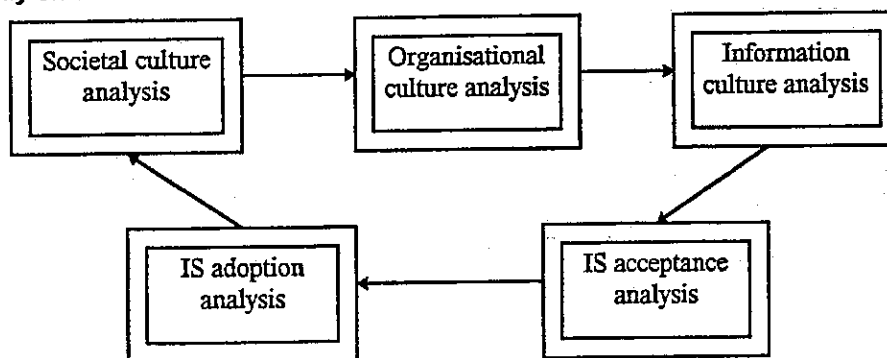


Figure 1 A Culture Based Framework for Information Systems Acceptance

Societal Culture.

Hofstede (1980 1994) suggests that the differences in cultural values are ultimate determinants of human organisations and behaviours and ultimately of economic growth. His 1980 study identified four dimensions by which national cultures differed. These were: uncertainty avoidance, individualism vs collectivism, masculinity vs femininity and power distance. These have been well documented in a number of studies with the most noticeable differences between Eastern and Western societies relating to collectivism and power distance, both high in Eastern societies and generally low in Western countries.

This work was later extended (Hofstede and Bond 1988) to introduce a fifth dimension: Confucian dynamism which was found, more than any other dimension, to account for and explain differences in economic growth around the world. This fifth dimension is particularly relevant to the differences which exist between Eastern and Western societies and in practical terms refers to a long-term versus short-term orientation in life. The key principles are:

- The stability of society is based on unequal relationships between people.
- The family is the prototype of all social organisations
- Virtuous behaviour towards others consists of not treating others as one would not like to be treated oneself.
- Virtue with regard to one's tasks in life consists of trying to acquire skills and education, working hard, not spending more than necessary, being patient, and persevering.

The first two principles obviously incorporate the high power distance and collectivism characteristics which were identified as Asian traits in earlier studies. The latter two are therefore worth further consideration. All work and social encounters are viewed as exchanges of resources and hence the need to honour social debts such as to one's teachers or former bosses. By honouring these, one acquires face and one can then be in a position to ask a favour. It is prudent to acquire as much face and give as many favours as possible since one's life is in the hands of fate and while one may be gaining higher status it is always needful to anticipate that fortunes could change rapidly, if not, for oneself then perhaps for a prodigal son.

This means that work and social interactions are conducted in a very different manner from encounters in Western societies. Networks of relationships have far greater significance and face can be gained by hosting large banquets for one's associates but not by flaunting one's wealth with ostentation.

While Hofstede and Bond's classifications are both interesting and valuable they are not unique and have much in common with other taxonomies of cultural influence. Kluckhohn and Strodtbeck's (1961) classification suggests six dimensions that embody the concepts of collectivism and power distance but also many of the concepts embodied in Confucian dynamism suggesting that this is not solely an Eastern concept but one which applies in many societies but expressed in different symbols. This classification has much in common also with Hall's (1959, 1990) taxonomy.

Lewis (1996) suggests that basically all these elements can be combined into three categories:

- linear-active (task oriented, highly organised, planners)
- multi-active (people oriented, loquacious, interrelators)
- reactive (introvert, respect-oriented, listeners)

This classification highlights time orientation (Hall 1990) and primary mode of activity (Kluckhohn and Strodtbeck 1961) but also serves to show that there is no clear dichotomy in cultural relationships. people can combine characteristics to a greater or lesser degree hence favouring a particular model but with tendencies to adopt other models in specific situations or environments. He gives as extreme examples of each type the nationalities of German, Latin American and Japanese respectively.

Westwood (1995) provides a useful summarisation in his definition of the core cultural elements which can be used to identify the extremities on a cultural spectrum between the United States and East Asia. These comprise five elements : relationship to the environment, power distance, collectivism, universalism, causality and space. Using all these theories it is possible to build up a composite model of Cultural Dimensions as shown in Table 1.

These can all be related directly to information cultures but it is also first necessary to recognise the implications which national cultural assumptions may hold for organisation cultures as discussed in the following section.

Dimensions	Cultural assumptions
relationship between people relationship with environment masculinity	good/bad by nature; dominance /harmony; aggression/ passiveness
power distance; space	small/large; private/public
collectivist relationships	individual/group
active/reactive primary mode of activity	talk/listen; doing/being
linear/multi-task time orientation	procedural/unpredictable monochronic/polychronic
universalism	generalist/particularist
context	facts/opinions
temporal orientation Confucianism	past/present/future; long or short term orientation

Table 1 Societal culture dimensions

Organizational Culture Analysis

The Transaction Costs Perspective.

From the viewpoint of Williamson (1975), organisations come into their very existence because of information. The uncertainty of the marketplace, characterised by information about transactions, drives individuals into forming or joining organisations, while the continuing uncertainty in the environment of the organisation leads it to changes in its strategy and structure. Williamson's ideas were extended by Boisot (1987) to incorporate a cultural perspective. Boisot looks at information in organisations through two attributes of the information, its "codification" and "diffusion":

codification	the degree of formal representation
diffusion	the degree of spread throughout the population,

and the ways that these two dimensions affect information transactions. These conform almost exactly with Hall's (1990) definition of information flow . How structured and fast is the exchange of messages between individuals and organisations?

Dichotomising organisational forms based upon these two dimensions leads to the categories shown in Figure 2. Codified information is the norm in formal business settings and so gives rise to the major structural forms. If information is centralised (i.e. undiffused) a bureaucracy form results, whereas, if it is widely distributed a market is in effect. Bureaucracies correspond closely to Williamson's description of hierarchies but his model is enriched by the additional dimension of codification. A Fief is controlled by an individual in whose mind most of the real ('soft') information resides, while a Clan has diffused but uncoded information, such as in a group of like- minded professionals.

codified information uncodified information	Bureaucracy (hierarchy)	Market
	Fief	Clan
	undiffused information	diffused information

Figure 2 Organisation forms with Information Codification and Diffusion (Boisot 1987)

This interpretation of organisational forms through information analysis can be further expanded through work from the societal culture perspective.

Societal culture perspective

Hofstede (1980 1994) categorised organisational forms according to their scores on power distance and uncertainty avoidance as shown in Figure 3.

	High Uncertainty Avoidance	Low Uncertainty Avoidance
Low Power Distance	Workflow Bureaucracy	Implicitly-structured Non-bureaucracy
High Power Distance	Full bureaucracy	Personnel bureaucracy

Figure 3 Uncertainty avoidance, power distance and organisational forms (from Hofstede 1980)

These four organisational types correspond to those found in the Aston studies (Pugh and Hickson 1989) through the association of dimensions:

Aston Dimension	Hofstede Dimension
structuring of activities	uncertainty avoidance
concentration of authority	power distance

Thus for each of the four combinations (high and low values on both scales) there is a preferred organisational form that varies with culture.

It would be foolish to believe that national culture is the only factor to be considered in organisational development. It is generally accepted, however, that Asian organisations tend to exhibit some distinctive structural features. Typically they remain small and they are characterised by higher levels of centralisation while resisting complexity (Redding 1990). Role differentiation and specialisation are also less extensive and rigid.

Analysis of an organisation's structure and its culture reveals its fit within the societal context and indicates the role for information within the organisation. Many details of the analysis have been omitted for the sake of brevity.

Information Culture.

Information Acceptance Models.

Table 1 shows some of the cultural assumptions which influence societies and their impact on organisational cultures. These have implicit impacts on the information acceptance models which will predominate in societies and hence the information systems which will be found to be most relevant to organisational decision-making. The nine collective dimensions which are presented in Table 1 are briefly reviewed in relation to their influence on information acceptance and hence to the value of MIS.

Relationships and Temporal Orientation.

In a western society, emphasis is directed towards controlling the world and management through change. Formal bureaucratic rule systems need constant flows of information to monitor and control activities. Formalisation is a means to depersonalise relationships and elaborate information systems are required to enforce the impersonal rule system.

Whereas in an eastern society, conformity and preservation of the status quo is much more worthy than the ability to change and control the environment. In such "situation acceptance" cultures (Leung 1992) managers are more likely to tolerate and adapt to traditional mores rather than try to change these. The need for information systems which can provide support for decision-making is considerably reduced and the benefits of an MIS or EIS radically diminished.

Power Distance, Space and Universalism.

Small power distance cultures expect wide dispersion of power and hence a high level of delegation. This implies a high level of decision-making autonomy and staff empowerment. Information flows must be open and extensive, must cater for accountability at all levels of decision-making and should facilitate empowerment. Information systems are viewed as ideal vehicles for information diffusion and readily accepted by all levels within the organisation. This is a typical western model..

A high level of power-distance may mean that management information becomes precisely that - information for managers only and hence there may be pressure to generate only the information that is acceptable for management control. Low power distance situations are the most conducive for user-friendly development of information systems and where methodologies that are authoritative or control oriented will work least well.

Collectivism and Confucianism.

In Confucian culture, it is self evident that all men are born unequal and hence an efficient society requires an unquestioned source of authority and a hierarchical ranking. The Western concept of worker empowerment which can be driven by IS and IT would not normally be welcomed in an oriental society and the global users may, therefore, be unable to apply the output from the system to the same effect.

Linearity, Time and Activity.

Western cultures have proceeded under a linear, mechanical, uni-causal paradigm that makes it feasible to extrapolate past and present events into the future. This naturally supports systematic and quantitative approaches to decision-making and planning and hence the system favours MIS as a support for long term planning (Westwood 1995). Eastern societies are less inclined to differentiate facts and figures from opinions and experiences and so intuition plays a much more important role in decision-making (Leung 1992). These are not generally supported by sophisticated information systems.

Context and Codification

Hall (1990) distinguishes between high and low context cultures with regard to the way in which they locate and extract meaning from communication contexts. In a low context culture such as the US speech is direct and explicit and so words tend to have a high value, particularly in written form. Direct and specific forms of communication are valued and there is an implicit understanding that 'you say what you mean'. In this culture information should be open and accessible and formal IS are seen to be in support of this right.

In high context cultures such as Asia, words are assumed to convey only a partial message and, indeed, cannot be taken at face value since their implicit meaning may have far more to do with the inflection or body language which accompanies them rather than the words themselves. In this environment codifying business information into simplified forms has low perceived utility and value and may further change the meaning completely when viewed out of context. Information systems are very poor vehicles for conveying such rich meanings.

Information Flow and Uncertainty Avoidance.

High levels of uncertainty avoidance can raise some organisational activities to the level of a ritual that is carried out for its own sake, rather than for the results that are achieved. For example, excessive reliance on planning and control systems, stronger belief in accounting figures than in "gut-feel" for the organisation's achievements, and excessive use of formalised reports and memos. A management information system may attain an unwarranted status and be viewed as a command system rather than as a decision support.

On the other hand, a low level of uncertainty avoidance may lead managers to have no interest in information systems since the ability to control or plan in the organisation may be seriously doubted. These factors will all influence the users' capacity to absorb new procedures and to interact with systems in a uniform manner.

Cultural Impacts Of Information Technology.

The impact of information systems and technology has extended far beyond organisational boundaries and pervades every aspect of daily life around the globe. Many of the changes which IT has brought about were foreseen and have been well documented. The concepts of a global world, virtual organisations, networked communities, home offices have all been touted as the result of the information explosion and the advancements in technology. However, many of these IT based applications have unlooked for consequences which relate directly to cultural mismatches between the philosophy of the system application or methodology and the cultural philosophy in which it is expected to operate. IT innovations generally bring about greater user empowerment and help to promote flatter organisational structures, all of which are held to be positive results in a Western society. The same is not true in Asian societies where high power distance and rigid hierarchies are the preferred organisational model and low individualism but high social interaction is the preferred personal role.

Table 2 gives some examples of applications of IT where the anticipated benefits (from a Western viewpoint) have not been realised in an Eastern environment and associates this with the cultural indicators which need to be present to support the effective use of the innovation.

IT Applications	Anticipated Benefits Achieved ?	Examples of Cultural Characteristic Preferences
COMMUNICATIONS		
Electronic Mail	x	low power distance, low context, public space
Voice Mail	√	high power distance, low codification, private space
Voice Response Systems	√	high power distance, high uncertainty avoidance
Videoconference	x	low power distance, high individualism, high active mode
www	x	high individualism, fast information diffusion, structured flow
Groupware	x	high individualism, low power distance, high universalism

Table 2. Achievement of Western benefits in Asian Contexts.

This is not to suggest that such technologies and approaches cannot be used in an Eastern context but, rather, that the systems implementer must be aware that a change has to be effected in the organisational culture before the innovation can produce the expected results. In some cases alternatives should be used which most suit the culture of the users in that area instead of enforcing global standards.

The Research Model.

It is obvious that some societies experience less difficulties in absorbing new business methods and accepting new technologies than others. reasons for this have been related to societal factors but there are also economic ones. Tung (1993) suggests that it is the interplay of a number of factors related to the economic stage of development; societal culture, organisational culture and the absorptive capacity of the recipient.

Figure 2 showed a model which can be used as a framework for information systems development. This is more graphically presented in Figure 4.

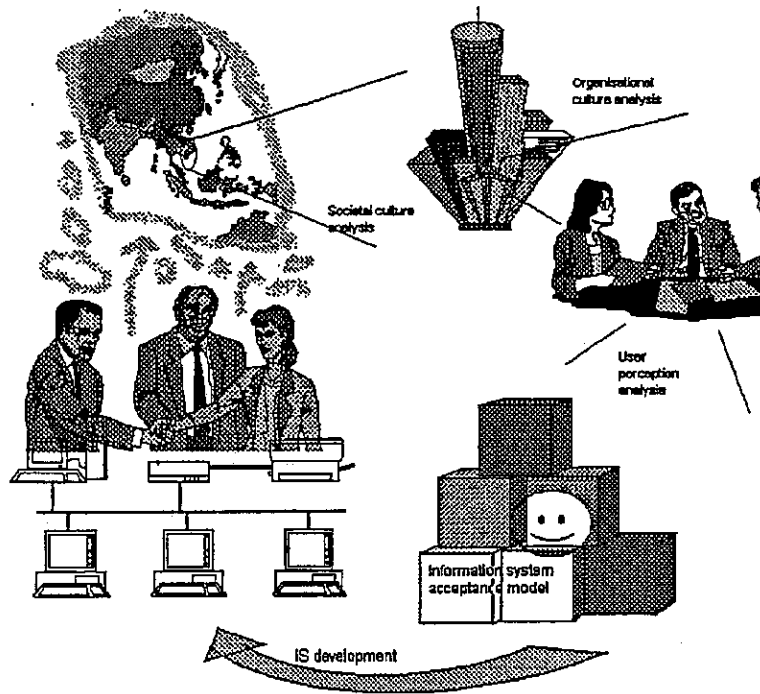


Figure 4. A Culture Based Framework for Information Systems Acceptance

Figure 4 represents the framework for the research study. We have not discussed in detail the analysis for information acceptance and institutionalisation as these are more familiar.

The first part of the study, however, will relate specifically to the ISAM and will be initiated in Hong Kong and Australia. The industries selected for study will also be identical and hence we hope to reduce the bias found in our survey to reflect differences related to cultural issues within the two societies, their organisations and their information acceptance models. The areas which will be examined first will relate to communications systems and IS applications and their perceived value now and in future strategies. It is intended to substantiate the assertions of Table 2, as well as to investigate the comparative adoption of executive information systems.

Conclusion.

The nature and role of information is central to the study of organisations, and, just as emphatically, the culture has a significant impact on organisational philosophy and information acceptance. The selection, analysis and design of information systems must therefore take into account both national and organisational culture to identify modes of information handling, processing and control which will be intimately involved with any IT innovation to be introduced.

Eastern culture differs significantly from Western, yet most of the management principles which are applied in international companies derive from Western principles and so may not relate to a different cultural environment. Cultural change does not imply a change to basic philosophy and, certainly not, a change from Eastern to Western ideals. It implies a process of socialisation, an understanding that there are many different views that make up a single world.

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