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Culture is the deepest and most deterministic aspect of human life. Cultural differences are the "ultimate determinants of human organization and behaviour" (Hofstede & Bond, 1988). The interpretaion of data, the use of information, the abilities to source and adopt technological innovations, and the enactment of organizational changes are all culture-dependent (Herbig & Miller, 1992; Jaegar, 1986; Shaw, 1990; Tricker, 1988). Organizational culture is somewhat malleable, but societal (or national) culture, based on deeply-embedded values, is very difficult to alter (Hofstede, 1980), and thus will constrain the transferability of management ideas (Doktor et al, 1991; Kedia & Bhagat, 1988).

The growing need to develop information systems which can be implemented internationally or even on a global basis makes it important to understand the impact of societal culture on IT management. Unfortunately, there has been little consideration to date of its influence on IS use or IT-enabled change efforts, like re-engineering. As a result, IT specialists are prone to assume universal formulas for successful practice and ignore the *messiness* of human factors (Baskerville & Smithson, 1995).

Hofstede (1980) reports on perhaps the most ambitious international study of cultural differences. Using a database with responses from about 116,000 employees in 50 countries, he delineated the following dimensions of societal culture: *power distance*, *individualism/collectivism*, *masculinity/femininity*, and *uncertainty avoidance*. This article considers the influence of these four dimensions on IS planning and implementation as well as IT-enabled organizational change. Cross-cultural propositions are offered and the Chinese business context is used to illustrate the differential effects of culture on IS management.

Power distance (PD) reflects the degree to which a society accepts a hierarchical system and unequal distributions of power. A high PD score implies greater status differences between superiors and subordinates. Managers tend to be autocratic and paternalistic while employees readily accept directives from above.

Hofstede (1980) found that Chinese social groups have much higher PD levels than their American counterparts. The Chinese consider it self-evident that all men are born *unequal*. The bases for this inequality include achievement, wealth and morality. The uneven distribution of power is both prevalent and accepted in Chinese society. Indeed, social stability hinges on preserving this hierarchy.

In the Chinese business culture, information is a personal asset rather than an organizational resource (Martinsons, 1994). As a result, most Chinese management information really is information *only* for managers. Data is largely maintained in a soft form - in the minds of top managers. Discretionary power is preserved by selectively releasing key information to subordinates and co-workers instead of widely sharing it among organizational members.

A formal IS can undermine social stability by giving *equal* information access to everyone. Although many Chinese businesses *have* installed computers, their major role is to monitor and control expanding operations (Burn & Martinsons, 1996; Redding, 1990). More generally, power and control reside in the ability to share or withhold information. In a high PD culture, information will be tightly held and IT will be used to reinforce management control. Meanwhile, low PD cultures will tend to promote the dissemination and sharing of information, using IT as an instrument to enable employee empowerment. From this,**Proposition 1a.** High PD cultures will use IT **more** to control than their low PD counterparts.

Proposition 1b. High PD cultures will use IT **less** to coordinate than their low PD counterparts.

The degree of PD will also affect IT-based change efforts. High PD cultures superiors extensively use conditional and ambiguous statements to preserve their power based on critical dependence and to maintain flexibility. The release of information which maintains and reinforces the *status quo* or promotes management control will be encouraged. Meanwhile, information which calls managerial decisions into question or, more generally, undermines stability will be suppressed. Thus,

Proposition 2. High PD cultures will find it **more** difficult to use *clean-slate* thinking in planning IT-enabled changes than their low PD counterparts.

High PD cultures are also less likely to codify data into simplified forms (as required by computerized databases), especially if its context is lost (Bond, 1991). They will rely more on personal and verbal forms of intra-organizational communication. Indeed, Chinese businesses will have fewer documents and less diffusion of information than similar-sized American counterparts. More generally, the concentration of authority in high PD cultures will moderate the need *and* the ability to share information. This implies that,

Proposition 3. High PD cultures will consider it **less** important to develop formal IS plans and process models than their low PD counterparts.

PD may also be expected to affect the nature of IT-enabled change. Hammer & Champy (1993) argue that top management must communicate a compelling rationale for re-engineering and oversee the effort. In a high PD culture, those in authority have an obligation to look after their subordinates, who reciprocate by obeying their bosses. Decisional prerogatives are thus concentrated at the top of the organization.

For example, Chinese managers are expected to give better instructions if they want to improve productivity (Bond, 1986). Just like parents, they explicitly direct their workers. Employees will follow the instructions they are given, but the outcomes of their work remain the responsibility of their boss. Centralized authority in a Chinese business makes it easier to dictate the initiation of a re-engineering effort; employees are unlikely to question changes recommended by their managers. Subordinates in high PD cultures will expect and accept directions from their superiors. As a result,

Proposition 4. High PD cultures will find it **less** difficult to <u>initiate</u> IT-enabled changes than their low PD counterparts.

In contrast to the initiation and planning stages, the effective implementation of IT-enabled changes, such as those resulting from *genuine* re-engineering, requires participatory management practices. Dynamic business environments favour delegated decision-making and increased information sharing. Substantial performance improvements are unlikely if key operational decisions are not made by those who are closest to the action. Teams or individuals must have the skills and self-confidence to accept responsibility as well as the power and information to initiate and regulate their own work. Timely and complete IS outputs can facilitate high-quality outputs.

Managers must trust subordinates and delegate authority if the redesigned business model is to be effectively implemented (Hammer & Champy, 1993). This would represent a radical and *unnatural* change in a high PD culture. It would tamper with well-defined and widely-accepted roles and potentially create instability. As a result, the transformation from a hierarchical control structure to a flat coordination and coaching structure may be resisted by managers *and* employees. Managers will not want to relinquish their positional power and control while workers will hesitate to assume the risks associated with independently initiated actions. Therefore,

Proposition 5. High PD cultures will find it **more** difficult to <u>effectively implement</u> IT-enabled changes than their low PD counterparts.

Individualism/collectivism reflects the degree to which a society values independence versus group membership. Individualistic (IN) societies stress personal goals and initiative, autonomy and privacy.

Unilateral decisions are favoured. In collectivistic (CO) societies, people are integrated into strong and cohesive groups, whose members tend to look after each other. Affiliation, loyalty and group decisions are all very important.

Hammer & Champy (1993) note that after an organization has been re-engineered, workers or case teams "make decisions" (p.53) and work units change to process teams, which are "groups of people working together to perform an entire process" (p. 65-66). Based on their attributes,

Proposition 6. CO cultures will find it **less** difficult to work in teams after making IT-enabled changes than their IN counterparts.

Loyalty to the group, commitment to its norms, involvement in its activities and a high level of socialization are also typical of CO cultures. Although individual rewards for outcome-based performance fit IN cultures, team rewards for loyalty and conformity are more suitable for a CO culture (Hofstede, 1980). Although IT facilitates the collection and analysis of more objective and tangible performance measures, CO societies (like the Japanese and Chinese) still make extensive use of *personal* rather than *professional* performance management (appraisal and reward) systems. Staff assessment in CO cultures emphasizes loyalty and obedience rather than explicit outcomes. This muddles the relationship between individual contributions and rewards and also conflicts with Hammer & Champy (1993, p. 72), whose advice is to focus performance measures and compensation on results. This implies that,

Proposition 7. CO cultures will find it **more** difficult to implement IT-enabled performance management systems than their IN counterparts.

Masculinity reflects the degree to which a society defines achievement in terms of success and the acquisition of money or material possessions. Masculine (MA) cultures favour assertive behaviour and optimize results, even at the expense of harmony. It is not surprising that performance-driven, IT-enabled change efforts, such as re-engineering, have become very popular in the highly masculine American culture. In contrast, feminine (FE) societies emphasize caring and nurturing behaviour. Achievement is defined in terms of human contacts and the quality of the living environment. FE cultures will seek to preserve harmony even if sub-optimal decisions must be made. Following from this,

Proposition 8a. FE cultures will place **less** emphasis on economic and technical impacts of IT than their MA counterparts.

Proposition 8b. FE cultures will place **more** emphasis on the social impacts of IT than their MA counterparts.

Hammer & Champy (1993) also emphasize the need to create a disequilibrium in order to dramatically improve performance. This conflicts with the FE preference for friendly work environments, co-operation (rather than conflict) and security. Movement and tranquillity are also considered to be complementary in the Chinese culture, occurring in a constant ebb and flow (*yin* and *yang*). The fears of losing face and disturbing nature will dissuade disruptive changes in policies and practices. More generally, FE cultures will favour changes which promote social harmony and stability, and frown on assertive behaviours. Thus, **Proposition 9a.** FE cultures will be **less** likely to use revolutionary and sudden forms of IT-enabled change than their MA counterparts.

Proposition 9b. FE cultures will be **more** likely to use evolutionary and gradual forms of IT-enabled change than their MA counterparts.

Uncertainty avoidance reflects the degree to which a society tolerates ambiguous situations. High uncertainty avoidance (UA) cultures tend to depend on rules and regulations to clarify expectations and reduce risk. Pronounced fears of random events and the unknown will encourage managers to plan for and

try to control the future. In contrast, low UA cultures see environmental change as inevitable and focus on adapting to it.

Americans tend to perceive situations as problems to be solved or opportunities for improvement while the Chinese tend to accept the situation (Hsu, 1970). A strong Chinese belief in fatalism moderates the need for business forecasts and detailed plans. More generally, low UA cultures will adapt to environmental changes rather than attempting to influence them. Thus,

Proposition 10. Low UA cultures will consider it **less** important to plan for IT-enabled changes than their high UA counterparts.

Managers in low UA cultures tend to use informal and personal contacts as well as intuition (rather than analysis) to understand their environment. Universal rules and programmed algorithms are also perceived to be overly rigid and insensitive to changing circumstances, and so flexible rules and commitments are favoured. For example, the Chinese continue to rely on the *rule of man*, with wise and compassionate judges, rather than the *rule of law* (Bond, 1986; Hsu, 1970). As a result,

Proposition 11a. Low UA cultures will make **less** use of IT to *program* decisions or actions than their high UA counterparts.

Proposition 11b. Low UA cultures will make **less** use of IT for accounting and control than their high UA counterparts.

Societal culture can have a substantial impact on IS planning and implementation. Cultural values will influence how individuals and groups perceive events and situations, and in turn their views on the way IT should be used and the type of IT-enabled change (if any) that is necessary. Behaviours during the IT-enabled change process may also be expected to preserve and venerate the existing culture. Thus, the potential rewards from successful IT-enabled change need to be weighed against the risks, including those stemming from the need to *challenge* and *disturb* existing norms.

IS managers must take account of the prevailing culture. Many IT-enabled changes that are otherwise feasible may be impeded by cultural factors. Changes which promote information sharing or delegate authority will be inappropriate where information is the dominant source of power while revolutionary changes will not fit cultures which value stability and harmony.

The full-length paper with references is available upon request from the first author.