

Cultural Aspects of IS in China

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Abstract

There are quite a number of published papers dealing with impacts of Chinese culture on IT practices. Although they contribute to a better understanding of the phenomenon, their findings are fragmented and not systematic. The aim of this paper is to address this inadequacy by contributing to a fuller picture. We do an exhaustive literature study of published referred papers in this area. We use the framework of Martinsons and Hempel (1998) to characterize Chinese culture, namely, harmony maintenance, collectivist, hierarchical, uncertainty tolerance, conservative on change, and intuitive decision style. We use these six dimensions to structure the findings of our literature study.

Key words: Chinese culture, impacts, IS practices

Introduction

China and the rest of the world share similar critical successful factors in most of the IS practices (Mao, 1999; Shanks, Parr, Hu et al., 2000; Li, Zhang and Zhang, 2003). However, the process of IS implementation and its subsequent use differ substantially (Davison, 2002; Li et al., 2003). One very important reason to explain the uniqueness of China's IS practices is culture. However, culture is a challenging research topic due to the multiple and divergent definitions (Leidner and Kayworth, 2006) and the complicated ways it operates at organizational, group and individual levels. The study of Chinese culture is particularly difficult, in part because Chinese culture has been influenced greatly by western culture recently as a result of globalization.

Current IS researches about China do pay due attention to the cultural aspects when dealing with the uniqueness of China, e.g. in ERP implementation (Davison, 2002), E-business adoption (Antonis, Stephanie and Pamela, 2003; Bin, Chen and Sun, 2003; Loiacono and Lin, 2003), knowledge management (Wei, 2007), information process and sharing (Steinwachs, 1999; Zhao, Lai and Young, 2002). The discussions, although contributing to a better understanding of the influences of Chinese culture in IS practices,

are fragmented and not systematic. The aim of this paper is to address this inadequacy by contributing to a fuller picture of the impacts of Chinese culture on IS practices.

We propose to do so by aggregating, summarizing and analyzing previous insights based on an exhaustive literature study. We look at 74 articles about Chinese culture and IS practices that have appeared in international journals and conference proceedings from 1998-2007. We then use a framework of culture analysis for IS to organize and aggregate the findings of these articles. By so doing, this paper contributes to a more nuanced and sophisticated understanding of an important issue in IS practice in China. To the best of our knowledge, this is the first paper which carries out an exhaustive review of literature of impacts of Chinese culture on IS practices and supplements the findings of the review with input from experienced practitioners.

The rest of this paper is structured as follows. Section 2 introduces an analysis framework for systematic presentation and analysis of impacts of Chinese culture on IS practices. Section 3 gives a description of our research method. It is followed by the longest part of this paper, the literature analysis of Chinese culture impact on IS practice. Insights extracted from the analysis are in Section 5. The last section concludes the paper.

A Framework of Culture Analysis

This study of cultural aspect of IS in China, using the classification scheme of Leidner and Kayworth (2006), is focusing on a national culture level, rather than on organizational and subunit levels. An analysis framework then is required to discuss national culture impact on IS practices. Although national culture research in IS has yielded many published works, there is no standard framework of analysis.

The most often used framework is the Hofstede's five culture dimensions, power distance, uncertainty avoidance, individualism vs. collectivism, masculinity vs. femininity and long-term vs. short term (Steinwachs, 1999; Huang, Lu and Wong, 2003; Singh, Xhao and Hu, 2003). About 60% of culture researches adopt one or more dimensions of Hofstede's framework even if it has been criticized as being difficult and incomplete (Ford, Connelly and Meister, 2003). Some studies add one new dimension or revise this framework slightly in order to update or extend this framework for new culture context, like high-context vs. low-context (Burn and Saxena, 1993; Calhoun and Teng, 2002), openness vs. conservativeness on system implementation (Quan, Hu and Wang, 2005).

In IS literature, a recent work is Leidner and Kayworth (2006) which reviews the culture in IS research by separating IS practices into four dimensions, namely, IS development, IT adoption and diffusion, IT use and outcomes, IT management and strategy. A literature review of cultural impact on these four dimensions is performed, and IT's influence on culture and IT culture are also explored.

Chinese native scholars have published some studies about the Chinese culture impact on IS practices in Chinese journals. The frameworks used tend to be explicit and intuitive.

For example, Chen and Liu (2002) analyze the culture from top management level, employee level and technology level. Wu and Li (2005) explain the possible conflicts between ERP philosophy and Chinese culture from three aspects: centralization and decentralization, collaboration and egoism, innovation and conservation. And Liu (2006) discusses the appropriate cultural environment that IS implementation needs from the perspectives of coordination, innovation, collectivism, and job ambiguity.

For our purpose, the most relevant framework is the one developed by Martinsons and Westwood (1997) in their study of MIS in Chinese business culture. They find that Chinese culture is shaped by paternalism, personalism and high context communications based on Confucianism. This framework is revised by Martinsons and Hempel (1998) in a study of Chinese business process reengineering. In it they compares Chinese culture and American culture along eleven dimensions: 1) social philosophy, 2) decision-making, 3) relationship to nature, 4)time orientation, 5) individualism, 6) power distance, 7) uncertainty, 8) communications, 9) expression, 10) basis of trust, 11) information flows.

Based on the framework of Martinsons and Hempel(1998)(see appendix A), we characterize Chinese culture as harmony maintenance, collectivist, hierarchical, uncertainty tolerance, conservative on change, and intuitive decision making style. We use this framework in analyzing the 74 selected papers. At the same time, we wish to seek support or counter evidences from the papers for these characteristics.

Table 1. Analysis framework of Chinese culture

Dimension	Attributes
Relationship to the environment	Harmony maintenance
	<i>Guanxi</i> and face oriented / personal trust/ indirect expression/ people are born unequal
Fundamental social units	Collective
	Family oriented/ Individualistic collectivist
Management structure	Hierarchical
	Long power distance/ bureaucratic and centralized/ high information control/ top-down directives and bottom-up report
Uncertainty tolerance	High
	Adapt to uncertainty
Attitudes to change	Conservative
	Respect and preserve tradition/ passive
Decision making approach	Intuitive and non-rule-based approach
	Flexible and holistic intuition/ high context

Source: Martinsons and Hempel (1998)

Research methodology

We search for papers in international refereed journals and conferences instead of domestic Chinese journals. The main reason for this choice is that the articles in referred international journals and conferences are usually supported by more rigorous research methodology and formal research process, their conclusions tend to be solid and robust,

while the IS researches in China are usually descriptive and conceptual (Zhang, Huang and Yu, 2006; Ji, Min and Han, 2007) and lack sufficient peer review before publishing.

We adopt a two step method. First, we search the China related topic in IT/IS journals and conferences. We target 125 IT/IS journals ranked by AIS (Association for Information Systems), which automatically limits the scope of articles into IT/IS field. After a preliminary screening, 36 journals are identified with at least one paper studying IS topics about China. We also choose four well known international conference proceedings, AMCIS, PACIS, ECIS and ICIS to keep track of the latest IS research findings about China. After eliminating duplications, a total of 162 articles are retrieved for analysis. Next, we examine these articles in full text to check if any analysis or conclusions are related to Chinese culture. Seventy-four articles are found to be related to our topic, which is organized as appendix B. We then excerpt each of their findings or conclusions, and code them under corresponding items specified in analysis framework. Two rounds of excerpt are done by one of authors and a research assistant in one excel sheet to ensure the completeness of contents.

Literature Analysis

The Confucian based characteristic of Chinese culture is well recognized by the world, despite being periodically criticized and reinterpreted (Shin, Ishman and Sanders, 2007). It remains "the most apposite single-word label for the values which govern Chinese social behavior, while the Confucian doctrine still has a far-reaching influence on the common culture and psychology of the Chinese nation" (Redding, 1990). With the belief that Confucian based culture is ingrained in mindsets of Chinese people even though the setting is modernizing, we hope we can find out some special features of Chinese IS practices in above mentioned six dimensions through literature analysis.

Harmony Maintenance

Generally speaking, Chinese people are more likely to adapt or respect the external environment since Confucianism considers all men are born unequal (Liang, Xue, Byrd et al., 2004), and the respect of the status can help in keeping a harmonious society (Martinsons and Hempel, 1998; Avison and Malaurent, 2007). *Guanxi* and face (Social Image) oriented coordination approach is the main approach to maintain the harmony.

From the positive aspect, *guanxi* network is widely utilized to minimize the transaction cost in China (Lai, Humphreys and Sculli, 2001). For example, *guanxi* plays a particularly critical role in both in-group and external information sharing (Steinwachs, 1999; Shin et al., 2007). In the research of ecommerce, the good *guanxi* can enable success in ecommerce over the unfavorable regulatory, financial and logistics issue in China (Martinsons, 2002). Trust in China is mostly established through interpersonal similarity or relationship (Zucker, 1986), since the institutional-based trust is relatively difficult to build in China (Li et al., 2003; Loiacono and Lin, 2003).

Guanxi can also be used to explain the informal and implicit forms of communication. The Chinese prefer to transfer knowledge through interpersonal contact rather than through formal and/or written means. This informal way inhibits codification and restricts

information access in IS practices like knowledge management (Burrows, Drummond and Martinsons, 2005) and data exchange in B2B (Martinsons, 2002). It also results in less formal planning and documentation in China (Martinsons and Hempel, 1998), since they believe informal personal coordination is more important than formal document or contract (King and Bu, 2003). These are the negative aspects of *guanxi*. In recent years, however, China has devoted more resources to strengthen the institutions (Carney, 1999; Weidenbaum, 2006). This trend is making *guanxi* less significant. The diffusion of Western-style business practices among Chinese organizations is also weakening the significance of *guanxi* (Kshetri, 2007).

Harmony also includes preserving “face” for Chinese people. Sense of social image in front of another person is perceived as critical for many in China. As mentioned by (Lu, Yu, Liu et al., 2003), it is understandable that young people or executive class own latest electronic products as new fashion items to show off. Face can be an effective incentive for Chinese company to compete on IT initiatives and struggle to be a model (Qu and Zahedi, 2003), which increases “face” greatly. But the negative part is the fear of losing face and undermining harmony which will dissuade many Chinese leaders from initiating rapid or radical changes (Martinsons and Revenaugh, 1998). In a study of knowledge management, the desire of both managers and employees to avoid conflict and loss of face is used to explain the low adoption rate of knowledge management in China (Davison, 2002).

Moreover, in order to maintain harmony, Chinese people refrain from speaking out their opinion in public, which is one of the reasons why SMS is so popular in China (Wang and Yuan, 2006). Many clerical staff at the bottom of the hierarchy in Chinese organizations feel much safer if they are told what to do and what is expected (Burrows et al., 2005). So very often, the employees are not actively involved in the IT project, and always say “yes” when they are required to do something, although Asian ‘yes’ may not be as frank and wholehearted as it is assumed by westerners (Avison and Malaurent, 2007). The compliance of Chinese people is also partly influenced by the government, who encourages the release of information that promotes conformity and harmony and suppresses the information that undermines social stability (Xue, 2005; Tan, Tyler and Manica, 2007). Therefore, Chinese have stronger motivation to comply with normative beliefs, and are less inclined to face challenges than their western counterparts (Qu and Zahedi, 2003).

From the above analysis, although the importance of *guanxi* in China has declined in modern society, the idea that Chinese culture is a harmony keeper is still supported in the literature studied.

Collectivist

Chinese culture is a collectivist culture which stresses the interdependence and long-term mutual obligations between individuals and organizations (King and Bu, 2003). People are expected to follow group values and initiatives (Triandis., 1995). As found by (Lai et al., 2001) in the study of western ecommerce diffusion in China, Chinese people prefer

small group based operations with emphasis on long-term relationship, inter-organizational collaboration and re-negotiation. Another ecommerce study (Singh et al., 2003) also indicates that collectivist features like clubs, chat rooms and family themes have a higher percentage occurrence on Chinese websites than on US domestic websites.

Chinese collectivism, however, differs substantially from those prevailing in other Asian countries (Martinsons and Westwood, 1997). They are individualistic collectivism (Li et al., 2003) where small group or family value is emphasized, rather than society oriented (Martinsons and Revenaugh, 1998). In contrast to Japanese society, which may be considered as a block of granite, the Chinese resembles a tray of loose sand, where every grain is a family (Fukuda, 1983). This opinion is consistent with the finding of Martinsons and Westwood (1997) that the Chinese power structure is perhaps best represented by a series of concentric circles or “family” with the patriarch in the center. The traditional family values are emphasized in this circle.

The Chinese collectivism can be either an inhibitor or enabler of IS practices. For example, a positive relationship between collectivism and attitude toward information sharing is found by (Bendoly, Bachrach, Wang et al., 2006; Shin et al., 2007). Their finding suggests that enthusiasm in-group connectedness and cooperation can be a positive mediator to increase firm’s ERP capability. Collectivism is also found to facilitate the usage of ICT in China because the resource sharing within groups (Xiao, Huang and Umapathy, 2005). But in-group relationship is difficult for outsiders to access, and it in turn inhibits the collaboration with other groups. For example, (Kunnathur and Shi, 2001; Li et al., 2003) find that most information gathered and processed in Chinese environment is intended to support the top managers of various small circles, which results in many independent systems and data that are hard to integrate or share. In addition, considerable socio-cultural tensions existing among circles also inhibit the adoption and diffusion of eCommerce (Lam, Lee, Wong et al., 2005; Kshetri, 2007; Tan et al., 2007). Such behaviors actually make Chinese collectivism a negative factor in ERP implementation. These findings suggest that the merits of Chinese collectivism need to be appropriately leveraged.

From above analysis, Chinese collectivism may be seen as individualistic collectivism.

Hierarchical power structure

Chinese management philosophy is characterized by centralized authorities as well as directive and hierarchical structures (Qu and Zahedi, 2003) due to the long power distance (Mao, 1999) and paternalistic tendency (Martinsons and Westwood, 1997). The position of top management in Chinese business is overwhelming. No other “champion” is needed because such a champion would be seen as a challenge to the authority of top management, which often leads to power conflicts (Shanks et al., 2000; Li et al., 2003; Martinsons, 2004). And both top managers and lower level staffs are not comfortable with empowerment because they are accustomed to the practice that key decisions are made by top management (Martinsons and Revenaugh, 1998). It is also natural that Chinese business leaders use their authorities to facilitate modifying subordinates behaviors in change management (Martinsons and Hempel, 1998).

Unfortunately, Chinese top managers do not appear to realize the importance of IT and IT management. Consequently, they commit less on IT management (Xue, Liang, Laosethakul et al., 2003; He, 2004; He and Brown, 2005). Problem arise when Chinese managers rarely accept knowledge input from their subordinates (Li et al., 2003), and when the IT decisions by top management are seldom made with due consultation with end users (Shanks et al., 2000). This may be helpful to speed up IT decision and IT implementation, but such bureaucratic and arbitrary organizational culture is seem as one important cause of IT project failures (Sia and Ou, 2004; He and Brown, 2005).

The hierarchy management structure also helps to explain the correlation between power and information in China. Information control is one of the predominant sources of power in China. Critical information in China is selectively preserved instead of being distributed widely. Information is often treated as an individual property (Davison, 2002) and critical information controlled by individual can be used to preserve discretionary power in Chinese organization (Martinsons and Revenaugh, 1998; Dologite, Mockler, Bai et al., 2004). It is quite obvious in e-government practices in China where branches of government purposely hold back some information and obstruct large-scale information sharing in order to keep their power and interests (Hu, Lin, Li et al., 2003). Because implementation of IS is usually accompanied by information sharing, China's managers are worried about their "unique" business practices being revealed in the process (Kunnathur and Shi, 2001; Xue et al., 2003). This has significant implication for IS practices, for example when information sharing needed by IS is misaligned with the survival strategy undertaken by organization and individuals (Hsiao, Li and Chen, 2005).

Aside from two implications for IS practices mentioned above, the hierarchy management structure also results in some unique requirements for IS products. For example, reports are often necessary in the bureaucratic societies for government departments and agencies, as well as internal process review and control procedures (Davison, 2002). The information systems with flexible data or reports generator would be welcome by China's managers to increase their power (Dologite, Fang, Chen et al., 1998). And China's managers place great emphasis on information security because of the importance of information for the power (Li, Huang and Sha, 2005).

We may summarize from this discussion that the hierarchical management structure in China is still there. The power structure and the role of top management are hard to shake, even with the influence of western management philosophy.

Uncertainty tolerance

Uncertainty tolerance is the extent a person feels comfortable in unstructured situations. It is commonly accepted that there are two different cultures, namely, uncertainty avoiding culture and uncertainty accepting culture. The former tries to minimize uncertainly by taking strict laws and regulations, or risk control measures. The later tolerates ambiguous situation, and tries to live peacefully with it.

The research findings about uncertainty tolerance in China in our literature study are conflicting. Shanks et al(2000) claims that “uncertainty avoidance is a key element of Chinese society... in the Chinese context improving data accuracy would be considered to be part of the process of uncertainty avoidance”. And Singh et al (2003) finds that the overall frequency of the occurrence of uncertainty avoidance was relatively higher in Chinese websites than in the US domestic websites.

The majority of the studies, however, argue that the Chinese culture is uncertainty tolerant. Martinsons (1997) and Lam et al(2005) show that East Asians, especially Chinese people are more comfortable with unclear information. This corresponds with the informal communication path among Chinese that relies more on personal experience. They keep more information among themselves (Lam et al., 2005), rather than explicitly express it. It is common in China that you need to guess the “true” meaning of conversation beside the surface information, because Chinese people like to use allusion to tell something they think you should know and would understand.

Based on authors’ own understanding about uncertainty tolerance as native Chinese, the uncertainty avoidance mentioned in the literature is mainly because of the importance of information for the power (see the discussion of hierarchical management structure), rather than unable to tolerate the uncertainty. So the idea that Chinese culture is uncertainty tolerant is supported.

Conservative on change

Contrary to the traditional thinking that Chinese people are more conservative in regard to change, the literature demonstrates that Chinese people’s attitude seems to be more positive toward change and towards new technology when they come to experience it. Both Collis (1995) and Brown et al(1998) conclude that people from China hold more positive attitudes on change and new technologies than those from countries that they compare, namely, UK, US and Japan. And in Antonis et al(2003)’s exploratory research, respondents “have a strong positive attitude toward implementing and using ecommerce applications” in China. This phenomenon may be the result of opening up in the past three decades, the time when Chinese people are accustomed to kinds of change happening in regulation system, management method, environment, etc (Qu and Zahedi, 2003). And in the Chinese organization, change management may not be as important as it is imagined, “change is accepted if it is demanded.” (Shanks et al., 2000). This is partly because people are used to change, and partly because Chinese people are more compliant.

But when the change is really coming and needs to be adapted to, the resistance of Chinese people is widely observed as in ERP implementation (Reimers, 2003; He and Brown, 2005; Avison and Malaurent, 2007), they will use *guanxi*, power, or other approaches to stop the IS implementation. One possible reason is that Chinese people don’t like drastic changes happening so fast. Chinese culture values heritage or continuity and favors evolutionary rather than revolutionary change. Thus although Chinese people have no difficulty accepting change, the change should be mild, stepwise, rather than radical, disruptive and rapid (Martinsons and Hempel, 1998)

Therefore, the idea that Chinese culture is conservative on change is partly supported. Chinese people actually hold positive attitude toward change, but they are used to mild changes rather than abrupt turn.

Intuitive Decision Making

The way that Chinese people make decisions or solve problems is relatively unstructured compared with westerners as indicated by Burrows et al(2005) in their research: “the Chinese’s decisions are comparatively implicit, relying on analogical and correlative thinking, rather than on rational and analytic thinking”. Although Chinese managers refer to information or data to support decision making process, only a few data analysis is used even when deciding the most important issues (Li et al., 2005; Bendoly et al., 2006). The *entrepreneurial model* of strategy making that relies on personal knowledge and intuition rather than objective criteria or formal and quantitative method is dominant in Chinese decision making (Martinsons and Hempel, 1998). Therefore, “the decision making process usually involves few people and takes short time to make” (Martinsons and Westwood, 1997).

Another trend of decision making in China is that senior managers rarely let subordinates make a meaningful contribution to the decision-making process, they prefer to rely on trusted external advisors to analyze and interpret the external environment (Burrows et al., 2005), since they want to keep the centralized decision making decisive, and thus are reluctant to share the contribution of appropriate decision with subordinates. This trend is witnessed in many studies (Hsiao et al., 2005; Thatcher, Foster and Zhu, 2006), which is consistent with the findings of hierarchical management structure.

The decision making of Chinese people is also characterized to be highly contextual. Regulation and rules may play important role in directing the decision, but in most situations, Chinese people like to adopt “the individual-policy-for-individual-issue approach” (Xue, 2005), which means that the executors of rules usually can find some room for themselves to make flexible decisions.

The findings on decision making process as uncovered in the 74 articles are consistent and they strongly support the view that decision making culture in China is not based on rules, rather based on intuition.

Insights from literature study

Contrary to some studies that claim Chinese culture is largely negative to IS practices (Bin et al., 2003); (Martinsons and Westwood, 1997; Martinsons and Hempel, 1998), we find that the actual picture is more complex. Chinese culture can be positive or negative to the implementation of IS depending on how it is managed.

(1)In the dimension of harmony: *guanxi* based harmony can be used as a tool to overcome the bureaucratic hurdles and to reduce the transactional costs in IS practices. And “face” (social image) based harmony can be used as an incentive to push the IS

adoption and diffusion. The negative aspect is like low codification and openness in communication, the need to preserve face. These are issues that should be addressed when we implement IS in China.

(2) In the dimension of collectivist behavior: if we can appropriately handle it, the in-group connection can be utilized to enhance the learning capability and increase the work productivity of group. But we need to keep in mind that family or small group oriented collectivism can evolve into a series of autonomous circles that hamper the collaboration within the organization. Some measure should be taken to prevent the emergence of high degree of collectivism.

(3) In the dimension of hierarchical management structure: Operating in such hierarchical culture, IS applications that are consistent with directive rather than participative management are more likely to work in Chinese organization. Because power held by top management is comparatively greater in China, some attention should be paid to how to get top managers to commit themselves to IS activities, and use their power to promote IS activities. It is essential to establish appropriate IT governance mechanism to reduce the possible risks caused by arbitrary actions of top managers. An open information culture should be encouraged in companies to address the issue of over-protection of information by employees in China.

(4) In the dimension of uncertainty tolerance: Chinese people on the whole can tolerate inaccurate data or information because they are more dependent on personal relationship and experience. This results in ambiguity in various IS processes. When implementing IS in China, it is necessary to persuade managers to use formal business planning tools and increase data precision.

(5) In the dimension of conservative attitude on change: the 74 papers provide some evidence to suggest that Chinese people are more positive to change than it is generally perceived. However, change should be better managed to help the Chinese people adapt to new environment in the interest of a smooth transition.

(6) In the dimension of decision making: Chinese people tend to use intuition and experience rather than rational and systematic thinking. The decision is made by using limited information. It can speed up the decision process but reduces the use of IS which provides formal data analysis. Some improvements and incentives should be made to encourage people making more scientific decision.

Conclusion

A comprehensive understanding of Chinese culture impact on IS is presented by this study, which is helpful to those interested in conducting China related IS research. This study also contributes to the body of knowledge on culture research by examining the received opinion about Chinese culture. It is interesting to note that there is a change in Chinese attitudes toward change recently.

Instead of repeating the main findings of this short paper, perhaps it is more interesting to suggest some areas for future research. First, this paper assumes culture as a relatively stable environment factor, and we examine only the impacts of Chinese culture on IS practices. How does the use of some pervasive IT tools affect Chinese culture in general and organizational culture in particular? Second, how has business culture been influenced by western management culture and how this new culture has impacted IS practices? Third, one can design a number of in-depth case studies by using Table 2 as a rough guide to tease out how skilful IS managers and project leaders deal with the subtle yet important roles of culture in enhancing or disrupting the potential contributions of IS to organizational goals. Fourth, given that Chinese culture is not monolithic (encompassing Confucianism, Daoism, Buddhism and modern Western culture), to what ways can a skilful IS manager draw on different aspects of Chinese culture to tackle problems arising out of different aspects of IS practices.

Reference

- Antonis, C. S., S. R. Stephanie, et al. (2003). "Perceptions and attitudes about eCommerce development in China: An exploratory study." *Journal of Global Information Management* **11**(2): 31.
- Avison, D. and J. Malaurent (2007). "Impact of cultural differences: A case study of ERP introduction in China." *International Journal of Information Management* **27**(5): 368-374.
- Bendoly, E., D. Bachrach, G., et al. (2006). "ERP in the minds of supervisors." *International Journal of Operations & Production Management* **26**(5): 558.
- Bin, Q., S.-J. Chen, et al. (2003). "Cultural differences in e-commerce: A comparison between the U.S. and China." *Journal of Global Information Management* **11**(2): 48.
- Burn, J. K. and B. C. Saxena (1993). "Critical issues of IS management in Hong Kong: A cultural comparison." *Journal of Global Information Management* **1**(4): 28.
- Burrows, G. R., D. L. Drummond, et al. (2005). "KNOWLEDGE MANAGEMENT IN CHINA." *Communications of the ACM* **48**(4): 73-76.
- Calhoun, K. J. and J. T. C. Teng (2002). "Impact of national culture on information technology usage behaviour: an exploratory study of decision making in Korea and the USA." *Behaviour & Information Technology* **21**(4): 293-302.
- Carney, C. P. (1999). "The (Not So) Long March? China's Pace of Change." *Asian Affairs, an American Review* **25**(4): 236-48.
- Chen, C. H. and X. Y. Liu (2002). "Culture behavior Research in MIS." *Science and Scientific technology Management(in Chinese)*(11).
- Collis, D. and C. Montgomery (1995). "Competing on Resources." *Harvard Business Review* **73**(4): 118-28.
- Davison, R. (2002). "Cultural Complications of ERP." *Communications of the ACM* **45**(7): 109-111.
- Dologite, D. G., M. Q. Fang, et al. (1998). "An information systems view of Chinese state enterprises." *The Journal of Strategic Information Systems* **7**(2): 113-129.

- Dologite, G. D., J. R. Mockler, et al. (2004). "IS Change Agents in Practice in a US-Chinese Joint Venture." *Journal of Global Information Management* **12**(4): 1.
- Ford, D. P., C. E. Connelly, et al. (2003). "Information Systems Research and Hofstede's Culture's Consequences: An Uneasy and Incomplete Partnership." *IEEE Transactions on Engineering Management* **50**(1): 8.
- Fukuda, K. J. (1983). "Japanese and Chinese management practices: Uncovering the differences." *Mid-Atlantic Journal of Business* **21**(2): 35-44.
- He, L. and D. Brown (2005). *The Adoption of ERP Applications in China*. Americas Conference on Information Systems.
- He, X. (2004). "The ERP challenge in China: a resource-based perspective." *Information Systems Journal* **14**(2): 153-167.
- Hsiao, R., Y. Li, et al. (2005). *Technology Transfer in Cross-national Context: Experiences of an Online Market Failure in Chinese Food Industry*. Pacific Asia Conference on Information Systems.
- Hu, H., Z. Lin, et al. (2003). *From Concept Towards Implementation: E-Government in China*. Americas Conference on Information Systems.
- Huang, L., M.-T. Lu, et al. (2003). "THE IMPACT OF POWER DISTANCE ON EMAIL ACCEPTANCE: EVIDENCE FROM THE PRC." *Journal of Computer Information Systems* **44**(1): 93-101.
- Ji, S., Q. Min, et al. (2007). "Information Systems Research in China: An Empirical Study." *Journal of Global Information Management* **15**(1): 1.
- King, R. and N. Bu (2003). *The Psychological Contract Comparison between USA and Chinese IT Professionals*. Americas Conference on Information Systems.
- Kshetri, N. (2007). "The Adoption of E-Business by Organizations in China: An Institutional Perspective." *Electronic Markets* **17**(2): 113-125.
- Kunnathur, A. S. and Z. Shi (2001). "An investigation of the strategic information systems planning success in Chinese publicly traded firms." *International Journal of Information Management* **21**(6): 423-439.
- Lai, M. K., P. K. Humphreys, et al. (2001). "The implications of Western electronic commerce for Chinese business networks." *Industrial Management & Data Systems* **101**(5/6): 281.
- Lam, J., M. Lee, et al. (2005). *A Digital Inclusive Society Study: Understanding the Social Impacts of Information Communication Technology (ICT) Usage in China*. European Conference on Information Systems.
- Leidner, D. E. and T. Kayworth (2006). "REVIEW: A REVIEW OF CULTURE IN INFORMATION SYSTEMS RESEARCH: TOWARD A THEORY OF INFORMATION TECHNOLOGY CULTURE CONFLICT." *MIS Quarterly* **30**(2): 357-399.
- Li, D., W. Huang, et al. (2005). *Key Issues in Information Systems Management: A China's Perspective*. Pacific Asia Conference on Information Systems.
- Li, Q., Y. Zhang, et al. (2003). *Influencing factors of securities e-commerce in China*. European Conference on Information Systems.
- Liang, H., Y. Xue, et al. (2004). "Electronic data interchange usage in China's healthcare organizations: the case of Beijing's hospitals." *International Journal of Information Management* **24**(6): 507-522.

- Liu, Y. H. (2006). "The impact of firm culture on Information System Implementation." *Scientific Information Development and Economy*(in Chinese) **15**(16).
- Loiacono, E. and H. Lin (2003). Website Quality: A Cross-Cultural Comparison of United States and China Business Customers. Americas Conference on Information Systems.
- Lu, J., C.-S. Yu, et al. (2003). Acceptance of Wireless Internet via Mobile Technology in China. Americas Conference on Information Systems.
- Mao, E. (1999). Information Systems Success Factors In China. Americas Conference on Information Systems.
- Martinsons, M. and L. Revenaugh (1998). IT-Enabled Strategic Change in the Chinese Business Culture. Americas Conference on Information Systems.
- Martinsons, M. G. (2002). "Electronic commerce in China: emerging success stories." *Information & Management* **39**(7): 571-579.
- Martinsons, M. G. (2004). "ERP in China: ONE PACKAGE, TWO PROFILES." *Communications of the ACM* **47**(7): 65-68.
- Martinsons, M. G. and P. S. Hempel (1998). "Chinese Business Process Re-engineering." *International Journal of Information Management* **18**(6): 393-407.
- Martinsons, M. G. and R. I. Westwood (1997). "Management information systems in the Chinese business culture: An explanatory theory." *Information & Management* **32**(5): 215-228.
- Qu, Y. and F. Zahedi (2003). E-Commerce Adoption by Small and Medium-Sized Enterprises in China: The CEO Perspective. Americas Conference on Information Systems.
- Quan, J., Q. Hu, et al. (2005). "IT IS NOT FOR EVERYONE IN CHINA." *Communications of the ACM* **48**(4): 69-72.
- Redding, S. G. (1990). *Spirit of Chinese Capitalism*. New York, de Gruyter.
- Reimers, K. (2003). "IMPLEMENTING ERP SYSTEMS IN CHINA." *Communications of AIS* **2003**(11): 335-356.
- Shanks, G., A. Parr, et al. (2000). Differences in Critical Success Factors in ERP Systems Implementation in Australia and China: A Cultural Analysis. European Conference on Information Systems.
- Shin, S. K., M. Ishman, et al. (2007). "An empirical investigation of socio-cultural factors of information sharing in China." *Information & Management* **44**(2): 165-174.
- Sia, C.-L. and C. Ou (2004). An Overview of CRM Adoption and Implementation Strategy in China. Americas Conference on Information Systems.
- Singh, N., H. Xhao, et al. (2003). "Cultural adaptation on the Web: A study of American companies' domestic and Chinese websites." *Journal of Global Information Management* **11**(3): 63.
- Steinwachs, K. (1999). "Information and culture - the impact of national culture on information processes." *Journal of Information Science* **25**(3): 193-204.
- Tan, J., K. Tyler, et al. (2007). "Business-to-business adoption of eCommerce in China." *Information & Management* **44**(3): 332-351.
- Thatcher, S. M. B., W. Foster, et al. (2006). "B2B e-commerce adoption decisions in Taiwan: The interaction of cultural and other institutional factors." *Electronic Commerce Research and Applications* **5**(2): 92-104.

- Thomas, B. S., W. K. Ralph, et al. (1998). "A comparison of attitudes toward computers among business professionals in China, Japan, and the United States." *The Journal of Computer Information Systems* **38**(3): 1.
- Triandis., H. C. (1995). *Individualism and Collectivism*, Westview Press Boulder CO.
- Wang, Y. and Y. Yuan (2006). The Role of SMS in Mobile Data Service Diffusion in China: A Longitudinal Case Study Based on Actor-Network Theory. *International Conference on Information Systems*.
- Wei, K. (2007). Sharing Knowledge in Global Virtual Teams: A How do Chinese Team Members Perceive the Impact of National Cultural Differences on Knowledge Sharing? *Americas Conference on Information Systems*.
- Weidenbaum, M. (2006). Doing Business with China. *USA Today* **135**(2738): 18-20.
- Wu, J. and Y. H. Li (2005). "Chinese firm culture and ERP implementation(in Chinese)." *Marketing Modernization* **449**(11).
- Xiao, L., H. Huang, et al. (2005). A Case Study: Information and Communication Technologies Adoption in Higher Education in China and India. *Americas Conference on Information Systems*.
- Xue, S. (2005). "Internet policy and diffusion in China, Malaysia and Singapore." *Journal of Information Science* **31**(3): 238-250.
- Xue, Y., H. Liang, et al. (2003). An Investigation of Business Planning and Information Systems Planning Integration Within Chinese Companies. *Americas Conference on Information Systems*.
- Zhang, S., L.-H. Huang, et al. (2006). "AN ANALYSIS OF INFORMATION SYSTEMS RESEARCH IN CHINESE MAINLAND." *Communications of AIS* **2006**(17): 2-27.
- Zhao, X., F. Lai, et al. (2002). "A study of Manufacturing Resources Planning (MRPII) implementation in China." *International Journal of Production Research* **40**(14): 3461-3478.
- Zucker, L. G. (1986). "Production of Trust:Institutional Source of Economic Structure 1840-1920."

Appendix A:

Cultural characteristic	Constraint on MIS use
Relationships are very personal	Preference for informal/verbal rather than formal/written communications
Decision-making is highly centralized	Limited need to exchange information between managers
Information is a major personal asset	Information is rarely broadcast or made accessible to a large audience
Decision making is based largely on intuition and experience	Limited need for the systematic collection and analysis of data
The meaning of a message depends on its context as well as its content	Data and messages will lose much of their meaning if they are encoded (in a database)
Emphasis on maintaining harmony with nature rather than controlling it	Limited role for business planning and scenario development/analysis

Source: Martinsons and Hempel