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James Teng
University of South Carolina

Kenneth Calhoun
Slippery Rock University

Myun Cheon
University of Ulsan

Scott Raeburn
Napier University

Willy Wong
Singapore Polytechnic

IS THE EAST REALLY DIFFERENT FROM THE WEST: A CROSS-CULTURAL STUDY ON INFORMATION TECHNOLOGY AND DECISION MAKING

James T. C. Teng
Darla Moore School of Business
University of South Carolina
U.S.A.

Kenneth J. Calhoun
College of Science and Business Administration
Slippery Rock University
U.S.A.

Myun Joong Cheon
College of Business Administration
University of Ulsan
Korea

Scott Raeburn
Napier University
United Kingdom

Willy Wong
Singapore Polytechnic
Singapore

1. CULTURAL DIFFERENCES: EAST VS. WEST

With the growing globalization of business in today's environment, increased multiculturalism has encouraged scholars to examine factors that enhance or inhibit the adaptation of organization and management practices across cultural boundaries (Adler 1983). Culture has been defined by Hofstede (1991) as "the collective programming of the mind that distinguishes the members of one category of people from those of another" (p. 5). Hofstede (1984) identified four constructs that have been the foundation of much cultural research: power distance, uncertainty avoidance, individualism, and masculinity. Hall (1976) identified a communications context construct and, as did Hofstede and Bond (1988), identified a time perspective construct. These cultural variables are defined as follows:

1. **Power distance:** the extent to which members of a society accept that power is unequally distributed in organizations.

2. **Uncertainty avoidance:** the degree to which members of a society feel uncomfortable with uncertainty and ambiguity, which leads them to seek conformity.

3. **Individualism:** the extent to which members of a society believe that individuals are supposed to take care of themselves and their family as compared to a collectivist society where there is unquestioning loyalty given to a larger group.

4. **Masculinity:** the extent to which a society is achievement oriented, assertive and competitive as opposed to femininity, which is the extent that a society values relationships and caring for others.

5. **Time perspective:** Hall defined this as either monochronic, which characterizes a society with a preference for sequencing tasks and working without interruption, or polychronic, which is characterized by simultaneous occurrence of many things, and involvement of many people in addressing things simultaneously. Hofstede and Bond (1988) and Hofstede (1991) refer to this construct as either short term or long term orientation.

6. **Communications context:** low context means information is stated directly and reflects a preference for hard, quantifiable detail as compared to high context, which reflects a preference to draw conclusions from implicit information via intuition.

Based on the empirical research database developed by Hofstede (1984) and results of other culture researchers (Hall 1976; Hofstede and Bond 1988; Martinsons and Westwood 1997), the cultural values of the four countries to be examined in this study, Korea and Singapore as eastern cultures and United Kingdom and the United States as Western cultures, are summarized in Table 1.

As can be seen in Table 1, the East vs. West grouping of the four countries is consistent with Hofstede's and Hall's data for all dimensions except uncertainty avoidance, which will not be used in the subsequent analysis. Throughout our analysis, it is important to realize that culture is an exceedingly complex phenomenon. Cultural contrasts between countries or regions can only be analyzed at a very high level of generalization, and extensive diversity exists within an individual culture such as the United States.

Table 1. Cultural Values of Four Countries

	United States	**United Kingdom**	**Singapore**	**Korea**
Power Distance	Small	Small	Large	Large
Individualism	Both individualist		Both collectivist	
Masculinity	Both masculine		Both feminine	
Uncertainty Avoidance	Weak	Weak	Weak	Strong
Time Perspective	Both monochronic and short term		Both polychronic and long term	
Communication Context	Both low context		Both high context	

2. STUDY OBJECTIVES AND MODEL

In recent years, access to computing and communication facilities in organizations has been increasingly dominated by user initiated and controlled activities, such as spreadsheet, e-mail, WWW and groupware use, rather than through traditional applications such as inventory and accounts payable systems. Such spontaneous computing and communication activities are

becoming a part of work itself in the organization, and this emerging new environment has been conceptualized by IS scholars as organizational computing (OC) (Applegate et al. 1991).

We intend to explore one important aspect of the OC environment, namely decision making. As indicated by Teng and Calhoun (1996), in most previous studies decision making was often treated as a singular concept and no distinction was made between more and less structured decisions (Kirs et al. 1989). Based on Teng and Calhoun's characterization of the OC environment for decision making, we identify two types of decision making—highly structured operational decisions and highly unstructured managerial decisions—and two dimensions of IT—computing and communication—giving rise to four independent variables for the study:

- computing use for operational decisions (PC-OP)
- communication use for operational decisions (CM-OP)
- computing use for managerial decisions (PC-MG)
- communication use for managerial decisions (CM-MG)

The purpose of the study is to examine how IT use for decision making may be perceived differently in different cultures. Specifically, we will study the possibility that culture may moderate the relationships between these four facets of OC and two dependent variables. The first two of the four independent variables are related to perceived effects of IT use on operational decision making, while the other two are related to perceived effects of IT use on managerial decision making.

3. RESEARCH HYPOTHESES

A set of research hypotheses are proposed to examine six aspects of perceived IT effects on decision making grouped into three categories: (1) information usage in decision making—timeliness of data and information overload; (2) decision making process —decision making speed and extent of analysis; (3) organizational impact— decision routinization and decision communication.

Eastern cultures are collectivist, long-term oriented, and strive to achieve consensus in decision making. Timely information reflecting the latest conditions are not essential to their long-term frame of mind. In contrast, Western managers, being more individualistic and masculine, tend to react more quickly to decision problems, which require timely information. Thus,

> **Hypothesis 1** **(Timeliness of data: West > East):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage increases the timeliness of data in decision making among Western managers than Eastern managers.

While low context communication cultures in the West are accustomed to the codification of data into strict meanings, Eastern managers grow up in high context communication cultures and always strive to interpret the "meaning" of data received. Eastern cultures are high power distance cultures where subordinates are dependent upon superiors and are more likely to accept an unequal status. As such, they tend to work in a more constrained atmosphere. When the amount of data to be interpreted increases dramatically as a result of IT, they are more susceptible to information overload than their Western counterparts. Thus,

> **Hypothesis 2** **(Information overload: East > West):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage increases information overload in decision making among Eastern managers than Western managers**.**

Western decision makers are individualistic and masculine, which suggests an aggressive approach to decision making. Also, they are more short-term oriented and thus predisposed to accomplishing tasks quickly, in a sequential manner. Eastern managers, being collectivist and long-term oriented, take a more consensus approach to decision making, resulting in more deliberation and a less hurried decision making process. Thus,

Hypothesis 3 **(Decision making speed: West > East):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage facilitates faster decision making among Western managers than Eastern managers.

Western cultures are short-term, masculine and individualistic cultures, all of which suggest a more structured analytical approach, while the Eastern cultures are more holistic, long-term and collectivist, which suggests a slower, deliberate and more exhaustive decision making process (Hofstede and Bond 1988; Martins0ns and Westwood 1997). Thus,

Hypothesis 4 **(Extent of analysis: East > West):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage increases the extent of analysis in decision making among Eastern managers than Western managers.

According to Hofstede (1984), large power distance cultures show a preference for centralized organization structure built on rules and procedures, where subordinates expect to be told what to do. On the other hand, people in small power distance cultures are less tolerant of rules and regulations and expect to be consulted. Therefore, if IT leads to decision routinization, the extent would be more pronounced in the East than the West:

Hypothesis 5 **(Routinization of decisions: East > West):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage leads to routinization of decision making among Eastern managers than Western managers.

Eastern cultures are collectivist, which suggests that more consensus must be reached in decision making, while the West is more individualistic. Consensus is accomplished by communications among group members and opportunities to communicate through IT would be more welcomed in the East than the West:

Hypothesis 6 **(Decision communication: East > West):** The intensity of IT usage for decision making is more positively associated with the perception that IT usage improves decision communication among Eastern managers than Western managers

4. METHODOLOGY

The field survey methodology was used in this study. The work of Teng and Calhoun (1996) was modified and replicated in several national cultures. The survey instrument was thoroughly pre-tested and then distributed to a total of 207 managers in four countries: 102 in the East (Korea and Singapore) and 105 in the West (United States and United Kingdom). The West samples are students enrolled in two part-time professional MBA programs—from one state university in the United States and two public universities in the United Kingdom—and from members of a professional management organization in a mid-size U.S. city. All respondents held full-time positions in business firms or other organizations. The East sample consists of managers attending a training seminar offered by one university in Korea and another in Singapore

The instrument used by Teng and Calhoun was modified and expanded to measure the research variables. Independent variables are based on perceived intensity of IT usage. Highly structured operational and highly unstructured managerial decisions are carefully defined along with illustrative examples. Multiple five-point scaled items are used for each of the 12 dependent measures (two for each of the six variables). Cronbach alphas are all greater than .7 or .8 except the two for information overload, which are greater than .67, indicating sufficient levels of internal consistency of the various constructs.

An examination of the profile of respondents indicates that the two samples of managers from the East and the West are generally comparable in terms of their levels in management, a somewhat similar distribution of industries, functional areas, age and education.

5. RESEARCH RESULTS

Correlation analyses were conducted for the six decision factors, for both dimensions of IT and for both operational and managerial decisions. The differences between the correlation coefficients between the East and the West was tested using the Z statistics described by Arnold (1982) and the results are summarized in Table 2.

Hypothesis 1 (timeliness of data) is not supported. In fact, the result pertaining to CM-OP is opposite to the predicted direction. It appears that Eastern managers, with their high communication context, take greater advantage of the communication technology to obtain more timely information in consensus building. Hypothesis 2 (information overload) was supported for two of the comparisons. Thus, our evidence suggests that the low context West is more easily able to deal with hard, quantified data while the high context East is more concerned with clues to meaning and thus is more likely to be overwhelmed by the amount of data available.

Hypothesis 3 (decision speed) is not supported. It would appear that time perspectives and masculinity may not be involved in decision speed. Also, no support is found for Hypothesis 4 (extent of analysis), suggesting that IT is employed in both analytic and synthetic decision making approaches, and IT is neutral in this regard.

Hypothesis 5 (routinization of decisions) was supported, lending credence to the contention that Eastern cultures, being high in power distance, are more receptive to rules and regulations and conformity than is the West. Hypothesis 6 (decision communications) was supported for one of the comparisons. The collectivist nature of Eastern cultures prefers consensus, which would encourage communications under certain conditions.

6. DISCUSSION AND CONCLUSION

Our study indicates that culture has limited impact on some specific aspects of IT's use in decision making. An examination of the rows in Table 2 reveals that information overload and routinization are constructs where two of the four comparisons were

Table 2. Differences between Correlation Coefficients

Perceived Effects on Decision Making	**IT Usage in Operational Decisions** (related to operational decisions)		**IT Usage in Managerial Decisions** (related to managerial decisions	
	Computing (PC-OP)	**Communication (CM-OP)**	**Computing (PC-MG)**	**Communication (CM-MG)**
Information Usage in Decision Making				
H1—Timeliness of data	n.s.	$p < .05$ (opposite)	n.s.	n.s.
H2—Information overload	$p < .05$	n.s.	$p < .01$	n.s.
Decision Making Process				
H3—Decision making speed	n.s.	n.s.	n.s.	n.s.
H4—Extent of analysis	n.s.	n.s.	n.s.	n.s.
Organizational Impact				
H5—Decision routinization	n.s.	$p < .05$	n.s.	$p < .05$
H6—Decision communication	n.s.	n.s.	$p < .05$	n.s.

significant. In both cases, we see East showing greater relationships than the West. These can be attributed to the higher communication context and power distance among Eastern managers. It should be noted that, while routinization comes through communication, overload occurs with computing. This is an extremely interesting pattern. Eastern managers do not experience higher overload with communication technology, since their high communication context culture finds a natural "home" in the technology which has a higher "band width" than computing and provides more context in decision discussion. On the other hand, power distance is typically manifested in the process of communicating with superiors, subordinates and other co-workers, and this explains why the routinization effect shows through communication rather than computing. Similar interpretation can be made for the results pertaining to timeliness of data and decision communication.

It appears that cultural values that exert significant influence on IT's use in decision making are those that are directly involved in information processing in organizations (Galbraith 1973), namely power distance and communication context. Different levels of power distance would determine the amount of vertical information flow in a hierarchy (Galbraith 1973). For communication context, its immediate consequence is also in information processing by members of an organization. Eastern managers would tend to look for multiple cues and implicit meaning, while their western counterparts focus on established sources and explicit meaning. Other cultural values, such as individualism and masculinity, are more multi-faceted and do not relate primarily to information processing. These variables can be expected to influence complex management practices such as reward systems (Kim, Park and Suzuki 1990) rather than the use of IT.

The study results as summarized in Table 2 indicate that the managers from both the East and West have similar perceptions of IT's impact on decision making, suggesting that the effects of culture on IT's role in organizations appears to be less dramatic than the literature would suggest. It seems that IT use in decision making has a great equalizing effect on people of different cultures. Most previous studies that have demonstrated the impacts of cultural differences on IT use were conducted in laboratory settings, mainly involving group support systems (GSS), which enable more equity in participation by group members. For example, Tan et al. (1998) showed that the collectivist eastern culture, as reflected by the majority influence, persisted even with the use of GSS, while the more individualistic Western managers were able to take advantage of the technology to reduce majority influence. It is important to stress that, instead of using a specific system such as GSS, respondents to our study reported their perceptions of IT in the omnipresent organizational computing environment that blends into the daily work life. While a specific system like GSS may have some features that directly promote or restrict certain cultural traits of its users in a lab-like condition, the OC environment is a natural setting for the work place where no single feature of the technology can be expected to elicit culturally differentiated reactions over a long period of time. "Policy conflicts are less likely to occur in technology and finance, which are relatively culture-independent, and more likely in marketing and personnel where cultural diversity is the largest" (Hofstede and Bond 1988, pp. 20-21). "Yet even as the culture-laden nature of our theories becomes apparent, some scholars argue that international market competition and the pervasive use of information technology will rapidly erode the differences between cultures and lead us to a converging set of business strategies, organization structures and management practices." (Martinsons and Hempel 1995, p. 2). Perhaps IT is becoming a universal tool, transcending cultural differences.
Based on our preliminary evidence, we have tentatively identified certain limited roles of culture in the use of IT for decision making and concluded that such use of IT in the OC environment is perceived similarly in different cultures. The implications of such knowledge do not just benefit researchers. Practitioners in multinational corporations may strategically focus on a few critical cultural variables instead of directing their precious resources on factors that are inconsequential. As our results are based on perceptual response from a limited number of subjects in four countries, future researchers may wish to collect objective measures from larger samples in more countries to further affirm the patterns of findings reported here.

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