

Strategic decision making and support systems: Comparing American, Japanese and Chinese management

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Received 13 May 2005; received in revised form 4 October 2006; accepted 12 October 2006

Available online 22 November 2006

Abstract

Internationalization creates a need to know how managers in different parts of the world make decisions, and how computer-based information systems (IS) can support decision making. Business leaders from the United States, Japan and China were each found to have a distinctive prevailing decision style that reflects differences in cultural values and the relative needs for achievement, affiliation, power and information. This paper examines the IS issues that arise from the discovery of the distinctively American, Japanese and Chinese styles of strategic decision making. The existence of international differences in analyzing and conceptualizing strategic decisions raises doubts about the global applicability of IS such as decision support systems and executive information systems. The success of knowledge management and information systems in different countries and cultures will depend critically on how well IT applications are adapted to the decision styles of their users.

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Keywords: Strategic decision making; International differences; Culture; American management; Chinese management; Japanese management; Decision styles; Critical success factors; Decision support systems; Executive information systems

1. Introduction

Decision making is a fundamental activity for managers. A leading textbook author has described it as “the essence of the manager’s job” [68] and “a critical element of organizational life” [69]. Meanwhile, a Nobel laureate suggests that decision making is synonymous with managing [74]. Many types of computer-based information systems (IS) have been developed to support decision making, including decision support systems

(DSS), group support systems (GSS) and executive information systems (EIS).

Managers all over the world must make decisions that significantly affect their organizations. However, differences in the socialization of managers and the business environments that they face may affect both their decision-making *processes* and the *choices* that they make. The existence of different decision-making approaches has been recognized for decades [41,74]. More recently, Rowe and Boulgarides ([72], p. 28) assert that: “Knowing an individual’s decision style pattern, we can predict how he or she will react to various situations”. This knowledge is also critical to an understanding of the extent to which, and how, a manager may use an IS such as DSS, GSS or EIS.

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As international interactions increase in frequency and importance, there is a growing need to know how managers make decisions in different parts of the world, and how IT applications may support their decision-making activities. This paper focuses on the *process* of decision making rather than the preferred/chosen alternative(s) or the subsequent consequences (outcomes). It first compares and contrasts the decision styles of top managers in three of the world's largest national economies – the United States, Japan and (the People's Republic of) China – and then considers how IT applications can support each decision style. We thus build upon the discovery of national differences in decision making to provide specific guidance for adopting and adapting various decision-supporting IS. Although our study does *not* evaluate or compare the effectiveness of different decision styles, we do consider the relative usefulness of IS such as DSS and EIS to support the styles of strategic decision making that prevail in American, Chinese and Japanese businesses. We expect to contribute to the literatures on international business, information systems, and strategic management while also serving the needs of IS professionals and international business managers.

We first review relevant subsets of the literatures on both human decision-making and decision-supporting information systems. Second, we present our research design and method. Third, we distinguish the three national groups in terms of their decision styles. Fourth, we discuss the implications of these differences for IT applications such as DSS, GSS and EIS. We then note the limitations of our study, identify opportunities for further research, and finally present a conclusion.

2. Literature review

2.1. Influences on decision making

The *process* of decision making depends on many factors, including “the context in which a decision is made, the decision maker's way of perceiving and understanding cues, and what the decision maker values or judges as important” [71]. Two of the most significant influences on decision making are values and cognitive perception. Both affect how a decision maker will interpret and respond to particular stimuli and sets of conditions [2,57]. For example, urgent and comprehensive responses are more likely when situations are perceived as threats rather than opportunities [17,22].

Values are integral to thoughts and actions. They are typically ingrained during childhood and then reinforced or refined by experiences during adolescence and

adulthood [43]. Values influence the evaluation of both problems (e.g., is it serious? is it solvable?) and potential solutions (e.g., is it worth trying? was it successful?); the processes used to make choices; the development of interpersonal relationships; the boundaries of and limits for ethical behavior; and the response to external pressures and extrinsic motivational forces (cf. [20]).

Different people have different values. Hofstede [30] studied the work-related values of IBM employees in over 60 countries and found huge variations. National background (or societal culture) explained about half of the overall difference in these values. This was far more than the proportions explained by professional role, age, or gender. Given the influence of societal (or national) values on how decisions are made, international differences in work-related decision making are expected.

Cognitive perception is another major influence on decision making. The management of information inevitably involves judgment biases. These biases lead to varying frames of reference and subjective interpretations of situations which in turn determine our responses to specific stimuli [5].

Cognitive perceptions have also been found to differ greatly across countries and continents. Given the geographic scope of our study, it is essential to recognize the key difference observed in trans-Pacific experimental studies: East Asians typically think more holistically and contextually whereas North Americans concentrate on foreground items and specific details [60]. For example, when shown an image of a tiger in a jungle, Americans tend to focus on the tiger (foreground item) while their Japanese and Chinese counterparts tend to observe the jungle as a whole (general context).

Meanwhile, a survey of Japanese found that they perceived Western (and particularly American) thinking to differ vastly from their own way of thinking [59]. They characterized Western thinking as objective, analytic, cerebral, and impersonal as opposed to a self-perception of subjective, synthetic, emotional, and personal thinking. The rigid Western distinction between the rational and the irrational has also been contrasted with the Japanese concept of *omoi*, which bridges the two [48].

The differences in values and perceptions can be explained by cultural factors. Concepts such as hierarchy, collectivism, and attention to context are more important for East Asians, because they have prescribed roles and relationships within relatively complex and stable social networks [32]. In contrast, North Americans live in a simpler and less constraining social environment, enabling them to be more egalitarian, individualistic, and less attentive to context. Since decision makers will perceive and process new information based on their

existing values and perceptions, significant differences in work-related decision making are likely between Americans and Asians.

2.2. Decision-making styles

The psychology literature includes several proposals to classify different *types* of decision makers. For example, Jung’s [41] personality types spawned the Myers-Briggs Type Indicator test while another classification scheme dichotomizes introverts and extroverts [58]. More recently, Rowe and Boulgarides [71] proposed a model of decision *styles* that recognizes the influence of values and perceptions. The model, shown in Fig. 1, suggests that decision makers are driven by four forces.

The four forces – directive, analytic, conceptual, and behavioral – can be related to the typology of needs developed by McClelland [53]. McClelland initially proposed that behavior is motivated by the needs for achievement, power and affiliation. Subsequently, he recognized that the need for achievement may be satisfied in two different ways, either intrinsically by taking on new challenges or extrinsically by receiving praise and recognition.

In the Rowe and Boulgarides typology [71], the primary need of directive decision makers is power. They are results oriented, but also want to dominate others. They have a low tolerance for ambiguity and prefer low levels of cognitive complexity. This preference limits the amount of information that they gather and the number of alternatives that they consider.

Analytic decision makers have a strong need for achievement in the form of new challenges. They have greater tolerance for ambiguity than their directive counterparts. Their comfort with cognitive complexity strongly encourages data collection and processing. They make decisions slowly because they want to examine the situation thoroughly and consider many alternatives systematically.

Conceptual decision makers are achievement oriented like their analytic counterparts, but crave extrinsic rewards, such as praise, recognition, and independence. They are comfortable with a high degree of cognitive complexity and also have a strong people orientation. Conceptual decision makers typically gather information from multiple sources and consider many alternatives. They tend to take a long-term perspective, exhibiting considerable creativity and idealism.

Behavioral decision makers are driven primarily by a need for affiliation. This type has a low cognitive complexity, but a strong people orientation. Behavioral style managers tend to communicate easily and be very concerned with the well-being of their peers and subordinates. They are typically receptive to suggestions, willing to compromise, and prefer loose controls.

A Decision Style Inventory (DSI) was developed to measure the relative propensity to make use of the four decision styles [72]. This instrument does *not* measure absolute values on each style. Instead, scenario-based items are used to determine the relative scores of either an individual or a sample drawn from one population compared to samples drawn from other populations or the population as a whole. Consequently, this instrument

		Left brain hemisphere	Right brain hemisphere
Cognitive Complexity	High	<p>Analytic</p> <p>Enjoys solving problems/puzzles Uses considerable data Undertakes careful analysis</p> <p>Strong need for achievement (in the form of challenges)</p>	<p>Conceptual</p> <p>Creative and humanistic Broad and long-term focus Seeks independence</p> <p>Strong need for achievement (in the form of recognition)</p>
	Low	<p>Directive</p> <p>Aggressive and autocratic Acts rapidly Uses rules and intuition</p> <p>Strong need for power</p>	<p>Behavioral</p> <p>Supportive and empathetic Prefers communication/discussion Uses intuition rather than data</p> <p>Strong need for affiliation</p>
		Task Oriented	People Oriented
		Values	

Fig. 1. Decision style model (adapted from [72]).

(which is presented in full and discussed further in [72]) is useful to compare the decision-making styles of specific individuals or groups [6].

The DSI has been tested extensively for validity, including split-half and test–retest reliability studies, item analysis, and correlation with other test instruments (see [46] for a summary). Item–factor correlations and other indices of model adequacy have been examined using samples from both Western and Asian populations. The DSI’s reliability and validity have been confirmed based upon the criteria of Robey and Taggart [70]. It has “a very high face validity and reliability. Respondents have almost invariably agreed with their decision styles as shown on the test instrument” ([72], p. 28).

2.3. Information systems to support decision making

In addition to knowing how people make decisions, it is also important to understand how various types of IS can support human decision making.

Decision Support Systems (DSS) were first developed in the 1970s, and have been used widely since the PC revolution in the 1980s. DSS can be described as “computer-based systems that help decision makers confront ill-structured problems through direct interaction with data and analysis models” ([54], p. 428). DSS are designed to increase the speed and accuracy of data analysis, while reducing costs, enabling the effective and efficient analysis of large volumes of quantitative data. DSS were originally developed as tools for managers, but they are now also used by many non-management employees such as salespeople and purchasing officers. DSS are particularly valuable tools in complex situations, where decision makers need to analyze multiple sources of data.

Group Support Systems (GSS), formerly known as Group DSS, trace their origins to the 1970s, but have been researched and developed extensively since the mid-1980s. GSS are networked systems that facilitate discussion by groups of proximate or distributed individuals synchronously or asynchronously. A GSS includes software tools designed to focus and structure group deliberation, reducing the cognitive costs of communication as group members work collectively towards a goal. The tools typically facilitate brainstorming, idea organization and evaluation, and consensus formation. Participation can be identified or anonymous, the latter often used when controversial topics are discussed, or when there is a need to protect the identity of members [12]. While GSS are designed for group use, managers can also use them to identify new ideas from their employees.

Executive Information Systems (EIS) are intended specifically for executives. They have been used to monitor and communicate company performance data and to scan the business environment [3,19,54]. An EIS can be described as a DSS that “(1) provides access to (mostly) summary performance data, (2) uses graphics to display and visualize the data in an easy-to-use fashion, and (3) has a minimum of analysis or modeling beyond the capability to ‘drill down’ in summary data to examine components” ([54], p. 434). EIS enable managers to extract data on key performance indicators quickly and cleanly, and thus support the information gathering phase of the decision-making process. EIS are valuable tools for decision makers who want to simplify their decision space without having to lose their independence by communicating with peers or colleagues.

DSS, GSS and EIS are each more compatible with some decision styles than others. We suggest that an analytic decision maker will benefit from both the detailed analysis enabled by a DSS and the big picture perspective provided by an EIS. Meanwhile, the aggregated profile that an EIS provides will help the directive decision maker to make decisions quickly without encountering too much cognitive complexity. In contrast, the conceptual decision maker’s interest in exploring a wide assortment of what-if scenarios can be supported by a DSS and a GSS. Finally, behavioral decision makers may appreciate the facility of the GSS to capture the ideas of many stakeholder groups. Fig. 2 (see below) captures this compatibility and illustrates how a DSS, GSS and/or an EIS may lend itself more readily to different decision makers.

There have been many studies on the application and use of DSS, GSS and EIS in the United States. Numerous textbooks, journals and websites are dedicated to this topic area. In contrast, research on IS to support decision making is much more limited in both Japan and China. Several reports focus on DSS development issues in both China [9,11,75,77,85], and Japan [61,88]. Specific DSS applications have also been considered, particularly in China [21,24,76,90]. However, almost all of these papers focus on the application of DSS for operational control rather than to support the strategic decision making by top management.

The GSS literature on China and Japan is similarly limited. Reports on GSS in Japan tend to be based on anecdotal evidence or weak research designs. Some studies have been undertaken in Hong Kong [12,13,14,16,44] and China [66,86], but they involved either students in experiments or operational-level issues in organizations: usage by senior executives has not been documented.

		Propensity to Adopt GSS	
		Low	High
Propensity to Adopt DSS	High	<p>Analytic</p> <p>Reliance on careful analysis of large volumes of codified data</p> <p>Interest in both the details of situation and the larger, aggregated profile.</p>	<p>Conceptual</p> <p>Data processing is useful to consider long-term what-if scenarios.</p> <p>Some IT applications may be useful for interpersonal relationships.</p>
	Low	<p>Directive</p> <p>Limited interest in large-scale data analysis or human relationships.</p> <p>Interest in the aggregated profile of the situation to support a rapid decision making process</p>	<p>Behavioral</p> <p>Limited interest in data processing since information and rules are less important than intuition and relationships.</p> <p>Tools that facilitate communication and consensus-building will be used.</p>
		High	Low
		Propensity to Adopt EIS	

Fig. 2. Information technology applications and decision styles.

EIS development issues in East Asia have also been investigated [55], but we found only three published studies that examined the actual use of EIS by managers in East Asia. One considers the effect of computer self-efficacy on the use of executive support systems in Taiwan [38], a second reports on the critical success factors for EIS in Hong Kong [65] while a third focuses on EIS in Japan [45]. However, none of them considers how EIS support strategic decision-making processes.

3. Research context

A large body of literature has considered general aspects of American values, attitudes and behaviors, and highlighted differences with both the Japanese and the Chinese (e.g., [1,26,37]). Other streams of literature have looked specifically at Japanese management and Chinese management, in isolation (e.g., [10,83]), in comparison to each other [8,23], or compared to an American/Western baseline (e.g., [51,52,62,64]). The comparative literature has advanced our knowledge in many facets of management, but strategic decision making is not one of them. Schwenk ([73], p. 484) acknowledged this neglect and went on to suggest “that many of the conclusions about strategic decision making developed in the U.S. context will have to be modified in order to be applicable across cultures.”

In order to better understand the decision styles of business leaders in different contexts, it is appropriate to look beyond the management (systems) that character-

ize a specific country [8,51] to the prevailing values that shape decision making [63,67]. A review of the literature on societal culture, and particularly the subset examining cross-cultural differences, was helpful to theorize how business leaders from the U.S., Japan and China may differ in their decision making.

As “a collective programming of the mind which distinguishes one category or people from another” ([31], p. 9), cultural values at the national or societal level are likely to exert a significant influence on decision making. In a groundbreaking study of about 116,000 IBM employees from over 60 countries, Hofstede [30] identified four dimensions of work-related values: power distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance. The power distance (PD) dimension reflects the extent to which the members in a society accept the unequal distribution of power. The individualism–collectivism (IND) dimension reflects the degree to which people are able and prefer to achieve an identity and status on their own rather than through group memberships [31]. The masculinity–femininity (MAS) dimension reflects the degree to which assertiveness and achievement are valued over nurturing and affiliation. The uncertainty avoidance (UA) dimension measures discomfort with ambiguity and incomplete information.

Despite selective criticism of both his research method (see [36] for an incisive review) and a Western bias (cf. [87]), the dimensions identified by Hofstede [30] have become a popular framework in cross-cultural research. His

Table 1
National scores on five cultural dimensions [30,31]

Dimension	U.S.	Japan	China	Hong Kong	Singapore	Taiwan	Mean country score	Range of country scores
Power distance	40	54	80	68	74	58	57	11–104
Uncertainty avoidance	46	92	45	29	8	69	64	8–112
Individualism (opposite of collectivism)	91	46	20	25	20	17	38	6–91
Masculinity (opposite of femininity)	62	95	60	57	48	45	49	5–95
Long-term orientation	29	80	118	96	48	87	46	0–118

results, summarized in Table 1, provide a solid foundation for theorizing about national differences in decision styles.

Many studies undertaken since Hofstede [30] have found similarly significant national differences in cultural values. These include Triandis [78,79], Trompenaars [80], and the GLOBE study [34,35]. The GLOBE study measured practices (the way that things are done, *as-is*) and values (the way that things should be done, *should-be*) of three industries (financial services, food processing and telecommunications) in 62 societies. It identified eight dimensions on which societal cultures vary. The GLOBE scores of the U.S., Japan, China (mainland), and Hong Kong are shown in Table 2.

4. Theory and hypothesis development

In order to theorize and develop specific hypotheses, it was helpful to draw upon the findings and conclusions of not only Hofstede [30], but also several of the other aforementioned cross-cultural studies. As described below, hypotheses were developed based upon national differences in power distance and individualism–collectivism as well as uncertainty avoidance and performance orientation.

4.1. Power distance and individualism–collectivism

The Chinese-dominated societies (including Hong Kong and Taiwan) in Hofstede's original study, and mainland China in subsequent replications, all scored

much higher on power distance (with PD scores >65) than either Japan (PD score=54) and especially the United States (PD score=40). The PD score is inversely correlated with the degree to which subordinates participate in the decision-making process. Low PD scores for the U.S. should produce comparatively more democratic and participatory decision making in American workplaces. In contrast, Chinese managers will tend to be more hierarchical, shunning employee participation in the decision-making process.

Hofstede [30] also found that the U.S. scored higher on individualism (IND score=91) than any other country. The U.S. score greatly exceeded that of Japan (IND=46) and the Chinese-dominated societies in Hofstede's initial study, and an estimated score of 20 for China itself in subsequent research [31]. The very high level of individualism in America should encourage decision-making processes that both focus on self-interest and rely on objective analysis (rather than subjective factors). It should also favor the expression of viewpoints that may compromise harmony.

Subsequent studies replicating Hofstede's approach in Chinese societies (cf. [39,47]) tend to confirm that, despite some sub-cultural differences attributable to variations in political and economic systems, the work value scores of mainland China broadly resemble those found in Hong Kong and Taiwan. Recent research (cf. [35,67]) also confirms the persistence of significant international differences in values resembling Hofstede's PD and IND dimensions.

Table 2
National scores on the GLOBE study of 62 societies [34]

Dimension	U.S.	Japan	China (mainland)	Hong Kong, China	Mean country score	Range of country scores
Power distance	4.88	5.11	5.04	4.96	5.17	3.89–5.80
Uncertainty avoidance	4.15	4.07	4.94	4.32	4.16	2.88–5.37
Collectivism institutional	4.20	5.19	4.77	4.13	4.25	3.25–5.22
Collectivism — in-group	4.25	4.63	5.80	5.32	5.13	3.53–6.36
Future orientation	4.15	4.29	3.75	4.03	3.85	2.88–5.07
Assertiveness	4.55	3.59	3.76	4.67	4.14	3.38–4.89
Performance orientation	4.49	4.22	4.45	4.80	4.10	3.20–4.94
Humane orientation	4.17	4.30	4.36	3.90	4.09	3.18–5.23
Gender egalitarianism	3.34	3.19	3.05	3.47	3.37	2.50–4.08

Although the PD concept has remained broadly unchanged since Hofstede [30], the same cannot be said for the IND dimension. Harry Triandis and his colleagues have provided further evidence for the existence of individualistic–collectivistic differences between societies and also elaborated this construct. Triandis [78] found that this construct consisted of four factors — two reflecting individualism (self-reliance with hedonism, separation from in-groups) and another two reflecting collectivism (family integrity, interdependence with sociability).

Subsequently, Triandis [79] proposed that the key attributes distinguishing different kinds of individualism and collectivism are the relative emphases on horizontal and vertical social relationships. Horizontal patterns of relationships assume that one person has more or less the same status as another person. On the other hand, vertical patterns of relationships consist of hierarchies, with one person being at a substantially different status level than the other(s). Triandis [79] went on to suggest four types of societies. In horizontally individualistic societies, people are very self-reliant and want to be seen as unique or distinct, but they are not especially interested in becoming distinguished or attaining a high status. In vertically individualistic societies, people do want to attain a distinguished status, and thus they participate in individual competitions with others.

In horizontal collectivist cultures, people see themselves as similar to others, emphasize shared goals with others, and are highly interdependent. In a vertical collectivist culture, people emphasize the integrity of the group, are willing to sacrifice their personal goals for the sake of in-group goals, and support competitions between their in-group and outsiders. They will follow directions given by authorities without objecting (even if they personally disagree with those directions) so long as their in-group will benefit as a result.

The GLOBE study [34] built upon the ideas of Triandis [79] to distinguish between institutional and in-group collectivism. Institutional collectivism reflects the degree to which institutional practices encourage collective action. The GLOBE study assessed “whether group loyalty is emphasized at the expense of individual goals, whether the economic system emphasizes individual or group interests, whether being accepted by other group members is important, and whether individualism or group cohesion is valued more in the society” ([34], p. 463). In contrast, in-group collectivism was “operationalized by a set of four questions that assessed the degree to which individuals express pride, loyalty, and interdependence in their families” ([34], p. 463).

Japan scored higher than both the U.S. and China on institutional collectivism. This suggests that Japanese would place a greater emphasis on group interests and have a higher need for affiliation. This encourages consensus-based decision making and, applying the Rowe and Boulgarides typology, a behavioral decision style. Meanwhile, China scored higher on in-group collectivism than the other two countries. This need to maintain a hierarchical structure is thus more likely to be evident in Chinese businesses than those found in Japan or the United States. This suggests a more autocratic and directional decision style.

Given that Japan scores higher on institutional collectivism than either than the U.S. or China, China scores higher on in-group collectivism than either the U.S. or Japan, and China scores higher on power distance than either Japan or the U.S., it was hypothesized that:

H1a. The decision styles of Japanese business leaders are comparatively more behavioral than those of Chinese business leaders.

H1b. The decision styles of Japanese business leaders are comparatively more behavioral than those of American business leaders.

H2a. The decision styles of Chinese business leaders are comparatively more directive than those of Japanese business leaders.

H2b. The decision styles of Chinese business leaders are comparatively more directive than those of American business leaders.

4.2. *Uncertainty avoidance and performance orientation*

The U.S. score on uncertainty avoidance (UA score=46) was significantly lower than that of Japan (UA score=92) in both the original Hofstede [30] study and several more recent replications. Meanwhile, the GLOBE study [34] scored China significantly higher on uncertainty avoidance (4.94) than either the U.S. (4.15) or Japan (4.07).

Uncertainty can be avoided using two different decision styles: gathering more information and thus adopting an “analytic” style or gathering the support of other people, with the aim of achieving a consensus, and thus adopting a “behavioral” style. In the West it is widely assumed that uncertainty can be reduced by gathering and processing more information [52]. However, Japanese business leaders are more collectivistic and consensual decision makers than their U.S. counterparts [42]. This national-level difference provides additional theoretical support for H1a and H1b above.

Hofstede [31] related his own findings to the needs typology developed by McClelland [53]. Based on data from 22 societies, Hofstede found a strong negative correlation between uncertainty avoidance and the need for achievement, suggesting that societies low in tolerance for uncertainty would tend to be less achievement oriented. The results from Hofstede [30] and the GLOBE study together with the explanatory theory developed by Martinsons and Westwood [52] suggest that East Asians are significantly more comfortable with uncertainty, including the lack of precise quantitative data, than Americans. The correlation reported by Hofstede [31] implies that U.S. business leaders will have a much higher need for achievement than both their Japanese and Chinese counterparts.

The GLOBE study also found leaders in American society to be more “performance oriented” than those in Japan or China. Performance Orientation directly relates to the notions of ambition and challenge. As a result, business leaders in the United States would be expected to set more ambitious goals, communicate higher expectations to their subordinates, and intellectually challenge those subordinates more when compared to their counterparts in Japan or China [4,33]. Given the Americans’ comparatively high need for achievement, it was hypothesized that:

H3a. The decision styles of American business leaders are comparatively more analytic than those of Japanese business leaders.

H3b. The decision styles of American business leaders are comparatively more analytic than those of Chinese business leaders.

5. Method and sample

Business newsmagazines such as *Fortune*, *Forbes* and *BusinessWeek* have sponsored periodic meetings of business leaders since the 1980s. These meetings, also known as forums or summits, have been held recently in places such as Hong Kong, Shanghai, Singapore, and Tokyo. The invitees to these meetings include the leaders of the largest and most influential firms in their respective countries. These firms tend to be heavily engaged in international business activities and together they represent a cross-section of industry and commerce from the world’s major economies.

The lead author accepted an invitation to speak at one of these meetings, held in Hong Kong during 1997, in exchange for the opportunity to study some of the world’s most influential decision makers [49]. First, quantitative data were collected to address the questions:

How do you make decisions? and What decision style do you prefer to use? More than 70% of the attendees from the U.S., Japan and China, a total of 219 business leaders, completed the Decision Style Inventory.

In order to increase the sample size and raise the reliability of the findings, an additional 90 business leaders were surveyed at a subsequent meeting held in Shanghai during 1999. Care was taken to ensure that: (1) only those with general management responsibilities, with job titles such as Chief Executive Officer, Managing Director, and President were studied; and (2) individuals attending both meetings only completed the instrument once.

Following Boulgarides and Oh [6], the decision style instrument included 19 scenario-based items. Each item featured four statements corresponding to the four driving forces — directive, analytic, conceptual, and behavioral. The instruments for the Japanese and Chinese business leaders were translated into Japanese and Chinese and then back-translated into English following the procedure recommended by Earley [18].

Respondents were instructed to assign one of the following mutually exclusive numbers to each of the four statements: 8 — if this statement is your most preferred response; 4 — if this statement is your second most preferred response; 2 — if this statement is your third most preferred response; and 1 — if the statement is your least preferred response. Since 15 points (1+2+4+8) had to be distributed across the four statements for each question, a total of 285 points (15 points × 19 items) were available for allocation. Thus, the score for each decision style may range from a minimum of 19 (1 point × 19 items) to a maximum of 152 (8 points × 19 items).

Interviews were also conducted at these meetings in order to get a deeper understanding of the quantitative findings obtained from administering the DSI, and to discuss the implications of the results, including the factors that support and/or inhibit the use of different decision styles. The current and/or potential use of various IT applications, including DSS and EIS, to support strategic decision making was also discussed. Between five and eight randomly selected leaders from each of the three countries were interviewed. The interviews, which lasted between 10 and 45 min, were either tape-recorded or accompanied by pen-and-paper note taking.

The participants in this study were American, Japanese and Chinese business leaders [49]. As the top managers of FORTUNE 500 U.S. and International companies, they included many of the most influential business people in their respective countries. The American sample included the leaders of 11 corporations that were at the time among the 30 components of the

Dow Jones Industrial Average (DJIA) on the New York Stock Exchange, such as Boeing, General Electric, Hewlett Packard, Johnson & Johnson, and Procter & Gamble. The leaders of more than 90 other large U.S. multinational enterprises that were part of Standard & Poor's 500, such as Applied Materials, Compaq Computer, Eastman Kodak, Kellogg, and Union Carbide, were also sampled.

The Japanese sample included leaders from 67 companies that were at the time part of the Nikkei 225 Index on the Tokyo Stock Exchange. These enterprises included Canon Inc., Japan Airlines Corporation, KAO Corporation, three companies within the Mitsubishi group, Nippon Steel Corporation, and two companies in the Sumitomo group.

The Chinese sample included the leaders of more than 20 private-owned or family-controlled ventures. However, it was dominated by the top managers from well-established state-controlled enterprises, many of which had listings on major stock exchanges in New York and/or Hong Kong. These state enterprises included Brilliance China, China Everbright, China Overseas Shipping Company (COSCO), China Unicom, CITIC Pacific, and Shanghai Industrial.

The three national samples were well matched demographically, as shown in Table 3. The most significant discrepancies involved education levels and years of experience with the organization. The Chinese had less formal education than their American or Japanese counterparts. This can be attributed to the

Table 3
Demographic characteristics of the respondents

	Americans <i>n</i> =139	Japanese <i>n</i> =82	Chinese <i>n</i> =88
Age (Years)			
Mean	44.7	46.3	43.3
Range	35–59	39–58	36–57
Education			
Secondary school or less	11%	9.8%	27%
Post-secondary study	61%	72%	52%
Graduate-level study	28%	18%	20%
Experience (Years)			
Overall work			
Mean	23.8	25.5	24.2
Range	13–40	17–41	11–37
With organization			
Mean	9.7	14.8	11.5
Range	1–33	7–36	2–22
As a top manager			
Mean	3.5	5.1	6.2
Range	1–14	1–13	1–15

Table 4
Scores on the decision style inventory

	Americans	Japanese	Chinese	One-way ANOVA <i>F</i> -scores and significance
Directive mean	64.8	69.4	84.3	38.731
S.D.	(8.3)	(6.4)	(6.7)	<i>p</i> =0.001
Analytic mean	82.2	71.8	73.0	18.854
S.D.	(7.7)	(6.3)	(7.8)	<i>p</i> =0.002
Conceptual mean	79.1	72.7	67.5	23.652
S.D.	(8.8)	(6.5)	(7.4)	<i>p</i> =0.001
Behavioral mean	58.8	71.1	60.2	21.206
S.D.	(6.8)	(5.9)	(6.6)	<i>p</i> =0.001
Total	285	285	285	

Means (and standard deviations) of national samples.

suspension of schooling in mainland China during its Cultural Revolution (c. 1966–1976), “which affected the formal education of a whole generation of young people” ([56], p. 935). Meanwhile, the Japanese had spent more time (mean=14.8 years) with their current organization than either the Chinese (mean=11.5 years) or the Americans (mean=9.7 years). This reflects the traditional policy of life-long employment in Japan.

6. National differences in decision styles

Business leaders from the U.S. had *either* the highest or lowest average score among the three national samples on every one of the four decision styles. The American sample had the highest score among the three national samples on both the conceptual decision style (mean=79.1) and the analytic decision style (mean=82.2), but the lowest on both the directive style (mean=64.8) and behavioral style (mean=58.8). The Chinese business leaders scored highest on the directive style (mean=84.3) and lowest on the conceptual style (mean=67.5). Meanwhile, the Japanese scored lowest among the national samples on the analytic style (mean=71.8) and highest on the behavioral style (mean=71.1). The mean scores and standard deviations for the three national samples on each of the four decision styles, along with the one-way ANOVA *F*-scores and their significance, are shown in Table 4.

Pairwise *t*-tests were used to identify significant differences between the scores of the national samples on the four decision styles. Consistent with the hypotheses, the international comparisons revealed that Chinese business leaders scored significantly higher (at a 99% confidence level) on the directive decision style

Table 5
Pairwise *t*-test comparisons on directive decision style

	Americans	Japanese	Chinese
Americans	NA		
Japanese	64.8 vs. 69.4 <i>t</i> =2.01, <i>p</i> =0.03, <i>df</i> =219	NA	
Chinese	64.8 vs. 84.3 <i>t</i> =3.35, <i>p</i> <0.01, <i>df</i> =225	69.4 vs. 84.3 <i>t</i> =3.02, <i>p</i> <0.01, <i>df</i> =168	NA

than those from both the United States and Japan, as shown in Table 5. The Japanese business leaders also scored higher on the directive style than their American counterparts.

American business leaders scored significantly higher (at a 99% confidence level) on the analytic decision style than their counterparts from both China and Japan on both the analytic decision style (see Table 6) and the conceptual decision style (Table 7). The Japanese business leaders scored slightly higher than the Chinese on the conceptual style, but there was no significant difference (even at a modest 90% confidence level) between the two Asian samples on the analytic decision style.

Finally, the Japanese scored significantly higher on the behavioral decision style than their counterparts from both the U.S. and China (see Table 8). There was no significant difference (even at a modest 90% confidence level) between the American and Chinese business leaders on the behavioral style. Comparative tests to control for differences among the national samples in education levels, years of work experience, and length of tenure confirmed the persistence of the differences.

The national differences in strategic decision making [49] are generally consistent with the existing cross-cultural literature on work values and business practices (e.g., [30,31,33,80]) as well as the scholarship that relates culture to management and IS phenomena (e.g., [15,48,51,52,67]).

As expected, the Chinese business leaders have the greatest preference for the directive style while the

Table 6
Pairwise *t*-test comparisons on analytic decision style

	Americans	Japanese	Chinese
Americans	NA		
Japanese	82.2 vs. 71.8 <i>t</i> =2.89, <i>p</i> <0.01, <i>df</i> =219	NA	
Chinese	82.2 vs. 73.0 <i>t</i> =2.58, <i>p</i> <0.01, <i>df</i> =225	71.8 vs. 73.0 <i>t</i> =1.03, <i>p</i> =0.13, <i>df</i> =168	NA

Table 7
Pairwise *t*-test comparisons on conceptual decision style

	Americans	Japanese	Chinese
Americans	NA		
Japanese	79.1 vs. 72.7 <i>t</i> =2.25, <i>p</i> =0.02, <i>df</i> =219	NA	
Chinese	79.1 vs. 67.5 <i>t</i> =3.08, <i>p</i> <0.01, <i>df</i> =225	72.7 vs. 67.5 <i>t</i> =1.93, <i>p</i> =0.03, <i>df</i> =168	NA

Japanese business leaders have the greatest preference for the behavioral style. American business leaders had a comparative preference for the analytic style and also the conceptual style.

The directive tendencies of Chinese business leaders can be attributed to their high power distance and high degree of in-group collectivism. In contrast to America's preoccupation with individual freedom, the Chinese typically seek to maintain social order through a harmony-within-hierarchy arrangement. Consequently, centralized and arbitrary (or discretionary) decisions are common in both mainland and overseas Chinese businesses (cf. [7,27,51]). Our findings suggest that the family collectivism of the Chinese does not carry over into a behaviorally oriented workplace.

The behavioral tendencies of the Japanese can be attributed largely to the high degree of institutional collectivism that prevails in Japan. In U.S. businesses, the power and responsibility for decisions tend to be vested in designated individuals. In contrast, power and responsibility in Japanese businesses tend to be shared among a group of people. This collective tendency encourages a middle-up-down process of decision making that cuts across different levels of management [61].

Comments made in the follow-up interviews suggested that the Japanese business leaders employed decision-making processes that involved comparatively more people and more subjective elements than their counterparts in the U.S. and especially China. The unique nature of every strategic decision precludes direct

Table 8
Pairwise *t*-test comparisons on behavioral decision style

	Americans	Japanese	Chinese
Americans	NA		
Japanese	58.8 vs. 71.1 <i>t</i> =3.22, <i>p</i> <0.01, <i>df</i> =219	NA	
Chinese	58.8 vs. 60.2 <i>t</i> =1.18, <i>p</i> =0.11, <i>df</i> =225	71.1 vs. 60.2 <i>t</i> =2.77, <i>p</i> <0.01, <i>df</i> =168	NA

comparisons, but most Japanese interviewees agreed that “more than ten managers” had been involved actively in “almost all” of the strategic-level decisions made in their company within the last 6 months. In contrast, both American and Chinese business leaders said that more than 10 people had been involved in “only a few” and “almost none” of their strategic decisions.

The Japanese also indicated that they took a longer time period to complete the strategic decision-making process. Whereas the American and Chinese interviewees stated that they commonly took “days” and sometimes “weeks” to make big decisions, “weeks” and “months” were common answers for the Japanese. This extra time was needed to reach a consensus. While recognizing that their decision-making processes were rather slow and deliberate process, the Japanese asserted that it “paid off” by enabling fast and smooth implementation. Remarkably, the American and Chinese business leaders both admitted that many of the decisions that they had made over the last 6 months had faced resistance, and could not be implemented as smoothly as they had hoped.

7. Implications for information systems

The existence of decision style differences raises questions about the scope of applicability for American-style IS. We assert that many conclusions reached in the U.S. about DSS and related IT applications must be reconsidered in other cultures.

7.1. Japan and China

Junior managers in Japan and China tend to use DSS for routine decision support much like their U.S. counterparts. The literature confirms that such usage is widespread in China, particularly in the state sector and for the control of operational functions, such as energy supply and distribution, transportation, and materials production. However, Chinese business leaders are less likely to rely on IT applications. Given a strong preference for social hierarchy and top-down control, strategic decisions tend to rely on informal and uncodified information channels (cf. [13,52]), quite unlike those implicit in the design of many IT-based applications.

DSS tend to fit the preference of US managers for quantitative, analytical reasoning in complex situations [52]. A Chinese business may adopt DSS to support routine types of decision making, but the use of an impersonal EIS that codifies valuable information is less likely [90]. In a study of six organizations’ usage of EIS in Hong Kong [65], the two failures occurred where

traditional Chinese management systems (as described in [51]) were in place. The business leaders preferred informal personal reporting rather than systematic online reporting. This preference was shared by the Chinese business leaders who we interviewed. Anonymous GSS might seem to offer a risk-free channel for managers to solicit feedback from their subordinates on topics of importance. However, such solicitations are rarely the action of choice for directive decision makers in China, and there is no easy way to control the tone of this feedback. Moreover, employees are likely to distrust the anonymity, believing that it is possible to identify ‘who said what’ from the underlying databases. Consequently, they will be reluctant to submit controversial ideas (which might be genuinely useful) due to a fear of losing their job — a very real fear in a culture where relationships are critical.

Nevertheless, an EIS is not totally incompatible with the management of information and knowledge in Chinese business [7,52]. An EIS can undeniably be used to improve executive-level decision making, even in China (e.g., [65,89]). Western partners in Sino-foreign joint ventures may also encourage DSS and EIS use. However, these IS may be resisted unless the Chinese managers have overseas experience, and are comfortable with non-Confucian value systems.

Meanwhile, the preference for a behavioral approach by Japanese managers favors wide access to EIS and the selective adoption of GSS [82,84]. However, these systems should strive to maintain within-group harmony: there is always the risk that uninhibited anonymous brainstorming in a GSS can lead to flaming and a destruction of harmony. Many Japanese business leaders reported using Lotus Notes and similar software. These applications help to achieve decisional congruence by enabling information/knowledge sharing and informal feedback from employees. However, the Japanese preference for verbal over textual cues, as well as the preference for *nemawashi* or “behind-the-scenes negotiations” [82], limits the speed and scope of EIS and GSS adoption.

Japanese business leaders may favor non-traditional IT applications such as mobile phones that can transmit verbal cues effectively and better reflect the nuances of their high-context culture [25]. Smart phones, with built-in cameras for multimedia messaging, have been received favorably. However, Wolfe [84] describes a GSS designed specifically for the *nemawashi/ringi* style of negotiated conversation-based consensus formation (*ringi*) and decision making. This suggests that certain types of computer-based applications may be feasible in the Japanese context.

Table 9
Hofstede’s classification based on Societal Value Scores [30]

	High	Low
Power distance	Anglo	Chinese Japanese
Individualism	Anglo	Japanese/Chinese
Uncertainty avoidance	Anglo/Chinese	Japanese
Masculinity	Japanese ^a	
Long-term orientation	Japanese/Chinese	Anglo

^a Anglo and Chinese societies score near the medium on this dimension.

Several of the Japanese business leaders that we interviewed, including those at the helm of the Mitsubishi and Sumitomo corporate groups, belonged to IT-enabled knowledge communities. These communities tend to emphasize peer-to-peer knowledge sharing, but sometimes cutting across different levels of organizational hierarchy. As a complement to the more traditional high-context communities based on face-to-face communication, these IT applications encourage the exchange of fresh ideas and advice. They are most useful for complex and difficult decisions, supporting both the generation and selection of alternatives. They are also useful for identifying the relevant factors in important decisions that involve multiple members of the community, and subsequently to obtain and confirm agreement on these decisions.

With Asians generally scoring high on collectivism, it is not surprising that the decision-making styles of both Japanese and Chinese business leaders tend to focus on collective interests, emphasize relationships and intuition (at the expense of factual analysis), and discourage conflicting views that would threaten group harmony or the face of the individual [29]. Significantly, the Chinese business leaders who were interviewed tended to agree (mostly very strongly) that the transparency and autonomy facilitated by DSS, GSS and EIS would not be appreciated. They suggested that they and their management peers in China valued the discretion to disregard some decision criteria while weighting the relative importance of others based on their personal judgment and past experience.

The overall results are consistent with the view offered by Fukuda [23] that the Japanese are a block of granite, with a strong sense of organizational collectivism, while the Chinese are like grains of sand, with a natural hierarchy and collectivism at the family or small group level. This distinction is not only consistent with the GLOBE scores of Japan and China on the two dimensions of collectivism, but it also has face validity. The prevailing emphasis of the respondents who introduced themselves to the lead author was as follows: first name (individual) for the Americans, family name

(in-group collective) for the Chinese, and employer name (institutional collective) for the Japanese.

The directive-behavioral dichotomy between the Chinese and the Japanese may also result from the greater acceptance of tacit knowledge management in Japan (see [7,17]). The Japanese have developed the capacity to work together in harmony [62] and thus group welfare outweighs individual needs whereas knowledge remains a personal or family-based source of power in China [7,52].

7.2. Anglo and Far Eastern/Confucian cultural clusters

Several cross-cultural scholars have clustered the world’s societies based upon the similarities and differences of their cultural values. For example, Hofstede [30] reported that other Anglo societies such as Australia, Canada and the United Kingdom had scores similar to the U.S. on all of his cultural dimensions (see Table 9). Meanwhile, the Chinese-dominated societies of Hong Kong, Singapore and Taiwan were grouped with Thailand and the Philippines in a Far Eastern cluster. Significantly, Japan did not cluster with any other country due to its very high scores on both UA and MAS.

More recently, the GLOBE study [34] found empirical support for the following ten society clusters: Anglo, Latin Europe, Nordic Europe, Germanic Europe, Eastern Europe, Latin America, Sub-Saharan Africa, Middle East, Southern Asia, and Confucian Asia (see Table 10). The Anglo cluster includes Australians, the

Table 10
GLOBE’s cultural clusters based on societal practices (as-is) scores adapted from [34]

Dimension	High-score clusters	Mid-score clusters	Low-score clusters
Uncertainty avoidance	Nordic Europe Germanic Europe	Anglo Confucian Asia Southern Asia Sub-Saharan Africa Latin Europe	Middle East Latin America Eastern Europe
Institutional collectivism	Confucian Asia Nordic Europe	Anglo Southern Asia Sub-Saharan Africa Middle East Eastern Europe	Germanic Europe Latin Europe Latin America
In-group collectivism	Confucian Asia Southern Asia Middle East Eastern Europe Latin Europe	Sub-Saharan Africa Latin Europe	Anglo Germanic Europe Nordic Europe

Data in bold are the focus of this study.

English, the Irish, white South Africans, New Zealanders as well as most North Americans. Remarkably, in contrast to Hofstede [30], the GLOBE study identified a Confucian Asia cluster which includes China, Korea and Japan.

Given this cultural clustering, our study has important implications for DSS beyond the U.S., Japan and China. If indeed the decision styles of business leaders in other Anglo clusters are similar to those in the U.S., then the DSS designed for Americans may also be well suited for other Anglo business leaders. Given their comparatively strong individualism, Anglo leaders will tend to perceive events as effects of a cause or causes which can in turn be attributed to specific agents. For example, they would “analyze” the personality of a potential employee before making a hiring decision.

In contrast, East Asian business leaders are more likely to “consider” situational factors, such as the background and relationships of the applicant, rather than merely their personality, before making a similar decision. Most of the Chinese and Japanese business leaders that were interviewed agreed that they would be more interested in who the person knew (their relationships) rather than what they knew (skills and technical knowledge). In terms of doing business, all but one of the Chinese mentioned the importance of “being able to trust” the person at the other end of the transaction, an issue that was raised by less than half the Japanese interviews and only one American.

Traditional IT applications are better suited to support narrowly defined analytic processes than more holistic decision making [48,52]. Therefore, Chinese business leaders may resist many mainstream decision support tools that originated in the U.S. in much the same way that established Chinese organizations have failed to embrace enterprise resource planning (ERP) systems (cf. [50]). However, IT applications which are peripherally relevant to formal and systematic decision making, such as PDAs and mobile phones, may be adopted more readily. Their portability fits with the people-oriented and “mobile” decision-making processes that are common in East Asian cities.

More generally, IT applications tend to rule out contradictions. This is consistent with Western logic going back to Aristotle [48], and so even a question about the legitimacy of contradictions exposes a culture-bound Western perspective. However, many business people in East Asia perceive contradiction to be useful for more fully understanding relationships between objects and events. Japanese management philosophy, for instance, is extensively influenced by Zen, where diametrically opposite states are easily reconcilable

[28]. In general, however, it is impossible to program a DSS application to accept contradictions and to process them logically and consistently. Indeed, the very notion of consistency is to try and control the contradictions, which is a preoccupation in Western business and society [52].

Contrary to the high degree of cultural similarity across East Asia that has been highlighted in several recent studies (see [34,80]), we found a stark difference in the decision styles of Japanese and Chinese business leaders. This indicates that even within a cultural grouping, like the Confucian Asia cluster proposed by House et al. [34], there may be significant variations in decision styles and the optimal design of DSS. The existence of such a variation is not only supported by our quantitative data, but also by the existing literature and the perceptions of nearly all of the Chinese and Japanese business leaders that we interviewed. The Asian business leaders invariably asserted that the common way to make strategic decisions in their own country (whether Japan or China) differed significantly from that prevailing on the other side of the Sea of Japan or East China Sea.

According to the literature, Japanese managers strive for Zen-oriented perfection through elaborate and extensive, but often informal, face-to-face *nemawashi* or discussions that frustrate their Western counterparts [28]. In contrast, Chinese managers tend to prefer a less participatory and more autocratic management style that concentrates discretionary power in the hands of the very few. Japanese managers are not particularly democratic, but they are inclined to listen to co-workers from the shop floor upwards before reaching a decision. Nevertheless, when confronted with a lot of data, Chinese managers will apply a DSS so as to process the data efficiently, yet at the same time will weight different options (or perspectives) using personal discretion.

8. Opportunities for further research

The discovery of distinctive American, Japanese and Chinese styles of strategic decision making has implications for the application of DSS and related types of IS. It also suggests opportunities for further research to advance our understanding of this topic and related ones.

The theory underpinning our study relied primarily on four dimensions of culture — power distance, individualism/collectivism, uncertainty avoidance, and performance orientation. Other dimensions of culture, such as the concept of time orientation identified by Bond and his colleagues [11], were not considered

explicitly. However, these dimensions may also influence both the process of decision making and the IS used to support this process. For example, a higher long-term orientation score for a society suggests that its members will be more patient, not only taking the time to both make the right decision, but also ensuring that the choice is supported by those who have to implement the decision. Such a participatory process may favor the use of GSS.

In contrast, the prevailing tendency in societies with a short-term orientation is to select alternatives that offer short-term gains (e.g., immediate consumption) even if they are sub-optimal in the long term. Information systems that speed up the decision-making process and help to identify “quick pay-off” alternatives may be favored in these contexts. Therefore, dimensions such as time orientation cannot be ignored in developing a comprehensive understanding of different decision-making processes and how IT applications can support them.

Finer grained studies of decision making in different parts of the world are also needed. We encourage further research that would not only enrich our understanding of the Japanese and Chinese contexts, but also go beyond the U.S., Japan and China. It is important to know how different business managers make different types of decisions so that IS can be designed or adapted to meet their needs. For example, a resource allocation decision is likely to involve a different decision process than one associated with handling a personnel conflict or an entrepreneurial venture.

With the rapid rate of economic development taking place in China, we would expect to see differences between younger and better educated private sector managers and older managers with fewer years of formal education. There are also reasons to believe that private venture leaders may make more use of decision support tools than their counterparts in state-controlled enterprises. Given the prevalence of state enterprises in China’s economy (and our sample of Chinese leaders), it may be appropriate to study separately the up-and-coming Chinese business leaders who will likely dominate the Chinese economic landscape in the decades to come [40]. Looking beyond DSS, we also need to investigate to the extent to which East Asian managers rely on what has come to be called “business intelligence”, and how, if at all, they formalize this in computer-based IS.

Further research also needed to examine the *effectiveness* of different decision styles and decision support tools in different situations. The adaptability of business leaders (and other decision makers) in terms of both handling various situations and effectively using

different decision support tools also merits more study. The extent to which these national differences will persist is another interesting question, especially given that younger business leaders tend to be exposed to more foreign influences and are often less technophobic [81]. More generally, there is a need to further examine and explain international differences in fundamental management activities, such as decision making, and the IT applications that support them.

9. Conclusions

American, Japanese and Chinese business leaders each have a distinctive decision-making style. In the absence of evidence to the contrary, we hypothesize that these national differences in prevailing decision styles will extend to other levels of managers. These differences need to be recognized, and the reasons underlying them understood, in order to develop and deploy effective DSS.

American business leaders have a decision style that reflects a comparatively higher need for achievement. Business leaders in the U.S. tend to be more performance oriented [34], and make decisions that either respond to challenges or create opportunities for their efforts to be recognized and praised by others. More generally, American managers have a tendency to “analyze” situations and/or “conceptualize” potential solutions. This mindset encourages a structured and formalized decision-making process. Such a process benefits from the use of DSS, GSS, EIS and other types of information systems that make data analysis more efficient and standardized [49,52]. The objective and specific nature of digitally codified information, even if it is compressed or filtered, also diminishes the impact of interpersonal relationships and individual discretion [52].

In contrast, the needs for affiliation and personal power are comparatively more important to Japanese and Chinese business leaders, respectively. This raises doubts about the direct transfer to Japan and China of the IT applications that support strategic decision making in the United States.

Japanese business leaders tend to favor decision-making outcomes that preserve already established relationships or help to cultivate new ones. Group-oriented IT applications, such as Lotus Notes, that support interpersonal communications and encourage tacit knowledge sharing will be more helpful than DSS that codify data and explicitly model relationships between key variables.

However, the comparatively high degree of cultural homogeneity in Japan (reflected in the “block of granite”

metaphor) suggests that a DSS designed for one Japanese manager will be quite useful to others without significant customization. Meanwhile, the strong Japanese need for affiliation will limit management's ability to change the social structure of a business network in response to an emerging competitive challenge.

In contrast, the ability to maintain power, and to exercise it, will be a very prominent consideration in the decisions made by Chinese business leaders. IT applications that focus on the bottom-up aggregation of data and the top-down communication of decisions will be appropriate. In a Sino–U.S. joint venture, the desire of Chinese managers to maintain a high degree of control could become a source of conflict. American managers will likely try to change the organizational power structure in order to dramatically improve business performance.

Enduring differences in decision-making tendencies continue to hinder the global transfer of management knowledge. Business leaders who prefer to make decisions in different ways are unlikely to accept a universal set of management principles or “best” practices. Thus, a global IS must have the flexibility to accommodate different decision styles and decision-making processes. IT applications such as DSS, GSS and EIS need to fit the decision styles of their intended users. This technological adaptation will be most critical when the local culture differs from that prevailing in America.

References

- [1] N.R. Abramson, R.J. Keating, H.W. Lane, Cross-national cognitive process differences: a comparison of Canadian, American and Japanese Managers, *Management International Review*, vol. 36, 1996, pp. 123–147.
- [2] C. Anderson, Values-based management, *Academy of Management Executive* 11 (4) (1997) 25–46.
- [3] S. Ba, K.R. Lang, A.B. Whinston, Enterprise decision support using intranet technology, *Decision Support Systems* 20 (2) (1997) 99–134.
- [4] B.M. Bass, *Leadership and Performance Beyond Expectations*, Free Press, New York, 1985.
- [5] M. Bazerman, *Judgment in Managerial Decision Making*, 6th edition, John Wiley and Sons, Hoboken, NJ, 2006.
- [6] J. Boulgarides, D. Oh, A comparison of Japanese, Korean and American managerial decision styles: an exploratory study, *Leadership & Organizational Development Journal* 6 (8) (1985) 9–11.
- [7] G.R. Burrows, D.L. Drummond, M.G. Martinsons, Knowledge management in China, *Communications of the ACM* 48 (4) (2005) 73–76.
- [8] M. Chen, *Asian Management Systems: Chinese, Japanese, and Korean Styles of Business*, Routledge, London, 1995 (New York).
- [9] Z.M. Chen, Y. Tang, The realization of a knowledge-based material management decision support system in a cement plant, *Journal of Wuhan University of Technology* 20 (3) (1998) 92–94.
- [10] J. Child, *Chinese Management During the Age of Reform*, Cambridge University Press, Cambridge, UK, 1994.
- [11] Chinese Culture Connection, Chinese values and the search for culture-free dimensions of culture, *Journal of Cross-Cultural Psychology* 18 (2) (1987) 143–164.
- [12] R.M. Davison, GSS and action research in the Hong Kong Police Force, *Information Technology and People* 14 (1) (2001) 60–77.
- [13] R.M. Davison, E. Jordan, Group support systems: barriers to adoption in a cross-cultural setting, *Journal of Global Information Technology Management* 1 (2) (1998) 37–50.
- [14] R.M. Davison, M.G. Martinsons, Empowerment or enslavement: a case of process based organisational change in Hong Kong, *Information Technology and People* 15 (1) (2002) 42–59.
- [15] R.M. Davison, M.G. Martinsons, Cultural issues and IT management: past and present, *IEEE Transactions on Engineering Management* 50 (1) (2003) 3–7.
- [16] R.M. Davison, D.R. Vogel, Group support systems in Hong Kong: an action research project, *Information Systems Journal* 10 (1) (2000) 3–20.
- [17] J.E. Dutton, Interpretations on automatic: a different view of strategic issue diagnosis, *Journal of Management Studies* 30 (3) (1993) 339–357.
- [18] P. Earley, Social loafing and collectivism: a comparison of the United States and the People's Republic of China, *Administrative Science Quarterly* 34 (4) (1989) 565–581.
- [19] J.J. Elam, D.G. Leidner, EIS adoption, use and impact: the executive perspective, *Decision Support Systems* 14 (2) (1995) 89–103.
- [20] G.W. England, Personal value systems of American managers, *Academy of Management Journal* 10 (1967) 53–68.
- [21] S. Feng, L.X. Li, Z.G. Duan, J.L. Zhang, Assessing the impacts of south-to-north water transfer project with decision support systems, *Decision Support Systems* (in press), doi:10.1016/j.dss.2004.11.004.
- [22] J.W. Frederickson, Effects of decision motive and organizational performance level on strategic design processes, *Academy of Management Journal* 28 (4) (1985) 821–843.
- [23] K.J. Fukuda, Japanese and Chinese business practices: uncovering the differences, *Mid-Atlantic Journal of Business* 21 (2) (1983) 35–44.
- [24] W. Guo, K.C. Wei, X. Li, F.Q. Wang, A decision support system for automotive product planning and competitive market analysis, *International Transactions in Operations Research* 7 (2000) 509–523.
- [25] E.T. Hall, *Beyond Culture*, Doubleday, New York, 1976.
- [26] E.T. Hall, M.R. Hall, *Hidden Differences: Doing Business with the Japanese*, Doubleday, New York, 1987.
- [27] C.L. Hamrin, S. Zhao, *Decision-making in Deng's China: Perspectives from Insiders*, M.E. Sharpe, Armonk, NY, 1995.
- [28] R. Heller, *Commitment: Zen and the Art of Management*, <http://www.thinkingmanagers.com/management/commitment.php>, 2006.
- [29] D.Y.F. Ho, On the concept of face, *American Journal of Sociology* 81 (4) (1976) 867–884.
- [30] G. Hofstede, *Culture's Consequences: International Differences in Work-related Values*, Sage, London, 1980.
- [31] G. Hofstede, *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations*, Sage, London, 2001.
- [32] G. Hofstede, M.H. Bond, The Confucius connection: from cultural roots to economic growth, *Organizational Dynamics* 16 (4) (1988) 5–21.

- [33] R.J. House, A 1976 theory of charismatic leadership, in: J.G. Hunt, L.L. Larson (Eds.), *Leadership: The Cutting Edge*, Southern Illinois University Press, Carbondale, IL, 1977, pp. 189–209.
- [34] R.J. House, P.J. Hanges, M. Javidan, P.W. Dorfman, V. Gupta, *Culture, Leadership and Organizations: The GLOBE study of 62 Societies*, Sage, Thousand Oaks, CA, 2004.
- [35] R.J. House, M. Javidan, P. Hanges, P. Dorfman, Understanding cultures and implicit leadership theories across the globe, *Journal of World Business* 37 (1) (2002) 3–10.
- [36] R.J. House, N.S. Wright, R.N. Aditya, Cross-cultural research on organizational leadership, in: P.C. Earley, M. Erez (Eds.), *New Perspectives on International Industrial/Organizational Psychology*, New Lexington Press, San Francisco, 1997, pp. 535–635.
- [37] F.L.K. Hsu, *Americans and Chinese: Purpose and Fulfillment in Great Civilizations*, Natural History Press, New York, 1970.
- [38] S.Y. Hung, T.P. Liang, Effect of computer self-efficacy on the use of executive support systems, *Industrial Management and Data Systems* 101 (5) (2001) 227–236.
- [39] Y.P. Huo, D.M. Randall, Exploring subcultural differences in Hofstede's value survey: the case of the Chinese, *Asia-Pacific Journal of Management* 8 (2) (1991) 159–164.
- [40] T. Inoguchi, The coming Pacific century? *Current History* 93 (579) (1994) 25–30.
- [41] C. Jung, *Psychological Types*, Pantheon Books, New York, 1959.
- [42] T. Kagano, I. Nonaka, K. Sakakibara, A. Okumura, *Strategic vs. Evolutionary Management: A U.S.–Japan Comparison of Strategy of Management*, North-Holland, Amsterdam, 1985.
- [43] T. Kasser, R. Koestner, N. Leikes, Early family experiences and adult values: a 26-year, prospective longitudinal study, *Personality & Social Psychology Bulletin* 28 (6) (2002) 826–835.
- [44] M. Khalifa, R.C.W. Kwok, R.M. Davison, The effects of process and content facilitation restrictiveness on GSS-mediated collaborative learning, *Group Decision and Negotiation* 11 (5) (2002) 345–361.
- [45] T. Kosaka, The first investigation of executive information systems practices in Japanese firms, *Proceedings of the TIMS/ORMA Conference*, Boston, 1994.
- [46] N.H. Leonard, R.W. Scholl, K.B. Kowalski, Information processing style and decision making, *Journal of Organizational Behavior* 20 (1999) 407–420.
- [47] S. Lowe, Hermes revisited: a replication of Hofstede's study in Hong Kong and the UK, *Asia Pacific Business Review* 2 (3) (1996) 101–119.
- [48] M.G. Martinsons, Management philosophy and IT assimilation: the east–west divide, *Journal of Technology Management* 18 (3) (1991) 207–218.
- [49] M.G. Martinsons, Comparing the decision styles of American, Chinese and Japanese business leaders, *Best Paper Proceedings of the Academy of Management Meetings*, Washington, DC, 2001.
- [50] M.G. Martinsons, ERP in China: one package, two profiles, *Communications of the ACM* 47 (7) (2004) 65–68.
- [51] M.G. Martinsons, P.S. Hempel, Chinese management systems: historical and cross-cultural perspectives, *Journal of Management Systems* 7 (1) (1995) 1–11.
- [52] M.G. Martinsons, R.I. Westwood, Management information systems in the Chinese business culture: an explanatory theory, *Information & Management* 32 (5) (1997) 215–228.
- [53] D.C. McClelland, Business drive and national achievement, *Harvard Business Review* 40 (4) (1962) 99–112.
- [54] B.C. McNurlin, R.H. Sprague, *Information Systems Management in Practice*, 6th Ed., Prentice Hall, Englewood Cliffs, NJ, 2004.
- [55] S. Mei, W.J. Zhong, Information requirement analysis for executive information systems, *Journal of Southeast University* 4 (5) (2002) 42–45.
- [56] X. Meng, R.G. Gregory, The impact of interrupted education on subsequent educational attainment: a cost of the Chinese cultural revolution, *Economic Development and Cultural Change* 50 (4) (2002) 935–959.
- [57] D.M. Messick, Alternative logics for decision making in social settings, *Journal of Economic Behavior and Organization* 39 (1) (1999) 11–28.
- [58] I.I. Mitroff, R.H. Kilmann, *Methodological Approaches to Social Science: Integrating Divergent Concepts and Theories*, Jossey-Bass, San Francisco, 1978.
- [59] H. Nagashima, *A Reversed World or Is It? The Japanese Way of Communicating and Their Attitudes Towards Other Cultures*, Ritsumeikan University Press, 1993.
- [60] R.F. Nisbett, *The Geography of Thought: How Asians and Westerners Think Differently — and Why*, Free Press, New York, 2004.
- [61] I. Nonaka, Toward middle–up–down management: accelerating information creation, *Sloan Management Review* 29 (3) (1988) 9–18.
- [62] W. Ouchi, *Theory Z: How American Business Can Meet the Japanese Challenge*, Addison-Wesley, Reading, MA, 1981.
- [63] V.M. Papadakis, S. Lioukas, D. Chambers, Strategic decision making processes: the role of management and context, *Strategic Management Journal* 19 (2) (1998) 115–147.
- [64] R.T. Pascale, Communication and decision making across cultures: Japanese and American comparisons, *Administrative Science Quarterly* 23 (1978) 91–110.
- [65] P.P. Poon, J.C. Wagner, Critical success factors revisited: success and failure cases of information systems for senior executives, *Decision Support Systems* 30 (4) (2001) 393–418.
- [66] R.E. Potter, P.A. Balthazard, Supporting integrative negotiation via computer mediated communication technologies: an empirical example with geographically dispersed Chinese and American negotiators, *Journal of International Consumer Marketing* 12 (4) (2000) 7–32.
- [67] D.A. Ralston, D.H. Holt, R.H. Terpstra, K.-C. Yu, The impact of national culture and economic ideology on managerial work values: a study of the United States, Russia, Japan, and China, *Journal of International Business Studies* 28 (1) (1997) 177–207.
- [68] S.P. Robbins, *Management*, 6th edition, Prentice Hall, Englewood Cliffs, NJ, 1999.
- [69] S.P. Robbins, *Managing Today!* 2nd edition, Prentice Hall, Englewood Cliffs, NJ, 1999.
- [70] D. Robey, W. Taggart, Measuring managers' minds: the assessment of style in human information processing, *Academy of Management Review* 6 (1981) 375–383.
- [71] A.J. Rowe, J.D. Boulgarides, Decision styles — a perspective, *Leadership and Organization Development Journal* 4 (4) (1983) 3–9.
- [72] A.J. Rowe, J.D. Boulgarides, *Managerial Decision Making*, Prentice-Hall, Englewood Cliffs, NJ, 1994.
- [73] C. Schwenk, Strategic decision making, *Journal of Management* 21 (3) (1995) 471–493.
- [74] H.A. Simon, *The New Science of Management Decision*, Harper and Row, New York, 1960.
- [75] M.M.C. Tam, W.W.C. Chung, K.L. Yung, A.K. David, K.B.C. Saxena, Managing organizational DSS development in small manufacturing enterprises, *Information & Management* 26 (1) (1994) 33–47.

- [76] Q.J. Tian, J. Ma, J.Z. Liang, R.C.W. Kwok, O. Liu, An organizational decision support system for effective R&D project selection, *Decision Support Systems* 39 (3) (2005) 403–413.
- [77] J. Tian, Y.L. Wang, H.Z. Li, L. Li and K.L. Wang, DSS development and applications in China, *Decision Support Systems* (in press), doi:10.1016/j.dss.2004.11.009.
- [78] H.C. Triandis, Collectivism vs. individualism: a reconceptualization of a basic concept in cross-cultural psychology, in: G.K. Verma, C. Bagley (Eds.), *Cross-cultural Studies of Personality, Attitudes and Cognition*, Macmillan, London, 1988, pp. 60–95.
- [79] H.C. Triandis, *Individualism and Collectivism*, Westview Press, Boulder, CO, 1995.
- [80] F. Trompenaars, *Riding the Waves of Culture: Understanding Diversity in Global Business*, Nicholas Brealy, London, 1993.
- [81] Q. Tu, K.L. Wang, Q. Shu, Computer-related technostress in China, *Communications of the ACM* 48 (4) (2005) 77–81.
- [82] K. Watabe, C.W. Holsapple, A.B. Whinston, Coordinator support in a Nemawashi decision process, *Decision Support Systems* 8 (2) (1992) 85–98.
- [83] A.M. Whitehill, *Japanese Management: Tradition and Transition*, Routledge, London, 1992.
- [84] M.D. Wolfe, A theoretical justification for Japanese Nemawashi/Ringi group decision making and an implementation of a Nemawashi/Ringi group decision support system, *Decision Support Systems* 8 (2) (1992) 125–140.
- [85] Y. Xiang, T.Y. Huang, Study on theory framework of DSS intelligent construction model based on management problem comprehension, *Journal of Management Sciences in China* 2 (3) (1999) 51–58.
- [86] X.X. Xu, K.L. Wang, Y.M. Xi, Y.L. Wang, The study of anonymous intensity in group support system (GSS), *Journal of Management Science in China* 1(2) (1998) 57–61, 97.
- [87] R.S. Yeh, On Hofstede's treatment of Chinese and Japanese values, *Asia Pacific Journal of Management* 6 (1) (1988) 149–160.
- [88] S. Yurimoto, T. Masui, Design of a decision support system for overseas plant location in the EC, *International Journal of Production Economics* 41 (1995) 411–418.
- [89] L. Yang, Z.G. Dong, Study on improving the quality of top executives, *China Aero Information* 2 (1999) 22–23.
- [90] B.X. Zhang, I.O. Angell, Decision support systems in China: a clash of cultures, *Information Technology for Development* 5 (2) (1990) 137–155.



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