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Jon Heales  
*University of Queensland*

Sophie Cockcroft  
*University of Queensland*

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# THE INFLUENCE OF NATIONAL CULTURE ON THE LEVEL AND OUTCOME OF IS DECISION MAKING IN THE IS EVOLUTION/REDEVELOPMENT DECISION

**Jon Heales**  
University of Queensland  
[j.heales@business.uq.edu.au](mailto:j.heales@business.uq.edu.au)

**Sophie Cockcroft**  
University of Queensland  
[s.cockcroft@business.uq.edu.au](mailto:s.cockcroft@business.uq.edu.au)

## Abstract

*Would the outcome of a Global multinational organization's decision be the same if the same decision were to be made in different countries throughout the world? Within the same organization, we propose that national cultural differences can influence decision making in different countries and cultural clusters. While much work has been done on organizational cultural influences, this study examines the influence that national culture has on organizational decision making in respect to the evolution/redevelopment decision that organizations face when a system is believed to be entering the obsolescence phase. Building on findings from the Globe research program, we show by empirical testing of a theoretical model that national cultural dimensions are significantly associated with a) the outcome of the decision to enhance or re-develop a system, and b) the organizational level at which such decisions are made. This research is significant as a means to improve management decision making, particularly with regard to the enhancement versus re-development decision. The research suggests that a relatively uniform sub-culture exists across the global IS project level but that national cultural dimensions play a more important role in determining the organizational management level at which decisions are made.*

**Keywords:** Organizational culture, national culture, leadership, decision making, information system maintenance, information systems evolution, globe project

## Introduction

We examine the influence national cultural dimensions have on aspects of information systems' evolution and development. The impact of culture on organizational processes and decisions has attracted growing interest, particularly over the last decade, when global software development has become a reality (IEEE, 2001). This trend has raised a number of issues arising from the physical separation of systems development and maintenance from company operations (Herbsleb and Moitra, 2001). The outsourcing of development tasks for reasons of economy has become common (Nicholson and Sahay, 2001), so awareness of how cultural issues in this environment may impact IS evolution and development is very important, particularly where the management of IS is geographically separated from other company operations.

A significant amount of work has been conducted into cultural influences, see Myers and Tan (2002) for a summary of research on national culture in IS, but little has been done on the influence culture has on system development and maintenance (Krumbholz and Maiden, 2001; Ein-Dor, et al., 1993). Ralston, et al. (1992) noted that managers who face uncertain situations are likely to fall back on their value systems to make decisions, therefore understanding the values of business associates is an important step in building a good cross-national business relationship (Tung and Miller, 1990). Javidan and House (2002) point out that globalization does not mean cultural differences are disappearing or diminishing, and cite findings from Doug Ivestor, the former CEO of Coca-Cola Corporation who pointed out that as economic boundaries disappear, cultural barriers go up.

Herbsleb and Moitra (2001) highlighted cultural issues affecting information systems, including differences in the need for structure, attitudes toward hierarchy, sense of time, and communication styles. For example, Krumbholz and Maiden (2001) examined the differences in Uncertainty Avoidance (UA) between the UK and Sweden. They found that in the UK (higher UA) the main problem arising from poor screen layout was seen to be difficulty of fast accurate data entry, whereas in Sweden the same problem prompted concerns about customer service. We believe these cultural influences apply equally well in the evolutionary environment as they do in the development environment because staffing mixes, organisational location of the evolutionary group, and the nature of work undertaken by the evolutionary group is likely to be similar to that of the development group.

## **Software and Culture**

We seek to examine the effects that national culture has on leadership and decision-making processes regarding a system's enhancement or re-development. Because culture is so pervasive and enduring (Ott, 1989), it provides ongoing influence over leadership and decision making in organizations, especially in those countries that have cultural dimension values at the extremes. Some organizations, such as IBM, Corning and Honeywell, have taken advantage of cultural diversity and have even experimented with harnessing its characteristics to meet business objectives (Galen, 1994).

Javidan and House (2002) point out that cross-cultural research can also provide insights to executives facing global challenges. To be useful though, they emphasize cross-cultural research must be based on sound theory and tested using large-scale samples in a variety of cultures.

## **Organizational Culture and National Culture**

From the viewpoint of business, two main cultural classifications are seen to be important, organizational culture and national culture. Organizational culture is pervasive throughout an organization and has been seen to have effects on the way decisions are made and the levels at which those decisions are made (Ott, 1989). Terpstra and David (1991) showed that organizational cultures are influenced by national culture, and the greater the cultural differences between countries, the greater the difference between organizations' attitudes and practices (Datta and Puia, 1995; Kogut and Singh, 1988). This paper focuses on the effect that national culture has on the decision making processes relating to IT within organizations.

### ***National Culture Defined***

Seminal work in the area of national culture was undertaken by Hofstede (2001) whose definition<sup>1</sup> of national culture provided some strong implications for organizational decision making and IS development and enhancement because national culture causes individuals to prefer certain activities to others (Hofstede, 2001). Cultural influences are assimilated early in life and have an ongoing influence (Ott, 1989). Hofstede's, (1980) cultural dimensions have been widely accepted and used in IS research (e.g., Robbins and Stylianou, 2002; Steinwachs, 1999). However, Fernandez, et al. (1997) questioned their applicability 25 years on, and suggested that shifts in Hofstede's (1980) country classifications have occurred.

### ***Challenges to the Notion of National Culture***

Myers and Tan (2002) have argued for a departure from the use of models of national culture as a tool to explain information systems phenomena. Their arguments centred on the practice of associating a nation state with a culture, the heterogeneity of culture within such nation states, the use of culture as a means of differentiating one group of people from another as an outdated concept, and the notion that culturally influenced work related values are not related in a straightforward manner to national culture.

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<sup>1</sup>Hofstede defines national culture as: "National culture is the collective programming of the mind which distinguishes the inhabitants of one country from another. Basic values and beliefs are acquired early in life, through socialization and education and this way inhabitants of a country come to share certain basic beliefs and assumptions and the tendency to prefer certain states of affairs over others."

Walsham (2002) suggested the use of structuration analysis to provide a deeper examination of cross cultural working within IS. Structuration theory can be used to analyze cross-cultural conflict and contradiction, cultural heterogeneity, detailed work patterns and the dynamic nature of culture. Although structuration promises to offer a complementary approach to more quantitative approaches based on Hofstede and other models, this paper adopts a conventional research methodology.

**Project GLOBE**

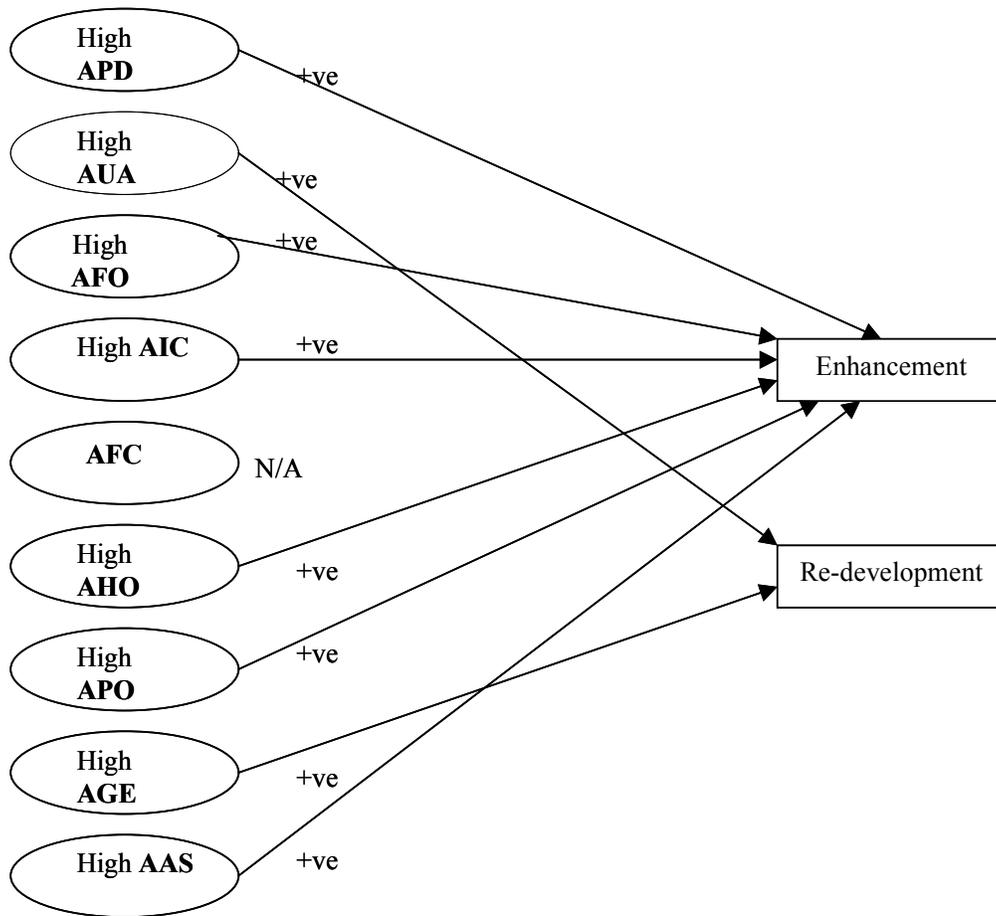
The 2002 Special Issue of the Journal of World Business (Vol. 37 (1)) details progress of the GLOBE Project which was initiated in 1995 and is a multiphase, multi-method project in which investigators spanning the world are examining interrelationships between societal culture, organizational culture, and organizational leadership. Representation includes close to 150 social scientists and management scholars from 61 cultures who are engaged in this long-term programmatic series of cross-cultural leadership studies (House, et al., 2002). The approach taken by Globe builds to a large extent on Hofstede's dimensions, but the methods used, the broadening of the scope of inquiry, and the view taken to cluster countries into cultural clusters mitigates many of the criticisms raised against the use of Hofstede's dimensions, including those raised by Myers and Tan (2002). In the absence of more appropriate dimensions we choose to use those emanating from the Globe project. Table 1. details the Globe cultural dimensions and variable names (House, et al., 2002). We use the "As Is" scores rather than "Should Be" scores because they represent reality and the outcomes of real-world decisions, rather than espoused values.

**Table 1. Globe Cultural Dimensions**

<i>Dimension Sources</i>	<i>Globe Dimensions</i>	<i>Variable Name</i>	<i>Definition</i>
<i>Power Distance</i> (Hofstede, 1980)	<i>Power Distance</i>	APD	Degree to which members of an organization or society expect and agree that power should be unequally shared.
<i>Uncertainty Avoidance</i> (Hofstede, 1980)	<i>Uncertainty Avoidance</i>	AUA	Extent to which members of an organization or society strive to avoid uncertainty by reliance on social norms, rituals, and bureaucratic practices to alleviate the unpredictability of future events.
	<i>Future Orientation</i>	AFO	Degree to which individuals in organizations or societies engage in future-oriented behaviors such as planning, investing in the future, and delaying gratification.
<i>Individualism</i> (Hofstede, 1980)	<i>Institutional Collectivism</i>	AIC	Degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action.
<i>Individualism</i> (Hofstede, 1980)	<i>Family Collectivism</i>	AFC	Reflects the degree to which individuals express pride, loyalty and cohesiveness in their organizations or families.
<i>Kind Heartedness</i> (Hofstede and Bond, 1988)	<i>Humane Orientation</i>	AHO	Degree to which individuals in organizations or societies encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others.
<i>Confucian Dynamism</i> (Hofstede and Bond, 1988)	<i>Performance Orientation</i>	APO	Extent to which an organization or society encourages and rewards group members for performance improvement and excellence. This dimension includes the future oriented component of the dimension called Confucian Dynamism by (Hofstede and Bond, 1988).
<i>Masculinity</i> (Hofstede, 1980)	<i>Gender Egalitarianism</i>	AGE	Extent to which an organization or a society minimizes gender role differences and gender discrimination.
	<i>Assertiveness</i>	AAS	Degree to which individuals in organizations or societies are assertive, confrontational, and aggressive in social relationships.

### Cultural Influences on Decision Making

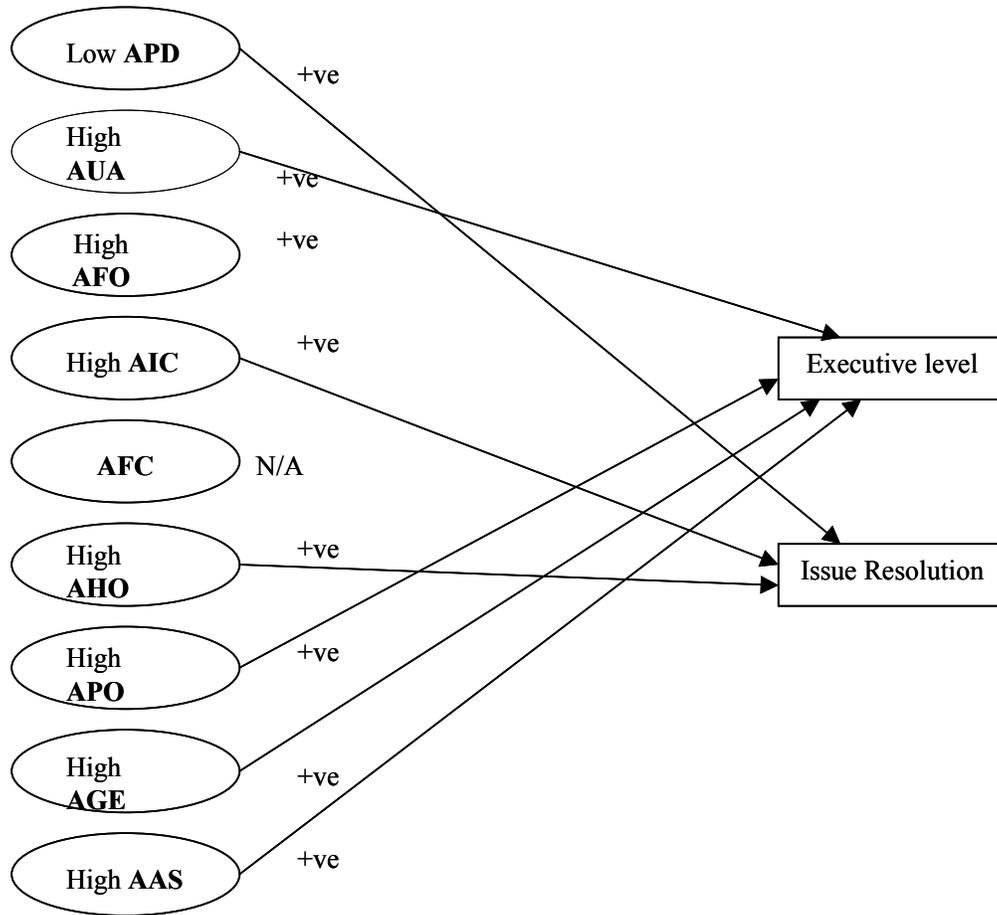
During the evolutionary phase of an information system, the information system ages and organizational requirements change. Provided the needs of users continue to be met, the information system remains stable and is unlikely to be replaced (Heales, 2000; Heales, 2002). However, as the system becomes incapable of meeting and catering for (changed) user requirements, a decision is made to either enhance or redevelop the existing system. Figure 1 shows how the national cultural dimension scores influence the enhancement/re-development decision. The theory supporting this model is described below and relates to Propositions 1a through 8a.



**Figure 1. Influences between Cultural Dimension Scores and the Evolutionary Decision**

As noted above, culture also affects how decisions are made, and specifically at what level in the organization. Of interest from a global perspective are the cultural preferences for the level at which decisions are made, i.e., at the executive level or by issue resolution at all levels.

Figure 2. shows how national cultural dimensions influence the levels at which decisions are made. The theory supporting this model is described below and relates to Propositions 1b through 8b.



**Figure 2. Influences Between Cultural Dimension Scores and the Level at Which the Evolutionary Decision Is Made**

**Power Distance**

A culture with low APD emphasizes a flatter hierarchy and greater equality in relationships. This would tend to facilitate more vertical cooperation in the organization’s hierarchy. Employees further down the organizational hierarchy are likely to have a clearer view of the detailed requirements and how to address them. It follows that this view is more likely to be communicated and accepted by high-level management, obviating the need for unnecessary redevelopment. This argument leads to:

**Proposition 1a: Countries that have low APD scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

Decisions in a high PD environment are likely to be made at higher levels by management rather than collectively or by mutual resolution of stakeholders. Management are less likely to engage in discussions with lower levels in an effort to resolve issues (issue resolution) and will more likely take an autocratic stance in dealing with them.

**Proposition 1b: Countries that have high PD scores are more likely to make decisions at the executive level than by issue resolution.**

### ***Uncertainty Avoidance***

Hofstede points out those cultures with a high amount of uncertainty avoidance (AUA) tend to be expressive, have more formal and simple rules, and desire structure in organizations. Low UA cultures tend to desire more informal business arrangements and are more relaxed. Thus, individuals within countries with a high UA, such as Greece, would tend to favour re-development work over enhancements. Re-development work often seems to be a more simple solution, is formal, and appears more structured than the complexities that are often associated with ongoing enhancements where there is likely to be a lack of documentation and understanding of the current system.

**Proposition 2a: Countries that have high AUA scores are more likely to choose re-development than enhancement in the enhancement/re-development decision.**

Decisions in organizations that foster high levels of uncertainty avoidance (UA) are more likely to be made by mutual resolution because individuals at management level will tend to avoid situations of uncertainty (are they are making the right decision?). Thus decisions made in a more collective manner would tend to be less risky and would more likely have more certain outcomes because stakeholders are involved in the decision and thus have an obligation to see it through.

**Proposition 2b: Countries that have high AUA scores are more likely to make decisions by issue resolution than at the executive level.**

### ***Future Orientation***

Individuals with high AFO scores are more likely to be engaged in the ongoing management of the existing enterprise systems, and motivated to ensure they continue to provide for continued user requirements. They are likely to be engaged in planning and future investment, and also likely to be engaged with individuals who are close to the projects, and thus address matters by issue resolution. It is suggested that this ongoing planning orientation would facilitate enhancement rather than necessitate redevelopment

**Proposition 3a: Countries that have high AFO scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

Individuals engaged in ongoing management are likely to be in close consultation with individuals at the project level. Consequently, they are more likely to favor decisions made by issue resolution.

**Proposition 3b: Countries that have high AFO scores are more likely to make decisions by issue resolution than at the executive level.**

### ***Institutional Collectivism***

In an organizational setting, when rewards involve collective distribution of resources and collective action, improvement of an organization's IS is likely to be a collective activity. Individuals are likely to prefer a continuation of the status quo which means they would continue working in a collective manner. Enhancement would mean that they could continue working collectively, with out the disruption that a re-development would entail, thus.

**Proposition 4a: Countries that have high AIC scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

Given that decisions in organizations that foster high levels of AIC are more likely to be made collectively. Thus decisions are more likely to be made at by issue resolution rather than at executive level, which is in keeping with collective activity.

**Proposition 4b: Countries that have high AIC scores are more likely to make decisions at the executive level than by issue resolution.**

### ***Family Collectivism***

Because this construct relates to family values, it is not considered appropriate when considering organizational leadership and decision making. No propositions will be tested.

### ***Humane Orientation***

Organizations that reward individuals for being fair, altruistic, friendly, generous, caring, and kind would prefer projects that would provide them with personal freedom, individual reward, and diversity of opinion. Large-scale projects (associated with re-development, rather than a greater number of smaller projects associated with enhancement) are unlikely to do this because they are generally more structured, more tightly controlled, involve greater numbers of people, are more bureaucratic, and less flexible. In contrast, smaller projects allow individual project managers more flexibility because they are less likely to be highly structured and tightly controlled. Smaller projects are more likely to provide individuals with the opportunity to express fairness, altruistic notions, friendliness, generosity, caring, and kindness towards others. Cultures exhibiting high levels of AHO are likely to choose enhancement rather than re-development and are likely to choose issue resolution rather than executive level decision making.

**Proposition 5a: Countries that have high AHO scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

**Proposition 5b: Countries that have high AHO scores are more likely to make decisions at the issue resolution level than at executive level.**

### ***Performance Orientation***

In organizations that reward group members for performance improvement and excellence, it follows that individuals with high APO scores would prefer projects that allow them to perform well on an individual basis. Large-scale projects are unlikely to do this because they are generally more structured, more tightly controlled, involve greater numbers of people, are more bureaucratic, and less flexible. In contrast, smaller projects allow individual project managers more flexibility because they are less likely to be highly structured and tightly controlled. A smaller project is more likely to be viewed as a contribution of an individual rather than a group or committee.

For these reasons, in countries that foster APO, organizations would be more likely to have smaller projects. It is also likely that individuals with high levels of institutional collectivism perform at higher levels than those who do not, and deliver projects with more functionality for the same cost. This supports the notion that in countries that foster high levels of APO, organizations would be more likely to choose ongoing enhancement projects rather than redevelopment projects.

**Proposition 6a: Countries that have high APO scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

**Proposition 6b: Countries that have high APO scores are more likely to make decisions at the issue resolution level than at executive level.**

### ***Gender Egalitarianism***

Organizations that minimize gender role differences are likely to be more tolerant and act in a more cooperative manner. This would favor decisions involving re-development rather than the individualistic approach of enhancement where individual flair and assertiveness are rewarded.

**Proposition 7a: Countries that have high AGE scores are more likely to choose re-development than enhancement in the enhancement/re-development decision.**

In organizations that minimize gender role differences, it is likely they are more tolerant of female managers, and thus would be accepting of decisions made at executive level. This would be especially so where executive managers include females.

**Proposition 7b: Countries that have high AGE scores are more likely to make decisions at the executive level than at issue resolution level.**

**Assertiveness**

In organizations where assertiveness, confrontational, and aggressive behavior is condoned, a cooperative approach, as is required with enhancement, is less likely to be supported. Organisations in such countries are more likely to choose enhancement since re-development requires a more collective, compromise-oriented approach.

**Proposition 8a: Countries that have high AAS scores are more likely to choose enhancement than re-development in the enhancement/re-development decision.**

It is likely that individuals exhibiting assertive, confrontational and aggressive behavior will rise to management positions. Such individuals are likely to continue to behave in a similar manner forcing the decisions to be made at higher levels of management rather than collectively or by mutual resolution of stakeholders. Management are less likely to engage in discussions with lower levels in an effort to resolve issues (issue resolution) and will more likely take an autocratic stance in dealing with them.

**Proposition 8b: Countries that have high AAS scores are more likely to make decisions at the executive level than by issue resolution.**

**Research Method**

To empirically test the relationship between national culture and decision attributes, a publicly available database of project data collected by the ISBSG (International Software Benchmarking Standards Group, (ISBSG, 2001)) was used because it contains data for projects across the world, refer to Table 1. Projects were linked to the Globe cultural dimensions by appending the cultural dimension scores to the project data by country of origin of each project. Unfortunately, not all countries in the project data base have cultural scores available from the Globe project and these were dropped from the analysis (several clusters are still yet to report).

**Table 2. Countries from Which Projects Were Drawn**

Country	A5	Total	Country	A5	Total
Not Stated		371	Japan		19
Australia		221	Netherlands		65
Austria		1	New Zealand		2
Brazil		33	Norway		4
Canada		99	Other		10
Denmark		1	Sweden		1
France		61	Switzerland		1
Germany		5	United Kingdom		87
Hong Kong		3	United States		238
India		14	Uruguay		1
Italy		1			
Grand Total					1238

The ISBSG collected data from participants who worked in a variety of organizations and countries throughout the world. The participants submitted data voluntarily using a uniform questionnaire. The data set has been used and validated in other studies (Jeffery, et al., 2000; Lokan, 2000). The questionnaire solicits data on the following aspects of participants’ projects; project attributes, effort, size in function points, quality, cost and estimation. The current study focuses on project attributes. Because

of the explicit focus on maintenance and decision making, the parts of the questionnaire that are significant to the current study are :

- *Development Type* under the *Project Attributes* section where participants were asked to select one of the following: New Development, Enhancement, Re-development, Package Implementation, or Other. Projects relating to enhancements and re-developments were retained for the analysis of the enhancement/re-development decision and recoded appropriately.
- *Decision Making Process* under *People And Management Factors* section in which participants were asked to specify the decision making process in place for the project from the following: Executive sponsor identified, Steering committee in place, Issues resolution system, or Other. Projects relating to Executive Sponsor and Issues resolution were retained for the analysis of the decision making level and recoded appropriately.

**Variables**

Two models were derived from the propositions above:

$$\begin{aligned} \text{DEDEV\_EN} &= \alpha + \beta\text{APD} + \beta\text{AUA} + \beta\text{AFO} + \beta\text{AIC} + \beta\text{AHO} + \beta\text{APO} + \beta\text{AGE} + \beta\text{AAS} + \epsilon && \text{Model}_1 \\ \text{Decision level} &= \alpha + \beta\text{APD} + \beta\text{AUA} + \beta\text{AFO} + \beta\text{AIC} + \beta\text{AHO} + \beta\text{APO} + \beta\text{AGE} + \beta\text{AAS} + \epsilon && \text{Model}_2 \end{aligned}$$

Table 3 shows the Pearson Correlation Coefficients for Variables in the Study. The table indicates high correlations between some of the independent variables raising the possibility of multicollinearity. For this reason, stepwise regression was used so that only variables that contribute further significance to the model were allowed to enter the equation.

**Table 3. Pearson Correlation Coefficients for “As Is” Variables in the Study**

	REDEV_EN	Decision level	AAS	AFC	AFO	AGE	AHO	AIC	APD	APO
REDEV_EN	1.000									
Decision level	0.189	1.000								
AAS	-0.127*	-0.340**	1.000							
AFC	0.165**	0.075	0.913	1.000						
AFO	-0.194**	0.007	0.936**	0.869**	1.000					
AGE	0.173**	-0.103	0.932**	0.904**	0.948**	1.000				
AHO	-0.116*	0.001	0.924**	0.915**	0.942**	0.907**	1.000			
AIC	-0.090	0.281**	0.933**	0.911**	0.975**	0.955**	0.954**	1.000		
APD	0.177**	0.039	0.928**	0.969**	0.880**	0.947**	0.887**	0.920**	1.000	
APO	-0.045	-0.140	0.978**	0.949**	0.959**	0.949**	0.973**	0.967**	0.941**	1.000
AUA	0.047	-0.065	0.927**	0.875**	0.960**	0.985**	0.895**	0.958**	0.920**	0.942**

\*\* Significant p< 0.01 (2-tailed).

\*Significant p< 0.05 (2-tailed).

The collinearity diagnostic output from SPSS was examined because some of the correlation coefficients between the independent variables in Table 3 are relatively high, raising the possibility of a multicollinearity problem. Redev\_en had a condition index of 25.070 and Decision level a condition index of 15.671, both below the criteria value of 30 as recommended by Tabachnick and Fidell (1996).

**Results and Discussion**

Table 4 shows the results for the stepwise regressions for both Model 1 and Model 2.

**Table 4. Results of Stepwise Regressions**

	Mean Square	F Value	t	Sig.	Unstandardized Coefficients	Tolerance	VIF	R Square
<b>Model 1</b>								
Dependent Variable:	2.156	18.915		0.000				0.113
<b>REDEV_EN</b>								
(Intercept)			6.259	0.000	1.855			
<b>AFO</b>			-5.268	0.000	-0.296	0.840	1.190	
<b>AGE</b>			5.016	0.000	0.435	0.840	1.190	
<b>AAS</b>		Excluded						
<b>AHO</b>		Excluded						
<b>AIC</b>		Excluded						
<b>APD</b>		Excluded						
<b>APO</b>		Excluded						
<b>AUA</b>		Excluded						
<b>Model 2</b>								
Dependent Variable:	5.047	68.602		0.000				0.593
<b>Decision Level</b>								
(Intercept)			8.588	0.000	1.336			
<b>AAS</b>			-10.909	0.000	-0.495	0.544	1.838	
<b>AIC</b>			10.513	0.000	0.469	0.544	1.838	
<b>AFO</b>		Excluded						
<b>AGE</b>		Excluded						
<b>AHO</b>		Excluded						
<b>APD</b>		Excluded						
<b>APO</b>		Excluded						
<b>AUA</b>		Excluded						

The results of the Model\_1 regression revealed that although AAS, AHO, AIC, APD, APO and AUA have significant correlations with REDEV\_EN, AFO and AGE accounted for the majority of the variance in REDEV\_EN. AAS, AHO, AIC, APD, APO and AUA added no further explanatory power to the equation once AFO and AGE were entered into the equation. Although Globe identifies AAS, AHO, AIC, APD, APO and AUA as independent dimensions, the majority of cultural influence in the enhancement / re-development decision is captured by AFO and AGE.

An explanation for the lack of contribution by other dependent variables is that individuals working in the same organization would likely have similar values for these dimensions. The significant cross-loadings on more than one factor, noted by Dorfman, et al. (1986) in Fernandez, et al. (1997), might also contribute towards an explanation. To this end, a factor analysis of the independent variables was performed, revealing only one factor, AAS, having a communality of 0.941. No other independent variables had eigenvalues greater than 1. This finding adds further weight to the notion that a homogeneous mix of personnel in information systems development exists across all the countries/organizations from which the data has been drawn.

The management implication of this finding is there is a tendency for national cultural dimensions to influence the enhancement/re-development decision. Because of their high degree of correlation, knowledge of any of the cultural dimension scores can help management control for cultural influence, and conversely management decisions need to be tempered by knowledge of specific cultural influences.

The results of the Model\_2 regression show that two of the eight cultural elements together make a significant contribution to the variance in Decision Level. These are AAS and AIC. This suggests that national cultural dimensions have a much broader and stronger influence over management decision making at the organizational level than at the IS project level (given the strength of the association at the organizational level ( $R^2 = 0.593$ ) is much stronger than at the IS project level ( $R^2 = 0.113$ )).

The implications of these findings are that a relatively uniform global sub-culture exists across the IS project level and that national cultural dimensions play a more important role in determining the organizational level at which decisions are made. Precisely how these results affect executives, managers, researchers and others is the subject of further investigation.

Table 5 details the results of the empirical testing by proposition. Given the high correlations between the independent variables, and the results of the stepwise regression, the results are better interpreted by considering the dimensions in combination as discussed above.

**Table 5. Summary of Propositions Supported**

	<b>Proposition</b>	<b>Support</b>
P3a	Countries that have high AFO scores are more likely to choose enhancement than re-development in the enhancement / re-development decision.	Yes, p.<.01 Accounted for 3.5% variance
P7a	Countries that have high AGE scores are more likely to choose re-development than enhancement in the enhancement / re-development decision.	Yes, p.<.01. in combination with AFO, Accounted for 10.7% variance
P8b:	Countries that have high AAS scores are more likely to make decisions at the executive level than by issue resolution.	Yes, p.<.01 Accounted for 10.6% variance
P4b	Countries that have high AIC scores are more likely to make decisions at the executive level than by issue resolution.	Yes, p.<.01. in combination with AAS, Accounted for 58.5% variance

## Conclusions

We found contemporary views of national cultural dimensions are based largely on Hofstede (1980) work. They provide a basis for investigation into aspects of national culture, specifically with regard to decision making processes concerning a system's enhancement or re-development, and leadership styles across countries/clusters.

The major finding of this study is that there are significant associations between national culture and aspects of information systems management, specifically with respect to the evolutionary/ redevelopment decision, and the level at which such decisions are taken. Referring to Table 5, it can be seen that future orientation and gender egalitarianism have opposite effects on the enhancement/redevelopment decision. That is, future orientation favors enhancement whereas gender egalitarianism favors redevelopment.

From a leadership style viewpoint, knowledge of cultural dimension scores can provide management with insights into whether decisions are likely to be made at executive level or by issue resolution. It is difficult to predict the organizational level at which decisions are made based on project attributes alone, however, attributes of national culture provide an important insight into this process. The results have revealed institutional collectivism and assertiveness have a strong positive effect on decision making at the executive level, particularly when viewed in combination.

The theoretical contribution of this paper stems from combining the existing knowledge base relating to national cultural dimensions and organizational behavior to provide testable propositions. These propositions were tested empirically using the ISBSG information systems project database. The testing and statistical analysis resulted in significant associations, confirming the usefulness of national cultural dimensions in understanding and explaining the management processes relating to decision making and leadership styles.

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