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A CULTURAL VALUES INTERPRETATION FOR SOCIETAL INFORMATION DISSEMINATION CAPACITY: AN EXPLORATORY STUDY(*)

Key Words

National Culture; Cultural Dimensions; Societal Information Dissemination Capacity; the GLOBE Project; Information Technology.

Abstract

This research adopts the national cultural taxonomy of House et al. (2004) and information age statistics from the International Development Indicators of the World Bank(2004) to explore the relationship of national culture values to societal Information Dissemination Capacity (IDC). Hypotheses depicting relationships of power distance, uncertainty avoidance, future orientation, institutional collectivism, in-group collectivism, humane orientation, performance orientation, gender egalitarianism, and assertiveness to societal IDC were formulated and tested. Societies with high information dissemination capacities were found to have a pattern of low uncertainty avoidance values, low future orientation values, low institutional collectivism values, and high gender egalitarianism values. The findings of this research provide a proper foundation for further exploration of the possible influence of national culture values and practices on IDC as well the formulation of culturally-oriented policies and strategies aiming at expanding societal information dissemination capacities.

Introduction

Information dissemination capacity (IDC), i.e. the extent to which information is accessible to people and institutions in a society via communication channels and media, is indispensable for contemporary information-based economies. Enabled by information technology (IT) systems and tools, the IDC of a society should allow for rapid exchange of economic-

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ally valuable information between businesses and industries, creation of competitive advantages, and contribution to economic growth (Gurmukh *et al.*, 2000; Dewan and Kraemer, 2000).

Societies, however, vary significantly in their IDC. This variation may be attributed to differences in national cultures, among others. Cultures are complex entities that consist of interacting forces of ecology, institutions, groups, and individuals (Gelfand *et al.*, 2004). As such, societies may differ in their cultural values and practices along multiple, complex cultural dimensions (Hofstede, 1983; House *et al.*, 2004).

The literature on information systems (IS) views national culture as an essential factor that may influence global information management and IT adoption (e.g., Srite and Karahanna, 2006; Bagchi *et al.*, 2004; Straub *et al.*, 2001; Palvia, 1998; Harvey, 1997; Straub, 1994; Ein-Dor *et al.*, 1993). As such, a significant portion of global IS research has investigated the relationship of culture to IT adoption (e.g., Corbitt *et al.*, 2004; Myers and Tan, 2002; Harris and Davison, 1999; Shore and Venkatachalam, 1995; Tractinsky and Jarvenpaa, 1995; Tan *et al.*, 1995; Ives and Jarvenpaa, 1991). The relevant IS research has revealed that culture plays a significant role in innovation diffusion, technology transfer, and technology acceptance (Davison and Martinsons, 2002; Straub *et al.*, 1997; Shane *et al.*, 1995; Ein-Dor *et al.*, 1993).

The relevant prior research, however, has two limitations. Firstly, it has narrowly focused on the cultural impact on the adoption and/or use of certain types of IT applications in very few organizations or countries (Bagchi *et al.*, 2004; Martinsons and Davison, 2003), with almost no attempt made to investigate the possible cultural impact on information dissemination at the macro level in a relatively large number of countries. Secondly, it has mainly adopted Hofested's national culture taxonomy, whose reliability and relationship to nations' economic performance have been debatable (Yeh and Lawrence, 1995). Nevertheless, House *et al.* (2004) proposed a national culture taxonomy that operationalizes and extends national culture into nine dimensions with two distinct facets of value and practice for each. This national culture taxonomy circumvents most of the criticisms to Hofstede's work (e.g. Myers and Tan, 2002).

This research adopts the national cultural taxonomy of House *et al.* (2004) and the International Development Indicators of the information age (The World Bank, 2004) in order

to explore the impact that national culture values may have on IDC at the societal level. It puts forward culturally-based implications for policies and strategies pertinent to IDC, as a critical factor for social and economic development.

The remainder of this paper is organized accordingly. The research background is described next, followed by research model and hypotheses, research methodology, research results, discussion of the research results, research limitations and future research, and the paper ends with conclusions and implications.

Background

National culture:

National culture is a collective programming of the mind that discerns the members of one group of people from another (Hofstede, 1991, p: 5), and shapes values, beliefs, assumptions, expectations, perceptions and behaviors. Culture is also viewed as a set of beliefs and shared values (Javidan and House, 2001). Cultural values are people's aspirations about the way things should be done. These basic values and beliefs are acquired early in life through socialization and education, and make people of a society share certain beliefs and assumptions and prefer certain matters and issues (Hofstede, 1980, p. 25).

Hofstede's (1980) and House's et. al (2004) national cultural taxonomies are the most recognized taxonomies among researchers. Although Hofstede's (1980) pioneer work on national culture is evident, it has been subjected to criticism. Researchers are embroiled in a debate over the reliability of his national culture work and its relationship to nations' economic performance (Yeh and Lawrence, 1995). In addition, Hofstede's data covers only three regions of the world, his country classification was reported more than twenty-five years ago, and some societal cultures may have changed since then (Carlson *et al.*, 1997).

More recently, House and his colleagues carried out a 10-year research program, the Global Leadership and Organizational Behavior Effectiveness Research Program (GLOBE), to examine culture in terms of practices and values. Practices are acts or the way things are done in the culture. Values are the way things should be done (House, 2004). Data was collected between 1994 and 1997 from sixty-two societies in order to measure cultural practices and values existed at the levels of industry, organization, and country. The GLOBE data yielded reliable and valid estimates of cultural-level constructs (Javidan *et al.*, 2004).

The following are the nine cultural dimensions of the GLOBE (House *et al.*, 2004: 30):

1 - Power distance: The extent to which the members of a society expect power to be distributed equally.

2 - Uncertainty avoidance: The extent to which individuals in a society, rely on social norms, rules, and procedures to alleviate unpredictability of future events.

3 - Future orientation: The extent to which individuals engage in future-oriented behaviors such as delaying gratification, planning and investing in the future.

4 - Institutional collectivism: The degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action.

5 - In-group collectivism: The extent to which individuals express pride, loyalty, and cohesiveness in their organizations or families.

6 - Humane orientation: The degree to which a collective encourages and rewards individuals for being fair, altruistic, generous, caring, and kind to others.

7 - Performance orientation: The extent to which a collective encourages and rewards group members for performance improvement and excellence.

8 - Gender egalitarianism: The extent to which a collective minimizes gender inequality.

9 - Assertiveness: The degree to which individuals are assertive, confrontational, and aggressive in their relationships with others.

Two sets of scores were identified for each of the nine cultural dimensions: one set represents the cultural values, and the other set represents the cultural practices in the investigated countries. The main focus of this study is on the relationship between cultural values and IDC, leaving the relationship of cultural practices to IDC to a future investigation.

National culture and information dissemination:

IS literature signifies the influence of cultural differences on IT deployment, implementation, and use (Shore and Venkatachalam, 1995; Tractinsky and Jarvenpaa, 1995; Ives and Jarvenpaa, 1991) as well as on the deployment and management of global information systems (Myers and Tan, 2002; Harris and Davison, 1999; Tan *et al.*, 1995). Subsequently, national culture is perceived to be a strong factor that explains differences in IT adoption across organizations and countries (Bagchi *et al.*, 2004; Martinsons and Davison, 2003; Palvia, 1998; Harvey, 1997; Ein-Dor *et al.*, 1993).

Ein-Dor and Segev (1992) assert that national culture has an effect on information systems use. Tan *et al.* (1998) found that the influence of computer-mediated communication (CMC) was contingent on national culture. Hasan and Ditsa (1999) reported culture as a significant factor that explained differences in IT adoption in West Africa, the Middle East and Australia. Pook and Fustos (1999) found national culture to influence work environment, dissemination and availability of information, willingness to search for information, and managers' willingness to share information with employees.

More recently, Straub *et al.* (2001) found Arab cultural beliefs to be a strong predictor of resistance to IT adoption. Bagchi *et al.* (2004) conducted a study in thirty-one nations and found that the national cultural dimensions of Hofstede (2001) could be used to predict most of IT products (e.g., PC, telephone, cellular phone, fax, the Internet, and pager) adoption in the investigated countries. Heals *et al.* (2004) adopted the national culture taxonomy of House *et al* (2004) and found that national culture dimensions significantly associated with the outcome of system enhancement and re-development decisions, and the organizational level at which such decisions are made. They also found that system enhancement was preferred in a future orientation culture, whereas system re-development was preferred in a gender egalitarian culture. In addition, Zhan *et al.* (2007) found empirical evidence to link nearly all of Hofstede's culture dimensions to nations' internet penetration either as main effects or as interactions with countries' educational levels.

However, this information systems and information technology (IS/IT) prior research has narrowly focused on the cultural impact on the adoption and/or use of certain types of IT applications in small numbers of organizations or countries (Martinsons and Davison, 2003; Bagchi *et al.*, 2004). With the exception of the investigation of Bagchi *et al.* (2004), no attempts, that the authors are aware of, were made to investigate the possible cultural impact on IDC at the macro level in a relatively large number of countries.

Furthermore, the predominant portion of the IS/IT prior research that investigated national cultural aspects of IT adoption relied on Hofstede's (1980, 1991) taxonomy of national culture (e.g., Keil *et al.*, 2000; Tan *et al.*, 1995; Straub, 1994; Watson *et al.*, 1994). Myers and Tan (2002) cited thirty-six studies that examined national culture and IS issues, of which twenty-four adopted varying numbers of Hofstede's dimensions.

However, the reliability and relationship of such dimensions to nations' economic performance are controversial (Yeh and Lawrence, 1995).

Nevertheless, House *et al.* (2004) taxonomy circumvents most of the criticisms to Hofstede's work, particularly those linking culture to a nation state (e.g. Heals *et al.*, 2004; Myers and Tan, 2002). Therefore, this investigation adopts the national culture taxonomy of House *et al.* (2004) to explore and interpret the differences that may exist among countries in their capacity to disseminate information.

Research model and Hypotheses

Research Model:

Countries differ substantially based on their cultures (House *et al*, 2004; Ralston *et al.*, 1992). Decision makers in organizations and countries are expected to echo their cultural values when making decisions such as the adoption of communication media and channels that facilitate information dissemination at the societal level.

Figure 1 depicts the research model used in this study, including the research variables and the hypothesized relationships. This research design explores the possible influence of the nine national cultural dimensions of House *et al.* (2004) on the societal IDC. The model is drawn based on the findings of the relevant prior research that investigated cultural impacts on IS/IT adoption and use.

Research Hypotheses:

1. Power distance and IDC

Power distance reflects the degree to which a community maintains inequality among its members by stratification on individuals and groups with respect to power, authority, prestige, status, wealth, and material possessions (House *et al.*, 2004; Hofstede, 1980, 1991). Higher power distance societies tend to be differentiated into classes. In such societies, power provides social order, relational harmony, and role stability. Information is controlled, few people have access to resources, and different groups have different involvement levels (Carl *et al.*, 2004).

In societies with high power distance culture, people are reluctant to accept empowering initiatives with respect to both physical and information-based activities. IT adoption could be perceived as a threat to the hierarchy, which reflects inequality among people at the different levels of the hierarchy. These societies are more likely to maintain the status quo and resist IT adoption, which consequently, limit the tools and means

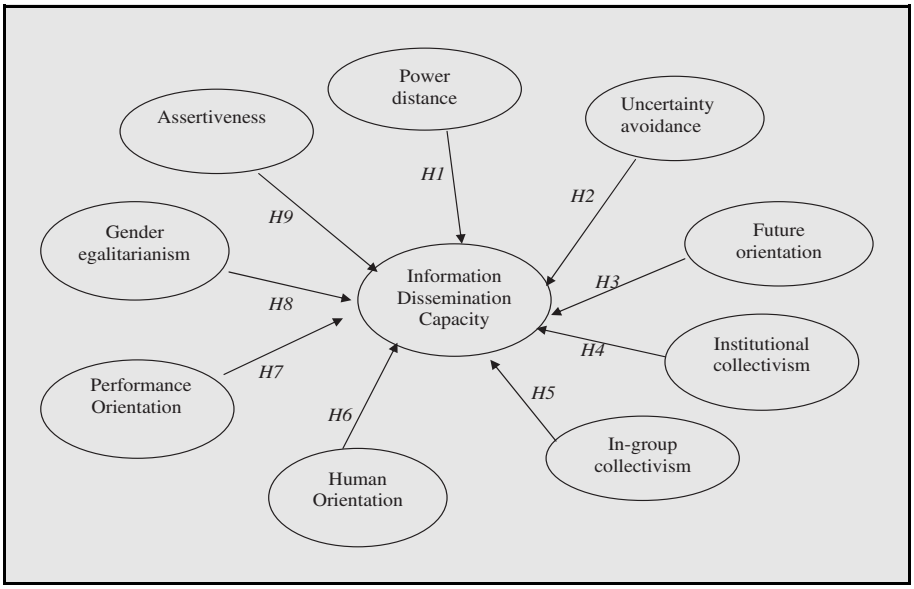

Figure 1: Research Model

available for people and organizations to access information.

On the other hand, in societies of low power distance culture, perception is likely to influence the antecedents of IT adoption (Compeau and Higgins, 1995 Bandura, 1986), and individuals are likely to be more favorable to IT, since it does not contradict their perception of power distribution. In their investigation of the role of espoused national cultural values in IT acceptance, Srite and Karahanna (2006) found espoused low power distance values to moderate the relationship between subjective norms and intention to use personal computers (PCs).

Shane (1992) found low power distance culture to be more inventive than high power distance culture. In addition, Hasan and Ditsa (1999) argue that IT has been originated and nurtured in a low power distance culture where a balance of power exists between management and workers. With the penetration of IT in a society, traditional distribution of hierarchical power tends to disappear, teams and network structures emerge, and the need for information increases.

Compared to high power distance culture, low power distance culture is expected to be more supportive of the adoption of tools and means that extend a society's IDC. This expectation is formulated in the following hypothesis:

H1: IDC is greater in nations with lower power distance values.

2. Uncertainty avoidance and IDC

Societies that are high in uncertainty avoidance have a tendency toward formalizing their interaction with others, documenting agreements in legal contracts, relying on formalized policies and procedures, establishing and following rules, verifying communication in writing, and showing stronger desire to establish rules allowing predictability of behaviors (de Luque and Javidan, 2004). Uncertainty avoidance reflects the attempts of people to avoid vague situations by providing norms, values, and beliefs in a form of rules, laws and regulations. Deviant people and ideas should not be tolerated; experts and authorities are usually correct in such a culture (Davis and Ruhe, 2003). In addition, members of these societies tend to socialize and collaborate in order to defeat a less predictable future (Armstrong, 1996).

Uncertainty avoidance has been the focus of IS/IT adoption and use (Francis, 1997). Telecommunication products such as e-mail, telephones, fax machines, and cellular phones can reduce uncertainties in communication (Bagchi *et al.*, 2003). In addition, individual feedback-seeking behavior with formal sources is beneficial to reducing these uncertainties. Srite and Karahanna (2006) found espoused high uncertainty avoidance values to moderate the relationship between subjective norms and intention to use personal computers and personal digital assistants (PDAs). Straub (1994) found telephone use to be the same in the U.S. and Japan, but fax and e-mail use to vary distinctly, with Japan to be a heavy user of fax and the U.S. to be a heavy user of e-mail. He attributed these differences, among other things, to Hofstede's cultural dimension of uncertainty avoidance. Bagchi *et al.* (2004), however, found uncertainty avoidance to be the cultural dimension whose relationship to IT adoption was the least evident in their investigation of thirty-one countries.

On the other hand, people in societies with low uncertainty-avoidance culture tend to take more risks and are more tolerant of deviant behavior and innovative ideas (Hofstede, 1980). IT tends to flourish in low uncertainty avoidance cultures (Hasan and Ditsa, 1999), where decision makers can take risks in adopting IT. Although IT adoption is considered inherently risky, this risk is unavoidable in the global economy, and the risk is even greater with no IT solutions (Hasan and Ditsa, 1999). Danowitz *et al.* (1995) found that the high uncertainty avoidance culture in the Middle Eastern countries to be a significant factor of low IT adoption in such countries.

It is proposed on balance that societies with high uncertainty avoid-

ance are expected to develop and maintain a sophisticated communication infrastructure that is capable of supporting the growing need for information through risk-avoiding behaviors. This prediction is formulated in the following hypothesis:

H2: IDC is greater in nations with higher uncertainty avoidance values.

3. Future orientation and IDC

Cultural future orientation is the degree to which a society encourages and rewards future oriented behaviors such as planning and gratification (Javidan and House, 2001). Societies with high future orientation culture achieve economic success, have organizations with a longer strategic orientation, have flexible and adoptive organizations and managers, place a higher priority on long term success, have a strong capability and willingness to imagine future contingencies, formulate future goals, and seek to achieve goals and develop strategies for meeting their future aspirations (Ashkanasy *et al.*, 2004).

Cultures with low future orientation, on the other hand, show spontaneity and the capability to enjoy the moment. They are free from the past worries or future anxieties. They may show incapability or unwillingness to plan a sequence to realize their desired goals and may not appreciate the warning signals that their current behavior negatively influences realization of their goals in the future (Ashkanasy *et al.*, 2004).

Societies with high future orientation are expected to have high demand for information in order to support their social and economic development programs. They are likely to make decisions and allocate sufficient resources in order to enhance and strengthen their IT capabilities (Heals *et al.*, 2004).They are expected to plan, invest, and develop an information and communication infrastructure in order to support the planned social and economic transformational processes. This expectation is formulated in the following hypothesis:

H3: IDC is greater in nations with higher future orientation values.

4. Institutional collectivism and IDC

In societies with institutional collectivism culture, people are integrated into strong cohesive groups, group goals take precedence over individual goals, people emphasize relatedness with group, and individuals are likely to engage in group activities and make greater distinctions between in-groups and out-groups (Gelfand *et al.*, 2004). Efforts are made to maintain unity and avoid disagreement among group members (Watson *et al.*, 1994), and people prefer working

together in collective styles, where cooperation and synergistic effects are more prominent than people's desires (House *et al.*, 2001; Watson *et al.*, 1994; Hofstede and Bond, 1988).

IS/IT development, implementation, and use require the cooperation of many people and team members. Compared to individualistic cultures, institutional collective cultures tend to provide environments that are conducive to the adoption of tools and means that facilitate group's interactions and sharing of information deemed necessary for team-working. In their study of IT adoption in Middle Eastern countries, Hasan and Ditsa (1999) concluded that collective culture was a contributing factor to two successful IT projects where concern for the common good overcame lack of resources and expertise. Chung and Adams (1997) found that countries with more collectivist tendencies (e.g., China, Korea) might actually adopt collectivist software such as enterprise resources planning (ERP) systems more effectively than countries with individualistic cultures (e.g., US, Australia). In addition, Haythornthwaite and Wellman (1998) found e-mail communications to increase as a supplement to face-to-face communications in collectivist countries.

An institutional collectivism culture tends to encourage and reward group interaction and collaboration, which require significant information and knowledge sharing. Therefore, institutions and individuals in societies with higher institutional collectivism cultures are predicted to commit more resources in order to adopt tools and means that expand their information exchange capacity. This prediction is formulated in the following hypothesis:

H4: IDC is greater in nations with higher institutional collectivism values.

5. In-group collectivism and IDC

In-group collectivism is a culture where emphasis is on family, and involves pride and loyalty for the organization (House *et al.*, 2004, p. xvii). Societies with in-group collectivism culture tend to have tightly coupled social networks, as the long lasting patterns of inter-relationships and interdependence are recognized and a strong sense of group identity is present (Bagchi *et al.*, 2004).

Given that people in collectivist societies tend to be linked to fewer, stronger, and longer lasting groups, IT tools can be used to promote continuing contact between the members of the different groups (Bagchi *et al.*, 2004). Group-oriented systems such as group support systems (GSS) would be more appropriate systems for such collectivistic societies (Hasan and Ditsa, 1999). How-

ever, it can be argued that the opportunity for face-to-face interactions is greater in collectivistic societies, and the necessity for telecommunications resources for maintaining the relationships tend to be lower.

In societies with low in-group collectivism, however, ties between individuals are loose and people are expected to look after themselves or intermediate family (Hofstede, 1980). In addition, individual goals take precedence over group goals, people emphasize rationality, individuals are likely to engage in activities alone, and individuals make fewer distinctions between in-group and out-groups (Gelfand *et al.*, 2004). In such societies, people are expected to be more inclined to adopt IT applications developed in Western societies and tend to have more devices such as PCs and phones at home than do their counterparts in less individualistic societies (Bagchi *et al.*, 2004).

People in individualistic societies are expected to be more economically prosperous, enjoy higher purchasing power, and are more likely to adopt IT tools and applications (Bagchi *et al.*, 2004), and therefore, are likely to have more means for information exchange. This expectation is formulated in the following hypothesis:

H5: IDC is greater in nations with lower in-group collectivism values.

6. Humane orientation and IDC

Humane orientation culture refers to the degree to which a society encourages and rewards an individual for being fair, altruistic, friendly, generous, caring, and kind to others (House *et al.*, 2002). Societies with high humane orientation are likely to have projects that allow people to be tolerant of mistakes (Heals *et al.*, 2004), friendly, sensitive, and value harmony (Javidan and House, 2001). Low humane orientation culture, on the other hand, involves self-interest promotion and lack of human consideration.

Societies with severe climate and physical conditions have higher humane orientation culture (Kabasakal and Bodur, 2004). In such societies, people care for others, and in dire need for information and knowledge to survive and grow in such bleak circumstances. This viewpoint suggests that humane oriented societies will be more inclined to adopt tools and means for governments to provide the needed informational support, and for people to have access to such information.

In low humane oriented societies, it is difficult to successfully adopt participative management in organizations, which is considered an important factor contributing to IS/IT adoption and use (e.g., Seliem *et al.*, 2003; Torkzadeh, and Doll, 1994; Gyampah and White, 1993).

However, low humane orientation is observed in societies that are economically developed, modern, and urbanized (Kabasakal and Bodur, 2004).

It is proposed on balance that less humane oriented societies will have more IDC. This proposition is formulated in the following hypothesis:

H6: IDC is greater in nations with lower humane orientation values.

7. Performance orientation and IDC

Performance orientation reflects the extent to which a society encourages and rewards innovation, high standard, and performance improvement (Javidan, 2004). Performance orientation is related to issues of both external adaptation and internal integration in terms of the practices and values that have an impact on the way a society defines success in adapting to external challenges and the way the society manages interrelationships among its people (Javidan, 2004).

A key element of performance orientation as a cultural dimension is the nature of the individual's relationship with the outside world. High performance oriented societies tend to value those individuals and groups that produce results and accomplish their assignments (Javidan, 2004). Societies that score high on performance orientation tend to believe that schooling and education are critical for success, value training and development, emphasize results more than people, value competitiveness, value taking initiative, believe that any one can succeed if s/he tries hard enough, value what you do more than what you are, and have a monochromic approach to time (Javidan, 2004).

Societies with high performance orientation practices are economically more successful and globally more competitive. People enjoy more positive attitudes towards life, prefer a strong role for private ownership of business, and prefer individual accountability for their own well-being (Javidan, 2004). In addition, people who are better educated and more technologically competent will value time and adopt the tools and means that help them to be more efficient.

Therefore, it is predicted that higher performance orientation societies are expected to have higher IDC. This expectation is formalized in the following hypothesis:

H7: IDC is greater in nations with higher performance orientation values.

8. Gender egalitarianism and information dissemination

Gender egalitarian societies seek to minimize differences between the roles of females and males in homes, organizations, and communities (Emrich *et al.*, 2004). Some societies are

more gender egalitarian and seek to minimize gender role differences, whereas other societies are more gender differentiated and seek to maximize such differences (House, 2004). Societies that score higher on gender egalitarianism tend to have more women in positions of authority, accord women a higher status in society, afford women a greater role in community decision making, have a higher percentage of women participating in the labor force, have higher female literacy rates, and have similar levels of education of females and males (Emrich *et al.*, 2004).

People in societies that minimize gender role differences are likely to be more tolerant and act in a cooperative way, which fosters information dissemination for personal use. In these societies, where women play a more significant role in social and economic developments, more information will be needed, and more tools and means for information access and exchange for personal use will be expected to be adopted (Bagchi *et al.*, 2004). Srite and Karahanna (2006) found femininity to have a significant moderating effect on the relationship between subjective norms and intention to use PCs.

On the other hand, a lower gender egalitarian (e.g., high masculinity) culture emphasizes power, assertiveness, and individual achievement (Watson *et al.*, 1994). Gefen and Straub (1997) reported that although men and women's beliefs and perceptions of computer-based media were different, their use of e-mail was not. Srite (2000) argues that the masculine emphasis on tasks suggests that people with high masculine values are more concerned with the usefulness of a given technology, regardless of whether it is easy or difficult to use. Assertiveness, performance, success, and competition are likely to increase the depth and breadth of IT adoption for work purposes in low egalitarian societies (Bagchi *et al.*, 2004). Srite and Karahanna (2006) found a significant moderating effect of espoused masculinity values on the relationship between perceived ease of use and intention to use PDAs.

On balance, and following Bagchi's *et al.* (2004) recommendation, it is postulated that higher gender egalitarian societies are likely to have more IDC. This proposition is formulated in the following hypothesis:

H8: IDC is greater in nations with higher gender egalitarianism values.

9. Assertiveness and IDC.

Assertiveness originates in the masculinity-femininity cultural dimension of Hofstede (1980). It refers to the degree to which individuals in a society are assertive, tough, dominant, and

aggressive in social relationships. It is an important dimension of a nation's culture that relates to the issues of external adaptation and internal integration (den Hartog, 2004: 403).

Assertiveness is also viewed as an internally consistent set of practices and values regarding the way in which people are seen to, and ought to, behave in social relationships in a community. As a cultural dimension, assertiveness is related to the nature of the relationship of individuals, groups, and societies with the outside world (den Hartog, 2004: 404). Societies that score higher on assertiveness tend to value assertiveness, dominance, tough behavior, and try to have control over the environment (den Hartog, 2004: 405).

House *et al.* (2004) assert that societies with high assertiveness culture do well in global competitiveness, but exhibit low levels of psychological health (p. xvi). Assertiveness values were found to positively correlate with success in science and technology (House, 2004, p. 432). Societies with high assertiveness tend to be more focused on accomplishment and success, and the usefulness of IT tools and means that help them to be successful. Consequently, a culture that values assertiveness, performance, success, and competition is likely to encourage and reward the adoption and use of tools and means that facilitate information access and exchange.

Societies that are high in assertiveness are expected to commit more resources to establish and use tools and means for information production and distribution in order to support people's resolve and drive for achievement. This expectation is formulated in the following hypothesis:

H9: IDC is greater in nations with higher assertiveness values.

Research Methodology

Research Variables:

1 - The independent variables: The independent variables include the nine cultural dimensions of House *et al.* (2004)--namely, power distance, uncertainty avoidance, future orientation, institutional collectivism, in-group collectivism, humane orientation, performance orientation, gender differentiation, and assertiveness. Only cultural value scores are used in this research.

2 - The dependent variable: A surrogate measure is used to operationalize the societal IDC variable. The measure includes six of the information age indicators that are part of the World Bank's (2004) World Development Indicators.

Sample and Data Sources:

This research relies on the data published by House and colleagues (House *et al.*, 2004) that measure the nine national cultural variables in sixty-two societies (sixty-one countries). The countries included in the data set are presented in Appendix A. The data set includes culture values that were collected using a sample of 18,000 managers representing telecommunications, food, and banking industries. The sample covers all major geographic regions of the world and all different types of economic, political, and business institutional systems across the nine cultural dimensions.

Table 1 includes the minimum, maximum, mean, and standard deviation for the value scores for the nine national culture variables.

The reliability of the nine national culture scores are documented in House *et al.* (2004: xv, 725). The GLOBE researchers performed pilot tests, used double translations, and checked the psychometric characteristics of their instruments of the constructs. They also checked reliabilities and construct validity using multitrait, multimethod approaches (House, 2004), and concluded that their data set yielded reliable and valid estimates of the cultural constructs (Javidan *et al.*, 2004).

On the other hand, IDC is viewed as the extent to which information is accessible to people and institutions in a society via communication channels and media. Six indicators were drawn from the information age statistics reported by the World Bank's (2004)

Table 1
Descriptive Statistics for National culture Values*

Cultural Dimensions	N	Min	Max	Mean	Std. Dev.
Uncertainty avoidance (UA-V)	61	3.16	5.61	4.5938	.6105
Future orientation (FO-V)	61	2.95	6.20	5.4377	.5166
Institutional collectivism (INSC-V)	61	3.83	5.65	4.6997	.4907
Human orientation (HO-V)	61	3.39	6.09	5.3864	.3614
Performance orientation (PO-V)	61	2.35	6.58	5.8782	.5683
In-group collectivism (INGC-V)	61	4.06	6.52	5.6330	.4083
Power distance (PD-V)	61	2.04	4.35	2.7715	.4048
Gender egalitarian (GE-V)	61	3.18	5.17	4.5080	.4804
Assertiveness (AS-V)	61	2.66	5.56	3.8093	.6297

* Adopted from House *et al.*, 2004

World Development Indicators as surrogate measures for IDC. These indicators were selected because of (1) their relevance to the IDC construct, as being operationalized in this investigation, and (2) their homogeneity, as each indicator is presented as a figure per 1000 inhabitants. These indicators include:

1) Daily newspapers
2) Radio sets
3) TV sets
4) TV cables
5) Personal computers (PCs)
6) Internet users

Year 2004 indicators are chosen in order to minimize the time gap between the national culture data set and the World Development Indicators. Table 2 depicts the minimum, maximum, mean, and standard deviation for each of the six IDC indicators. The number of countries for each indicator varies depending on the missing values. That leaves a sample size of fifty-two countries (N = 52) for IDC. Appendix A shows the nine countries that have missing IDC-Index data.

Factor analysis was applied to the six indicators of IDC in order to remove redundancy in the data and reveal the underlying pattern that existed between the items, reduce the number of factors, and measure their reliability coefficients. The extraction method used is the principle component analysis, one or higher Eigenvalue, and Varimax rotation method.

The produced statistics suggest the appropriateness of the factor analysis. The Bartlett test of sphericity, a test for the presence of correlations among the variables, is significant (p = .00). The measure of sampling adequacy (MSA), a measure of the intercorrelations among the variables, is 0.87, which is well beyond the 0.70 threshold of adequacy (Hair *et al*., 1998: 99).

Table 2
Descriptive Statistics for IDC Indicators (per 1000 inhabitants)

IDC Indicators	N	Min	Max	Mean	Std. Dev
Daily newspapers	57	5.00	792.00	178.2456	166.24308
Radio sets	59	79.00	2811.00	650.4746	519.21636
TV sets	59	51.00	965.00	416.6949	237.27863
TV cables	55	00.00	401.40	92.5564	108.17268
PCs	57	7.10	708.70	220.6772	217.93622
Internet users	59	00.00	573.00	209.9661	189.21033
Valid N (listwise)	**52**				

Table 3
Factors Analysis Results for the Information Dissemination Capacity Measures

Factor and Items	Factor Loading	Extracted variance
IDC-Index:		75.656%
Newspapers	.796	
Radio sets	.842	
TV sets	.886	
TV Cables	.789	
PCs	.947	
Internet Users	.944	

As depicted in Table 3, the six IDC indicators are loaded on only one factor (IDC-Index), with an extracted variance of approximately 76%. The factor analysis results were captured and used to produce a singular surrogate measure of IDC, called hereinafter IDC-Index. IDC-Index was computed for each country by weighing the original scores of the six indicators with their factor loadings, and dividing the result by the factor loadings total.

Table 4 displays the IDC-Index descriptive statistics, with a mean of 312.6 and a relatively dispersed distribution (standard deviation = 217.3). The one-sample Kolmogorov-Smirnov test was used to verify the normality of the IDC-Index distribution, and the result suggests that the distribution is normal (Z = 1.86, P = .120).

The overall reliability--the internal consistency of the 6-item scale--of the IDC-Index was measured by Cronbach's alpha coefficient, which was found to be.863. This coefficient is greater than 0.60, the acceptable lower level recommended by Hair *et al.* (1998: 118) for exploratory research such as this one.

Results

Pearson correlations for the nine national culture dimensions (Table 1)

Table 4
Descriptive Statistics for the Information Dissemination Capacity Variable (IDC-Index) (N = 52)

	Min	Max	Mean	Std. Dev.
IDC-Index	312.6163	936.12	41.93	217.32480

and IDC were calculated. Table 5 depicts the significant correlations among the cultural dimensions values and IDC-Index.

The results appearing in Table 5 may suggest the existence of multicollinearity in the data set, since there are a number of significant correlations existing among the national culture dimensions values. This means the effects of some of the cultural variables (dimensions) can be predicted or accounted for by the other variables in the model (Hair *et al.*, 1998: 24).

In order to minimize the possible effect of multicollinearity and unmask any other possible relationships that the other national culture dimensions may have with IDC-Index, the scores were transformed into standardized scores. However, the recalculated correlation matrix, using the standardized scores, shows significant Pearson correlations between the national culture dimensions and IDC-Index that are similar to those reported in Table 5. The Pearson correlations using the standardized scores are depicted in Appendix B.

In addition, two common measures of multicollinearity (tolerance and variance inflation factor (VIF)) were computed, and the results showed insignificant effect of multicollinearity on the relationships between the national culture values and IDC-Index.

Table 5
Pearson Correlations for the National Culture Values and IDC-Index

Variables	FO-V	INSC-V	HO-V	PO-V	INGC-V	PD-V	GE-V	AS-V	IDC-INDEX
UA-V	.638**	.427**			.349**		-.475**		-.805**
FO-V		.495**	.378**	.691**	.656**	-.360**			-.573**
INSC-V				.432**	.353**	-.382**		-.282*	-.520**
HO-V				.604**	.265*	-.618**	.303*		
PO-V					.698**	-.610**	.296*		
INGC-V						-.423**			
PD-V							-.521**	.292**	
GE-V									.440**
AS-V									

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The correlation results of Table 4 are used to test the research hypotheses (*H1-H9*), describing the predicted relationships between the nine cultural dimensions values and IDC-Index. IDC-Index correlates positively with gender egalitarianism values ($r = .440$, $p < .05$). In addition, IDC-Index correlates negatively with uncertainty avoidance values ($r = -.805$, $p < .01$), future orientation values ($r = -.573$, $p < .01$), and institutional collectivism values ($r = -.520$, $p < .01$). ICD-Index, however, does not correlate with human orientation values, performance orientation values, in-group collectivism values, or assertiveness values. These results suggest the acceptance of only one hypothesis (*H8*), as the IDC of a nation correlates positively with a culture where people believe in equality between men and women. On the other hand, the results suggest the rejection of *H1, H2, H3, H4, H5, H6, H7, and H9*.

In addition, stepwise regression was adopted in order to explore the significance of the national culture values in explaining the variance in IDC. The analysis produced a model that includes three cultural dimensions (Table 6): uncertainty avoidance (*Beta = -.553*), institutional collectivism (*Beta = -.325*), and gender egalitarian (*Beta = .251*). The model explains approximately 71% of the IDC variance (adjusted $R^2 = .708$).

The regression model depicted in Table 6 is considered appropriate. The collinearity statistics of tolerance is greater than zero (ranges from.530 to.640), and the variance inflation factor (VIF) is less than 10.00 (ranges

Table 6
Results of the Regression Analysis of the Nine Cultural Values and IDC

Predictors	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1272.264	280.059		4.543	.000
UA-V	-189.636	35.390	-.553	-5.358	.000
INSC-V	-144.920	41.860	-.325	-3.462	.001
GE-V	126.392	47.677	.251	2.651	.011

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin-Watson
3	.851(c)	.725	.708	117.47809	1.501

Dependent Variable: IDC-Index)

from 1.563 to 1.861). These statistics indicate the insignificance of multicollinearity among the three cultural variables in the model (Hair *et al.*, 1998: 220). In addition, the Durbin-Watson value of 1.501 (at.05 significance level and N = 61) indicates the insignificance of autocorrelations in the data set.

Discussion

This investigation was designed to explore the relationship that national culture may have with IDC at the societal level. Nine hypotheses were formulated and tested to explore such relationships. Table 7 summarizes the hypotheses testing results.

Hypotheses *H1-H9* predicted directional relationships between national culture values and IDC. The results support the acceptance of only *H8* (gender egalitarianism), and the rejection of the other eight hypotheses.

However, it should be noted that the results indicate the existence of significant negative relationships between the national culture dimensions of uncertainty avoidance values, future orientation values, and institu-

Table 7
Summary of the Hypotheses Testing Results

National Culture Dimensions	Hypothesized Relationships with IDC	Detected Relationships with IDC	Acceptance/ Rejection Decision
Power distance H1	Negative	----------	Reject
Uncertainty avoidance H2	Positive	Negative	Reject
Future orientation H3	Positive	Negative	Reject
Institutional collectivism H4	Positive	Negative	Reject
In-group collectivism H5	Negative	----------	Reject
Human orientation H6	Negative	----------	Reject
Performance orientation H7	Positive	----------	Reject
Gender egalitarianism H8	Positive	Positive	Accept
Assertiveness H9	Positive	----------	Reject

tional collectivism values and IDC. Although significant, these relationships are contrary to what was predicted.

IDC tends to be greater in societies with higher gender egalitarian values. This finding supports Bagchi's *et al.* (2004) postulation that, compared to lower gender egalitarian societies, people and institutions in higher gender egalitarian societies are likely to be more adoptive of IT-based means for information production and dissemination, which, subsequently, increases a society's capacity to disseminate information.

In high gender egalitarian societies, women tend to have a greater role in community decision making, have a higher participation in the labor force, have higher literacy rates, and have similar levels of education to men (Emrich *et al.*, 2004). Such societies tend to be more perceptive to the adoption of means and tools that foster communication and information dissemination for work purposes as well as for personal use and networking. In addition, since women play a significant role in social and economic developments, more information will be needed, and more tools and means for information access are expected to be adopted and used. This finding is consistent with those reported by Heals *et al.* (2004) and Bagchi *et al.* (2004) regarding the adoption of IT applications for information production and dissemination.

However, a negative relationship was found between uncertainty avoidance values and IDC, which suggests that societies with higher uncertainty avoidance values tend to have lower IDC. This finding is consistent with Danowitz's *et al.* (1995) observation that low IT adoption associates with high uncertainty avoidance culture. It also supports the notion that people in societies with low uncertainty-avoidance culture tend to be more innovative and take more risks (Hofstede, 1980). In addition, IT adoption is considered inherently risky, but people may believe that risk would be greater without IT solutions (Hasan and Ditsa, 1999). Therefore, IT adoption tends to flourish in such societies, where people and institutions adopt computers, access the Internet, acquire TV and radio sets, and subscribe to daily newspapers in order to have access to digital and non-digital information.

Societies with higher future orientation values were predicted to have higher IDC. However, future orientation values were found to have a negative relationship with IDC. One interpretation for this finding is that societies with low future orientation

tend to enjoy the moment and be impulsive. Such societies are free from the past worries or future anxieties (Ashkanasy *et al.*, 2004). Consequently, people and institutions in these societies may acquire TV and radio sets, subscribe to newspapers, adopt PCs, and have access to the Internet not only as means for information acquisition and exchange but also as means for entertainment and enjoyment.

Also, most industrialized and higher-income countries have comparatively low scores on future orientation values (Ashkanasy *et al.*, 2004). Prosperous and higher-income societies should be able to afford investing more resources on the acquisition of tools and means that enable people and institutions to exchange and share information needed for economic development, social advancement, and entertainment. This finding suggests that people in such countries may believe that investing into the future is not as urgent as using the resources for near or immediate entertainment and enjoyment.

Institutional collectivism was also found to have a negative relationship with IDC. As such, societies with low institutional collectivism (e.g., individualistic) tend to have high information dissemination capacities. This finding is counterintuitive. A high institutional collectivism culture was expected to provide an environment that is conducive to the adoption of tools and means that facilitate group interactions, and sharing of information is crucial for collaboration, networking, and team-working.

One explanation for this finding may be made based on the negative relationship that institutional collectivism value was found to have with economic prosperity and competitiveness index and success in basic science (Gelfand *et al*, 2004). Developed countries such as the USA and Australia scored low on institutional collectivism. Yet, they are more economically prosperous, compared to many developing countries that scored high on institutional collectivism value. Therefore, higher information dissemination capacities are likely to exist in societies where individuals and institutions can easily manage to pay for media and tools such as TVs, radios, PCs, telephone lines, and Internet access.

To further assess the significance of the national culture values in explaining the variance in IDC, the stepwise regression analysis resulted in an appropriate regression model that includes three national cultural dimensions (Table 6): uncertainty avoidance, institutional collectivism, and gender egalitarian. Accordingly,

future orientation values seem to be a redundant cultural dimension in explaining the variation in IDC across societies. Nevertheless, the model demonstrates a high explanatory power, since it explains approximately 71% of the IDC variance.

Therefore, the findings of this investigation suggest that the IDC of a country can be interpreted in terms of its national culture values. The three cultural dimensions of uncertainty avoidance, institutional collectivism, and gender egalitarianism provide information that is appropriate to explain the variation in information dissemination capacities across societies. However, further investigations are needed in order to verify these findings.

Research Limitations and Future Research

The findings of this research should be interpreted in the context of its limitations. Firstly, while cultural values describe the way things should be done, practices are acts or the way things are done in the culture (House, 2004). Societies may differ in their cultural values and practices along multiple, complex cultural dimensions (House *et al.*, 2004; Hofstede, 1983, 1991). Earlier research found the correlation between the cultural values and practices to be positive for gender egalitarianism, positive but insignificant for in-group collectivism, and negative for the other seven dimensions (Javidan *et al.*, 2004). These negative correlations between cultural values and practices are contrary to the conventional wisdom in the literature, as cultural practices are expected to be driven by cultural values and that there is a linear and positive relationship between them (Schein, 1992; Hofstede, 1980).

In addition, Javidan *et al.* (2006) suggest that cultural practices are more appropriate predictors of societal phenomena. This research has sought only a national culture values interpretation for the societal IDC differences. Therefore, future research designs should explore a cultural practices interpretation for the societal IDC phenomenon and compare the results with the findings reported in this research.

Secondly, a surrogate measure was adopted for societal IDC because of the lack of direct, objective measures. However, other possible societal information dissemination indicators, such as the numbers of wired and wireless telephone networks, telecommunication expenditure, number of Internet cafés, and expenditure on information and communication

technologies in education, are not included in this research. Future research designs should provide a more precise definition for the 'societal IDC' construct, and adopt more direct, objective measures to accurately operationalize the construct.

Thirdly, prior research on national culture found significant relationships between a number of cultural dimensions and societal effectiveness measures such as economic health (e.g., economic prosperity, economic productivity, government support for economic prosperity, societal support for economic competitiveness), success with science and technology *(e.g.,* success in applied science, success in basic science), and human condition (e.g., societal health, human health, life expectancy, general satisfaction, psychological health) (House *et al.*, 2004). More specifically, cultural practices were found to correlate with many of these socioeconomic indicators. This research did not identify and control for the possible impact that these intervening socioeconomic factors could have had on the relationships between IDC and cultural values. Therefore, the relationships detected in this research could be confounded. Future research should verify these findings by adopting designs that explicitly identify and control for the impact that socioeconomic indicators may have on the relationship between cultural values and societal IDC.

Conclusion and Implications

This research adopted the national cultural taxonomy of House *et al.* (2004) and information age statistics from the International Development Indicators of the World Bank (2004) to explore the relationship between national culture and IDC at the societal level. Nine hypotheses were tested, and only one hypothesis (e.g., gender egalitarianism) was supported. However, significant relationships were detected between three other national culture dimensions--namely, uncertainty avoidance, future orientation, and institutional collectivism--and IDC.

Countries that have high information dissemination capacities have a pattern of low uncertainty avoidance, low future orientation, low institutional collectivism, and high gender egalitarianism values. Collectively, uncertainty avoidance, instructional collectivism, and gender egalitarianism values explain 0.70 of the IDC variance in the investigated countries.

In spite of its explanatory nature and limitations, this research introduces a new cultural perspective that explains IDC differences among societies. Its finding puts forward culturally-based implications for policies

and decisions pertinent to improving societal IDC. Cultures shift rather slowly (Gelfand *et al.*, 2004). As such, in the short term, policy makers may only view the culture of a country as a status quo. Policies should be formulated to enhance IDC in a country, depending on its specific cultural profile.

Short term policies should leverage the cultural values (e.g., low uncertainty avoidance, low future orientation, low institutional collectivism, and high gender egalitarianism) that are considered favorable to the acquisition and development of systems and tools that enhance IDC.

Long term policies, however, should target shifting the cultural values in favor of the adoption of systems and tools that enhance IDC. Policies must be comprehensive, and cover the economic, social, political, educational, and culture aspects of a country. At the same time, policy makers should effectively utilize improving IDC to share the requisite policies and needed change information with the people and institutions in order to accomplish its long term favorable, spiral cultural changes.

Appendix A
The Countries Included in the Data Set (N = 61)

1	Albania	32	Japan
2	Argentina	33	Kazakhstan *
3	Australia	34	Kuwait *
4	Austria	35	Malaysia
5	Bolivia	36	Mexico
6	Brazil	37	Morocco *
7	Canada	38	Namibia
8	China *	39	Netherlands
9	Colombia	40	New Zealand
10	Costa Rica *	41	Nigeria
11	Czech Republic	42	Philippines
12	Denmark	43	Poland
13	Ecuador	44	Portugal
14	Egypt	45	Qatar *
15	El Salvador	46	Russia
16	England	47	Singapore
17	Finland	48	Slovenia
18	France	49	South Africa Black sample
19	Switzerland	50	South Africa White sample
20	Georgia	51	South Korea *
21	Germany West	52	Spain
22	Germany East	53	Sweden
23	Greece	54	Switzerland
24	Guatemala *	55	Taiwan *
25	Hong Kong	56	Thailand
26	Hungary	57	Turkey
27	India	58	USA
28	Indonesia	59	Venezuela
29	Ireland	60	Zambia
30	Israel	61	Zimbabwe
31	Italy		

* Countries that were excluded from the data set due to missing IDC-Index data.

Appendix B
Pearson Correlations between the National Culture Dimensions Value and IDC-Index using Z-Scores

	FO-V	INSC-V	HO-V	PO-V	INGC-V	PD-V	GE-V	AS-V	IDC-Index
UA-V	.638(**)	.427(**)			.349(**)		-.475(**)		-.805(**)
	.000	.001			.006		.000		.000
FO-V	1	.495(**)	.378(**)	.691(**)	.656(**)	-.360(**)			-.573(**)
		.000	.003	.000	.000	.004			.000
INSC-V		1	.053	.432(**)	.353(**)	-.382(**)		-.282(*)	-.520(**)
			.686	.001	.005	.002		.028	.000
HO-V			1	.604(**)	.265(*)	-.618(**)	.303(*)		
				.000	.039	.000	.017		
PO-V				1	.698(**)	-.610(**)	.296(*)		
					.000	.000	.021		
INGC-V					1	-.423(**)	.228		
						.001	.077		
PD-V						1	-.521(**)	.292(*)	
							.000	.022	
GE-V							1		.440(**)
									.001
AS-V								1	

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

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الملخص

تفسير ثقافي مبدئي لتفاوت طاقات البث المعلوماتي للمجتمعات: دراسة استكشافية

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هدفت هذه الدراسة إلى استطلاع إمكانية تفسير تفاوت طاقات البث المعلوماتي للمجتمعات على أساس اختلاف ثقافاتها الوطنية National Cultures، معتمدة على الإطار النظري للثقافة الوطنية الذي اقترحه هاوس وزملاؤه (٢٠٠٤). ويشتمل هذا الإطار على تسعة أبعاد للثقافة الوطنية تعكس توجهات أفراد المجتمع نحو: قبول التفاوت في السلطة داخل المجتمع Power Distance، وتجنب عدم التأكد Uncertainty Avoidance، والتوجه المستقبلي Future Orientation، والتعاون المؤسسي Institutional Collectivism، والرغبة فى العمل الجماعي In-Group Collectivism، والتوجه الإنساني Humane Orientation، والتوجه الإنجازي Performance Orientation، ومساواة المرأة بالرجل Gender Egalitarianism، والمثابرة Assertiveness. تم صياغة تسعة فروض لوصف العلاقات المتوقعة بين كل من أبعاد الثقافة الوطنية وطاقة البث المعلوماتي، واستخدام بيانات الثقافة الوطنية لأحدى وستين دولة (هاوس وزملاؤه، ٢٠٠٤)، وستة مؤشرات من مؤشرات التنمية الدولية المنشورة في تقريرالبنك الدولي لعام ٢٠٠٤ لاختبار فروض الدراسة. أظهرت النتائج أن المجتمعات التي تتميز بطاقات بث معلوماتية مرتفعة تتميز أيضا بمستوى منخفض من تجنب عدم التأكد، ومستوى منخفض من التوجة المستقبلي، ومستوى منخفض من التعاون المؤسسي، ومستوى مرتفع من مساواة المرأة بالرجل. كما أظهر التحليل أن الأبعاد الثلاثة للثقافة الوطنية المتمثلة فى تجنب عدم التأكد والتعاون المؤسسي ومساواة المرأة بالرجل تفسر ٧١٪ من التغاير فى طاقات البث المعلوماتى للمجتمعات. هذه النتائج تم مناقشتها، بالإضافة إلى عرض لمحددات الدراسة وإسهاماتها النظرية والتطبيقية.

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