RELATIONSHIPS AMONG INTELLECTUAL CAPITAL,UNCERTAIN KNOWLEDGE, AND CULTURE

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ABSTRACT

This exploratory study examined the uncertainty of knowledge within an organization's environment and its impact on the retention and development of intellectual capital (IC). It further explored the extent that certain internal cultural features impact IC. Findings suggest that as knowledge uncertainty increases, IC opportunities are lost in greater numbers, there are more individual and organizational disconnections, and there is a greater suppression of IC. These outcomes suggest the need for a greater emphasis on IC where knowledge uncertainty is high. Cultural characteristics relating to organizational individualism, high power distance, and short-term orientation can be detrimental to the retention and creation of IC.

INTRODUCTION

The topics of intellectual capital (IC), knowledge management, and intellectual property continue to interest companies hoping to reap benefits from assets generally not recorded on the balance sheet. While suggesting that countries and industries with large numbers of knowledge workers must emphasize IC development, the IC literature generally remains silent in providing specific criteria to apply to determine if organizations would benefit from undergoing change to develop more rigorous IC processes. Further, this literature often fails to identify organizational characteristics that impede or promote the implementation of IC development initiatives, leaving managers unsure of the need to develop IC and the challenges they will face should IC development programs be undertaken in their organizations.

The current exploratory study sheds light on the issues mentioned above by identifying important characteristics pushing organizations towards IC development. It explores the possibility that the *rate of change of knowledge* for the organization (the degree of knowledge uncertainty) ought to dictate the degree of emphasis that an organization places on the development of its IC. Furthermore, it identifies various *cultural characteristics* conducive to IC development.

INTELLETUAL CAPITAL AND THE EXTERNAL ENVIRONMENT

An often cited definition of IC by Thomas Stewart (1997) suggests that IC creates wealth for the organization as follows: "intellectual material-knowledge, information, intellectual property, experience - that can be put to use to create wealth" (p.xx). A crucial issue for organizations is to determine the appropriate extent of IC developmental emphasis. We contend that this emphasis depends upon levels of knowledge uncertainty pervading the environment surrounding the company.

Brown & Moberg (1980, p. 53) discuss four features of uncertain environments applicable to levels of knowledge uncertainty. The features include 1) the number of specific variables 2) their differences from each other; 3) their interaction; and 4) their rate of change. Therefore, knowledge is more uncertain when an organization uses different types of knowledge that interact and change frequently. The less one is able to anticipate the future with certainty, the more one needs to rely upon corporate expertise as a means of coping with the uncertainties when this future arrives.

Certainty of knowledge is not an easy concept to grasp. To better understand it, consider the example of planning a trip to Costa Rica in comparison to planning a trip to the planet Mars. The planning process for these two trips requires two very different sets of activities. For the trip to Costa Rica, knowledge is relatively *certain*. The activities require making travel arrangements with the airline or travel agent. The need for organizational expertise is minimal and an airplane, flown by a highly trained and competent pilot and flight crew, ensures that one arrives there safely.

However, for the Mars trip knowledge is far more *uncertain.* The planning process requires transfers of knowledge from information obtained from unmanned probes and other scientific sources. While a spacecraft utilizes theoretically sound systems and processes, no one has traveled to Mars before and knowledge uncertainty remains high. The space crew needs backup plans to cope with numerous possible scenarios and the members must be able to rely upon one another, as do members of SWAT teams or peacekeeping missions operating in hostile environments. This suggests that where knowledge is uncertain, reliance upon organizational expertise, processes, and relationships becomes paramount.

Extending this line of thinking to the general business environment, we suggest that when organizational expertise is highly shared among employees of a business, operating in an uncertain knowledge environment, the organization will probably have a better chance for survival than for a counterpart where knowledge is horded. Further, organizations operating in knowledge certain environments probably do not have to place strong emphasis on IC development. For example, a construction company probably requires less IC emphasis than a biotech company because knowledge change and uncertainty is far less for the former company than the latter.

Figure 1 demonstrates the relationship between type of knowledge and emphasis on IC. For quadrants A and C (for example, the construction company), knowledge is relatively certain and organizations operating in this kind of environment need less emphasis on IC. For quadrant A, low IC emphasis constitutes the correct choice, whereas for quadrant C, high emphasis represents inefficient use of time and resources.

For quadrants B and D (for example, a biotech company), knowledge is uncertain. A high emphasis on IC development is appropriate as demonstrated in quadrant D, but the low emphasis shown in quadrant B, places an organization in serious jeopardy. Radical and rapid technological change constitutes the external environment in which this firm operates. IC probably possesses a very short shelf life and the environment makes it crucial for the firm to capture it to avoid reinventing the wheel when similar problems require resolution. Such organizations, operating under these conditions, need to emphasize the rapid development and dissemination of IC through systems that motivate knowledge sharing and lead to the creation of common knowledge among the employees. Therefore, in this study, levels of knowledge uncertainty of external environments of organizations were examined to determine if IC losses increased when uncertainty exists, possibly suggesting the need for greater IC emphasis in such firms.

ORGANIZATION CULTURE AND INTELLECTUAL CAPITAL

Probably Edgar Schein (1984, p.3) provides one of the most frequently recognized definitions of culture in the literature which, in part, suggests that it is “a pattern of basic assumptions” passed on to new members of an organization to deal with external adaptation and internal integration problems. Researchers recognize that culture supports or hinders achievement of organizational objectives (Schein, 1986) and the role of culture receives increasing attention with reference to the organization’s intangible assets as critical success factors.

Figure 1: The Relationship Concerning Uncertainty of Knowledge and Emphasis on IC

Emphasis on IC	Uncertainty of Knowledge: Low	Uncertainty of Knowledge: High
Low	A Status Quo	B High Risk
High	C Inefficient	D Status Quo

Source: Herremans, Irene M. and Isaac, Robert G. (2005), "Management planning and control: Supporting Knowledge Intensive Organizations." *The Learning Organization*, Vol 12 No 4, pp. 320.

Chiavenato (2001) describes today's working environment, in part, as moving from stability to change, from command to orientation, and from solitary to collective activity. Because ambiguity and uncertainty exists in the working environment, democratic and inspirational leadership with fewer hierarchical levels is more accommodating to this environment. Teamwork, participative decision making, and group synergy is replacing individual activity. New work structures demand dialogue, direct and open communication, and deep concern with organization climate and employee satisfaction (Chiavenato, 2001).

Keeping Schein's culture definition in mind, De Long and Fahey (2000) suggest that culture shapes assumptions about the essence of knowledge and that it mediates relationships between individual and organizational knowledge. Further, it creates the context for social interaction and shapes processes through which the organization realizes knowledge creation, legitimatization, and distribution. Culture dictates what knowledge belongs to the entire organization, subunits, or individuals.

Several studies provide evidence supporting the importance of organizational culture in either knowledge management or intellectual capital development programs. Chamish (2001) found an organization's success in establishing a knowledge management program was due to first establishing an appropriate cultural infrastructure. American Productivity & Quality Center (APQC) found that collaboration facilitated knowledge sharing (Carlin and Womack, 1999). Gold, Malhotra and Segars (2001) found that organizational capabilities, including a culture of encouraging employee interaction, are preconditions for effective knowledge management. McDermott and O'Dell (2001) linked the act of sharing knowledge to widely held core values.

Many authors recognize culture as one of the main obstacles in realizing the potential of intangible assets (Schein, 1996; von Krogh, 1998; O'Dell & Grayson, 1998, DeLong and Fahey, 2000). However, a lacuna exists in the literature describing characteristics for the "right" organizational culture that facilitate IC development programs.

To investigate what features create cultures conducive for IC development, three of the five dimensions of culture that Hofstede (1980, 1991) originally identified in the measurement of national cultures are utilized in the current study. Because Hofstede's work is recognized in the international business literature, it is reasoned that if nations possess these cultural dimensions, organizations probably possess them as well and they likely influence organizational ability to develop IC programs. Below, the three pertinent Hofstede dimensions of culture are briefly described in relation to the development of IC within an organization.

First, societies differ on the individualism-collectivism dimension, and probably the same thing applies to organizations. Should organizations emphasize the benefits of independent, rather than collective efforts, they may experience problems of knowledge hording rather than knowledge sharing, making it difficult to develop IC (O'Dell & Grayson 1998). Should individual, rather than collective rights, achievements, recognition, and rewards assume importance to a particular culture, employees may find it more difficult to develop shared expertise and work in teams (Nonaka & Konno, 1998; O'Dell & Grayson, 1998). Group synergy does not develop from solitary activity, but rather collective and collaborative behavior (Carlin & Womack, 1999; Chiavenato, 2001). Therefore, we suggest that organizations with cultures of individualism will probably find it harder to implement IC development programs.

Second, societies differ considerably in how people relate to one another, based on power and authority structures, in terms of expecting deference from members of society occupying lower social positions towards those occupying higher social positions. Similarly, strong power distance within an organizational culture probably dictates the observance of proper channels of communications through formal means of address. Status differences impede cross-functional knowledge sharing (DeLong and Fahey, 2000). If IC relies upon the transformation of individual knowledge into common knowledge, then formal relationships between parties hampers knowledge sharing processes (Szulanski, 1996). Conversely, informal relationships support IC development as knowledge becomes easier and faster to share.

IC development flourishes in an environment where few hierarchical levels exist (Chiavenato, 2001), and where there is an ongoing process of identifying and sharing IC practices among employees of the organization (Tan, 2000). Conditions exist that promote employee perceptions of approachability regarding discussions about sensitive topics, facilitating collaboration, interactivity, and the reuse of existing knowledge, when a culture emphasizes horizontal (rather than vertical) interactions (DeLong and Fahey, 2000). Therefore, we suggest that high power distance within an organization's culture tends to inhibit the sharing of knowledge, whereas lower power distance levels ought to improve organizational effectiveness regarding IC development.

Third, some societal cultures take long term viewpoints in their approaches towards thinking and planning, whereas other cultures possess short term perspectives. Similarly, organizational cultures possess long or short term orientations. We suggest that organizations with short term orientations fail to capture IC because they are worrying about handling today's problems rather than preventing future problems. Attempts to capture and share knowledge arising from past situations for future use are probably rare due to imminent pressures faced by employees and they are perceived as too expensive. Conversely, organizations with long term perspectives are interested in developing employees to be able to adapt their skills to changing environments. Therefore, these organizations are willing to invest in knowledge sharing processes and procedures that may not provide an immediate return. Workforce knowledge development comes with experience and education that evolves over the long term and a long term cultural orientation ought to facilitate IC development.

METHODOLOGY AND PROPOSITIONS

In light of the above discussion, this exploratory study sets out to find answers to two research questions: Given varying degrees of knowledge uncertainty in external environments, is knowledge uncertainty associated with greater emphasis on IC?

What organizational culture characteristics support or hamper IC realization within organizations?

To answer both questions, two exploratory exercises took place constituting phase one and two of this study, representing qualitative and quantitative approaches respectively.

Regarding phase one, as part of a university course, low level to middle level managers viewed a video of a very successful international consulting firm that has few tangible assets and an acute awareness of the necessity of realizing its IC to its fullest. After watching the video, subjects provided information through an open-ended questionnaire as to why this firm enjoys success and whether their own organizations needed more emphasis on IC. They also identified cultural barriers to change. Results were content analyzed to derive variables employed in phase two and establish face validity. From the findings of phase one, a new Likert scale questionnaire was prepared for use in phase two and the questions were designed to test four propositions as follows:

Proposition One:

> The greater the level of uncertainty of knowledge of the organization's environment, the greater the organization needs to emphasize IC.

Proposition Two:

> The greater the organizational individualism, the less conducive the organization's environment will be to the retention and development of IC.

Proposition Three:

> The higher the power distance, the less conducive the organization's environment will be to the retention and development of IC.

Proposition Four:

> The greater the short-term orientation, the less conducive the organization's environment will be to retention and development of IC.

For phase two, an MBA class was used as an avenue to access entrepreneurial organizations, some of which experience rapid change in knowledge. In the program, the students worked in teams with specific organizations as part of a consultative learning experience. Part of the students' experience required an investigation of the organization's learning systems. Therefore, the student teams distributed the Likert scale questionnaire (developed from phase one) among employees of their respective organizations, attempting to select a representative variety of levels and functions. The researchers and the students analyzed the information provided in the questionnaires.

PHASE ONE RESULTS

Content analysis of the manager's open-ended questions confirmed inferences drawn from the literatures discussed earlier, leading us to develop the four propositions presented. Examples of statements made by these managers (presented in Table 1 for each of the propositions) suggest that levels of environmental knowledge certainty and three internal cultural variables are important. The three cultural variables include individualism/collectivism, power distance, and short-term/long-term orientation (Hofstede, 1980, 1991) in relation to the extent that they facilitate or inhibit the development of IC. Two of Hofstede's original cultural dimensions were not included in phase two as there was little evidence that masculinity/femininity or uncertainty avoidance would affect IC development.

Table 1: Managers' Observations Related to Four Propositions

Proposition Number	Related Managerial Observations
One	1. [We must have] the ability to make decisions quickly in order to capture opportunities.
	2. [We often find ourselves] completing projects within short cycle times.
	3. [It is essential that we have the] ability to develop or drop processes quickly. 4. [We have implemented] rigorous and formal controls that allow the organization the flexibility to abandon any processes that are not achieving the company's goals. 5. We have several patents that are expiring; therefore, competitors will be able to produce substitute products very quickly.
	6. In a fast-paced environment, communication among groups is sometimes sacrificed; because this environment does not lend itself to documentation.
Two	1. [It is important] to have a teamwork-oriented culture: trust and synergy among partners with a complementary set of expertise and skills.
	2. [There is an] interdependence of the partners; [they do] not operate in silos.
	3. In a large company it would be almost impossible (but also ideal) to have all employees with the same set of values and attitudes toward work and ethics.
	4. Employees in larger organizations often hoard information or in some cases attempt to make others look bad in order to promote themselves.
	5. [Some] feel threatened by giving all of their knowledge.
	6. Due to the size and structure of our company, work activities are sometimes duplicated by different departments because there is a lack communication or understanding as to how other departments fit into the organization and what they do.
	7. Turf battles and protectionism thwarts many attempts to build networks, trust, and credibility.
Three	1. The organizational structure is based on a self-regulated participation group without any supervisory structure. The control system is essentially the internal motivation of the participants.
	2. [Members of the organization] work independently without an authority structure.
	3. The flat structure insists that employees take responsibility for their actions, but some are not confident enough in their own knowledge to feel comfortable working in this type of environment.
Four	1. My organization has a yearly turnover of approximately 15 percent with little knowledge sharing and capture; therefore, a fair amount of time is used in re-creating materials that already existed.
	2. We have no apprenticeship or mentoring program that helps transfer knowledge from our highly talented long-term employees to our younger employees.
	3. We rely very heavily on consultants for short and medium-term projects, generally two to eight months. Significant knowledge and information is lost as soon as the consultants leave.
	4. We do not have any method in our organization to capture ideas in order to communicate them to another time or another situation. This is particularly troublesome because, with offices throughout North America, one group often reinvents a solution to a problem that another group in another office has already addressed.
	5. [It is important to have] an inherent understanding among the employees of the need to understand why we're doing what we are doing rather than simply how we do what we do

For uncertainty of knowledge (proposition one), the less employees are able to anticipate their futures, the more they need to rely upon corporate expertise as a means of coping with the uncertainties. To compete in a fast-paced knowledge environment, organizations must place more emphasis on IC. The six managers' observations shown in Table 1 lend support for this conclusion.

Relating to individualism/collectivism (proposition two), the first three observations from the managers' questionnaires provide evidence for the necessity of having a culture exhibit some collectivism characteristics to support IC development. The remaining four observations demonstrate that a culture with strong individualism characteristics could hinder the development of an IC program dedicated towards the sharing of knowledge.

Regarding power distance (proposition three) the three managers' observations imply that low power distance is more conducive to a creative, sharing environment, necessary for the development and

realization of the organization's IC. The observations suggest that these organizations choose to decentralize decision-making rights and shift from formal to informal communications promoting IC development.

Finally, concerning short/long term orientations (proposition four), the first four observations suggest that an organization culture that promotes short-term thinking makes it more difficult to develop and realize IC. By contrast, as demonstrated by the fifth observation, an organization with a long-term focus would be interested in developing its employees to be able to adapt their skills to a changing environment.

PHASE TWO RESULTS

Subjects and Organizations

The questionnaire was administered to 71 respondents in 11 firms that were participating in an MBA company program. Multiple levels and functional areas within each company were surveyed. All companies were owner-managed, ranging in size from 17-130 employees. Due to the mission of this MBA program, all companies were entrepreneurial in nature, most non-public, and generally successful. Some were involved in international activity. The data collected represented broad industry sectors and a mix of service and product businesses.

Questionnaire and Factor Analyses

Subjects rated all items on the questionnaire by choosing numbers that ranged from one (disagree) to five (agree) on a Likert-type scale. The questionnaire contained 30 statements. For the 14 statements pertaining to IC emphasis, principal component analysis indicated a three-factor solution (minimum eigenvalue of 1.0), explaining 59.79 percent of the variance. Factor 1 represents the relationship between the individual and the organization and considers knowledge linkages and networks that help to connect the individual with the organization, making knowledge transfer easier. This factor is referred to as the *IC individual/organization connections* (F = 5.562, alpha = .76, representing seven questions). Factor 2 represents opportunities lost by the organization due to a lack of properly identifying, managing, and measuring IC. This factor is named *IC opportunities lost* (F = 1.779, alpha = .84, representing five questions). Factor 3 represents organizational characteristics such as routinization and turnover that retard IC development or leads to its loss. This factor is called *IC suppression* (F = 1.029, alpha = .61, representing two questions).

While the IC suppression factor did not possess the traditional .70 reliability level generally considered acceptable for research purposes, Nunally (1978) suggests that alphas of .50 or higher are satisfactory when engaging in exploratory research that tests theory in the early stages of development (Sommer, Bae, and Luthans, 1996).

Examples of statements relating to the *IC individual/organization connections* factor (factor one) included statements such as "strategic information impacting the realization of corporate objectives is not readily available" and "features of our information systems fail to capture organizational knowledge." For the second factor, *IC opportunities lost*, statements included "intellectual capital (IC) assets are not recognized or safeguarded from risk" and "the loss of IC is not appreciated until someone leaves." Finally, the two statements forming the third factor, *IC suppression*, included "most employees continue to use the same methods without asking, is there a better way to do this?" and "higher turnover causes the loss of IC."

Questions representing uncertainty of knowledge were factor analyzed. The analysis provided two factors explaining 51.68 percent of the variance. Factor 1 represents the degree and speed of knowledge

uncertainty occurring within the organization. This factor is labeled *speed and degree of knowledge uncertainty* (F = 2.464, alpha = .67, for five questions). Factor 2 represents the employees or organization's ability to adapt to knowledge uncertainty and is labeled *ability to adapt to knowledge uncertainty* (F = 1.154, alpha = .42, for two questions). Since the reliability for this second factor failed to meet the minimum alpha criterion of .50, this scale was excluded from all further analysis. Due to this exclusion, the remaining five statements associated with the first factor were simply referred to under the original name for the statements for this issue, namely the *uncertainty of knowledge scale*.

Finally, questions from each of the culture dimension scales were factor analyzed and tested for reliability. In all cases, single factor solutions were noted as follows:

- Power Distance (F = 1.712, alpha = .61, for three questions)
- Collectivism (F = 1.661, alpha = .60, for three questions)
- Long term (F = 1.963, alpha = .73, for three questions)

It is necessary to note that the identification of a three-factor solution for IC emphasis necessitates an examination of 12 propositions, rather than the four propositions originally proposed earlier. Each of these four propositions require testing in relation to *IC individual/organization connections*, *IC opportunities lost*, and finally, *IC suppression*, all of which are factors that reflect various aspects of organizational emphasis on IC.

Testing of Propositions

Pearson correlations tested the degree of association between the three IC emphasis factors (*IC individual/organization connections*, *IC opportunities lost*, and *IC suppression*) and the four proposition variables (uncertainty of knowledge, individualism, power distance and short-term). The results are shown in Table 2.

All the propositions associated with uncertainty of knowledge were supported (proposition one set, $p < .01$), in relation to the three factors concerning IC emphasis. Thus, in all cases, it appears that the greater the perceived level of environmental uncertainty of knowledge, the greater the number of problems associated with IC retention and development. Thus, assuming causation, the obvious conclusion suggests that organizations operating in environments where knowledge is highly uncertain need to emphasize IC development and retention.

Two of the individualism propositions (proposition two set) were not supported in relation to factors one and three of the IC emphasis variable. Only the individualism proposition relating to IC opportunities lost was supported ($p < .01$). Support for this proposition suggests that a positive relationship exists between individualism and the number of IC opportunities lost (as individualism increases, so do the number of opportunities lost).

It is interesting to note that the IC individual/organization connections and IC suppression propositions were not supported regarding the individualism culture. However, this is not really surprising. In the first instance, statements relating to the availability of strategic information and organizational information systems failing to capture knowledge do not directly relate to any form of individualist employee activity. In the second instance, turnover and task routines similarly have little to do with cultural individualism, assuming causation.

Table 2: Correlation of Variables with Three IC Factors

Propositions	IC Individual/ Organizational Disconnections	IC Opportunities Lost	IC Suppression (Retards IC Development)
1. The greater uncertainty of knowledge....	....the greater the individual /organizational disconnections (.549, p < .01)	....the more IC opportunities are lost (.436, p < .01)	....the greater the IC suppression (impact of turnover and routinization) (.363, p < .01)
2. Greater organization individualism	....no impact on individual/ organizational disconnections (.133, n.s.)	....the more IC opportunities are lost (.313, p < .01)	....no impact on IC suppression (.031, n.s.)
3. Higher power distance	....the greater the individual /organizational disconnections (.557, p < .01)	....the more IC opportunities are lost (.330, p < .01)	....the greater the IC suppression (impact of turnover and routinization) (.316, p < .01)
4. Greater the short-term orientation	....the greater the individual /organizational disconnections (.492, p < .01)	....the more IC opportunities are lost (.402, p < .01)	....the greater the IC suppression (impact of turnover and routinization). (.362, p < .01)

Pearson correlations, two-tailed tests, N = 71; n.s. = not significant

To explain the lack of findings another way, individualism on an aggregate basis may be measured in an organization, but it still remains fundamentally a personal characteristic of each employee. The other factors relating to power distance (high vs. low) and time length orientation (short vs. long-term) of the organization culture are imposed upon the employee. Thus for individualism, the level of turnover and the routinization of jobs really does not relate to the level of personal individualism displayed throughout the organization (IC Suppression), nor does the availability of strategic information or organizational information system's abilities to capture knowledge (IC Individual/Organizational Disconnections). However, it does relate to IC Opportunities Lost regarding issues such as dependency on a few key individuals (due to a lack of sharing) and a failure to measure IC in the first place.

High power distance and all three IC emphasis factors (proposition three set, $p < .01$) were positively associated suggesting that high power distance makes it difficult for organizations to retain and develop IC, whereas low power distance is conducive to the realization of organizational IC. The same conclusion is made regarding the positive relationship between short-term orientation and the three IC emphasis factors (proposition four set, $p < .01$), assuming causation in each case.

DISCUSSION

Findings of this exploratory study indicate that uncertainty of knowledge constitutes a crucial variable in relation to an organization's emphasis on IC. This appears logical when an organization finds itself in situations that are extremely difficult to predict and where the certainty of the knowledge is minimal. It must rely upon corporate 'know how' to secure its ongoing survival, just as the members of a police swat team learn to rely upon one another as they walk into an unknown and potentially hostile situation.

Emphasis on IC also ensures that the organization works smart rather than simply works hard to remain competitive.

Support for the findings that the three culture variables of long-term orientation, low power distance and collectivism come as no surprise in terms of the role they play in assisting to create an organizational environment that is conducive to the development and realization of IC. Long-term orientation ought to facilitate IC emphasis because the organization is collecting knowledge tools that will enable ease of travel along the pathway to its future. Conversely, a short-term emphasis suggests a vicious circle of encountering problems and rapidly solving such problems to continue to survive - a treading water approach to managing IC - without attention to capturing this IC for use in future situations.

Low power distance primarily facilitates communications vertically, but when formality of communication is not required in an upwards direction, communication flow is enhanced horizontally as well. Thus, knowledge spreads rapidly throughout the organization. Collectivism implies knowledge sharing through teamwork to secure an acceptable continuously emerging future, whereas individualism suggests knowledge hording. In a technologically complex world, emphasis on individualism needs to give way to collectivism simply because the individual no longer knows enough to go it alone. Thus, organizational cultures that possess collectivist characteristics should find the internal environment more conducive to the development and realization of IC.

In summary, managers need to assess and monitor levels of knowledge certainty/uncertainty in the external environment and adjust their emphasis on the development of IC accordingly. Further, they need to monitor their organization's cultures to ensure that conditions exist that permit them to emphasize IC development when it is required. Limitations of the study include its exploratory, rather than explanatory, nature. Furthermore, subjects used in the study were drawn from 11 different organizations but not in equal numbers from each organization. Therefore, employees who participated in larger numbers from some of the organizations could bias findings of this study, due to their disproportional representation.

Future research dictates the examination of uncertainty of knowledge, in terms of the organization's internal and external environments. Research needs to examine the role that organizational climate plays in making an organization's internal conditions amenable to an increased emphasis on IC development. Climate involves issues such as trust, openness, ownership of ideas and risk-taking (Golembiewski, 1979) and it could play a major role in hampering or facilitating IC development. Other relevant issues deserving consideration in the development of organizational IC include groupthink, territorialism, and organizational citizenship. Research efforts are currently underway to examine all of the above issues.

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