Shaping knowledge management: organization and national culture

Rémy Magnier-Watanabe and Dai Senoo

Abstract

Purpose – The purpose of this paper is to confirm quantitatively the previous finding that organizational characteristics influence knowledge management, and to assess whether the national culture of knowledge workers equally affects the management of knowledge.

Design/methodology/approach – Based on data gathered from a questionnaire survey of a Japanese pharmaceutical company’s 14 foreign subsidiaries, the effects of organizational characteristics and national culture on knowledge management were tested using multiple regression analysis.

Findings – Although organizational characteristics and national culture were found to affect knowledge management, the data showed organizational characteristics to be a stronger prescriptive factor compared with national culture.

Research limitations/implications – Because this research centered on a single company in the pharmaceutical industry, future research should attempt to confirm the validity of this framework in other industries.

Practical implications – Changes in organizational characteristics, such as structure and relationship in particular, rather than adjustments in the composition of employees’ nationalities, will have a stronger impact on the resulting knowledge management.

Originality/value – This framework linking organizational characteristics and national culture to knowledge management had received a first justification using a case study approach with a qualitative comparative method and has now been confirmed with a quantitative approach. Among the predictors of knowledge management beyond the realm of deliberate measures within the firm, the data show that organizational characteristics exert a stronger influence than national culture.

Keywords Knowledge management, National cultures, Organizations, Cross-cultural management

Paper type Research paper

Introduction

Competitive advantage has been shown increasingly to rely on the effective management of knowledge (Bukowitz and Petrash, 1997; Stewart, 1997). This is particularly relevant for multinational firms, which may adapt not only the organizational structure of the subsidiary to the host country, but also its knowledge management practices in expanding abroad. Indeed, Drucker et al. (1997) have identified “harnessing the intelligence and spirit of people at all levels of an organization to continually build and share knowledge” as a top priority for firms wishing to succeed in today’s competitive environment (Chow et al., 2000). Considering that the perceptions and behaviors associated with the management of knowledge greatly depend on those who put it into practice, i.e. knowledge workers, KM can no longer be solely attributed to the firm’s management, but should take into account local personnel who may create it and apply it in its daily tasks.

Turner and Makhija (2006) suggest that “any given control mechanism has the capacity to affect both the nature and flow of knowledge in a firm by the manner in which it processes particular attributes of knowledge” (p. 213) and they contend that these control systems influence each stage of the knowledge management process. In addition,
organizational climate and organizational structure have been recognized as shaping knowledge management (Chen and Huang, 2007). In fact previous research has shown that the very organization of the firm (Magnier-Watanabe and Senoo, 2008) and national culture (Möller and Svahn, 2004; Martinsons and Davison, 2007) constrain and influence the nature of KM.

This research builds on the framework introduced by Magnier-Watanabe and Senoo (2008) in which organizational characteristics – specifically structure, membership, relationship, and strategy – affect knowledge management – namely knowledge acquisition, storage, diffusion, and application. Their research acknowledges the strong role of management in the firm's handling of knowledge and suggests that practitioners can increase the yield of KM when it is integrated upstream into the elementary business processes rather than when left voluntary (Magnier-Watanabe and Senoo, 2008). This framework has already received a qualitative validation based on the case study of a Japanese company, and this paper now seeks to confirm it using a questionnaire survey. This research falls under the category of intermediate theory (Edmondson and McManus, 2007) proposing relationships between established constructs, and it is therefore suitable for hybrid data analysis consisting of both qualitative and quantitative assessment.

Theoretical background

Organization and knowledge management strategies

Today's business world is characterized by the growing complexity of global firms, information explosion and speed of decision making, and value and mobility of key employees (Mohrman et al., 2002). In economies dominated by services, where people and information are primary drivers of business, these three trends demand that knowledge and its effective management be treated with particular attention. Therefore, organizational knowledge has been promoted to the status of valuable strategic asset (Zack, 1999). Moreover, several researchers have shown that knowledge management should be rooted in the firm's strategy and that the level of linkage between the two determined the success of KM initiatives. Appropriate strategic alignment can in turn support the organization's mission and strengthen its competitive position (Davenport and Prusak, 1998; Zack, 1999). Hansen et al. (1999) have shown how a company's choice of knowledge management strategy is not arbitrary as it must be driven by the company's competitive strategy, and they warn that knowledge management should not be isolated in a functional department. They have drawn attention to the importance of the corporate organization and the significance of corporate culture in supporting the chosen KM strategy (Hansen et al., 1999). The corporate organization involves structure dealing with the size and arrangement of teams, and strategy attending to the firm's value proposition and economic model, while corporate culture consists of membership stemming from selection, training and incentives, and of relationships woven along networks and shaped by information systems.

National culture and knowledge management strategies

Dimensions of national culture have been widely used in management research where several studies have confirmed the validity of Hofstede's (1980) cultural dimensions (Ronen and Shenkar, 1985; Shackleton and Ali, 1990) and employed them to account for empirical observations (Earley, 1993; Straub, 1994; Tan et al., 1998). However, those studies have neglected knowledge management and have instead focused on the relationship between culture and other management issues (Shore and Venkatachalam, 1996). Nevertheless, a few recent research projects have given attention to the influence of culture on parts of the KM process, such as decision-making processes in American, Japanese, and Chinese firms (Martinsons and Davison, 2007), and on knowledge sharing behaviors in Eastern and Western cultures (Möller and Svahn, 2004). The study of Martinsons and Davison (2007) in particular supported the finding that the success of knowledge management and information systems in different countries and cultures depends critically on how well IT applications are adapted to the decision styles of their users.
Concepts and hypotheses

Knowledge management, organizational characteristics, and national culture

Knowledge management. A prevailing perspective of knowledge management is the knowledge management value-chain common to many KM descriptions (Shin et al., 2001; Dalkir, 2005; Chen and Chen, 2006). The four stages of knowledge acquisition, storage/sharing, diffusion, and application, although not necessarily sequential, are required to achieve the efficiency function of KM within the organization (Alavi and Leidner, 1999; Drucker, 2001). As such, the two goals of knowledge management are productivity gains through efficient decision making and problem solving, and innovation by way of bringing a new idea to market (Holsapple and Joshi, 2000). A previous thorough literature review of the history of KM evolution from 1995 to 2004 (Chen and Chen, 2006) has showed that indeed the KM process is similar to that of a value-chain. According to Chen and Chen (2006, p. 18), “the basic underlying assumption is that knowledge may be viewed from a unified perspective as it circulates in the organization creating knowledge assets and influences the performance of the organization”.

Then, knowledge management can be defined as the process for acquiring, storing/sharing, diffusing and implementing both tacit and explicit knowledge inside and outside the organization’s boundaries with the purpose of achieving corporate objectives in the most efficient manner (Magnier-Watanabe and Senoo, 2008). Although this description of knowledge management may seem best suited for explicit knowledge, it deliberately includes tacit knowledge such as beliefs, points of view, technical skills and know-how. The former is objective and rational and therefore easier to convey, and the latter is cognitive and harder to express with language or numbers.

Knowledge acquisition is the process of gaining new knowledge, from either inside or outside the organization. Even though acquisition supposes that knowledge already exists and is brought in from another location, the fact that this already existing knowledge becomes part of the organization gives it the status of new knowledge inside the firm.

Knowledge storage/sharing is especially relevant since, in general, firms are systems of cooperative behaviors where the issue of coordination remains; cooperation is the sharing of common goals, and coordination is the process of informing each worker as to the planned behaviors of the others (Simon, 1976). In this regard, public storage of knowledge enables knowledge sharing, while private storage hinders it. The role of knowledge storage is to reinforce this lack of coordination since it makes available the knowledge from and to all the members of the firm.

Knowledge diffusion deals with efficient knowledge flows, which may or may not be a priori embedded within the organization’s pattern of systematic relationships as defined in the corporate communication routes and nodes. On the one hand, formal organizations provide a set of written rules leaving very little discretion so as to the choice of communication partners throughout the company. On the other hand, informal organizations leave a large degree of autonomy to their workers to decide which communication channel and recipient (source) fit best the requirements of each situation.

“The influence of national culture on KM implies that the management of knowledge may not only depend on the organizational characteristics of the firm and its deliberate and explicit procedures and guidelines, but may also be constrained by the mental models of its practitioners drawn from national culture.”
Knowledge application can be viewed in terms of the type or amount of learning in the difference between knowledge exploration and exploitation (March, 1991; Gupta et al., 2006). Where learning occurs along a trajectory that has already been followed, then it is exploitative or incremental learning. Where learning occurs along an entirely different trajectory, then it is exploratory or experimental learning. And since the learning trajectory is specific to an individual, group or company, what may be viewed as exploitative learning by one group may be considered exploratory by others (Gupta et al., 2006).

Organizational characteristics. Magnier-Watanabe and Senoo (2008) have shown how the organization of the firm can be evaluated according to four key organizational characteristics:

1. structure (vertical or horizontal);
2. membership (individual or collective);
3. relationship (systematic or ad hoc), and
4. strategy (reactive or innovative).

This segmentation into structure and strategy on the one hand, and membership and relationship on the other hand, is consistent with the prevailing leadership theories taking roots in the seminal Ohio State University Studies (Katz and Kahn, 1953) and the University of Michigan Studies (Halpin and Winer, 1957) of leadership behaviors, and with the cultural influences of Simon (1976).

Most organizations can be classified as either vertically or horizontally structured. Some aspects of vertically structured organizations include specialized tasks, a strict hierarchy with many rules, vertical communication and reporting systems, few teams or task forces, and centralized decision-making. On the other side of the spectrum, horizontal structure involves shared tasks and empowerment, a more relaxed hierarchy with fewer rules, horizontal face-to-face communication, more teams or task forces, and decentralized decision-making (Ranson et al., 1980).

Then, the concept of membership, whereby the worker is a member of the firm, deals with the extent to which the employee feels part of that organization. To belong to an organization implies that one subscribes to the values, policies or objectives of the group, since at least contractually one is free to withdraw if an impossible conflict arises. Membership can be a source of motivation when the goals of the firm are aligned with those of the employee. Membership can be either collective or individual, depending on whether the employee identifies with one or several teams or does not recognize his or her interests in those of the group.

Next, the firm needs to identify these relationships making up the complete organizational communication network in order to capture the knowledge being transmitted. Relationships within the firm can be of two types:

1. systematic; or
2. ad hoc.

In practice, most organizations can be both formal and informal, depending on the type of action being considered. In general, informal communication deals with the selection of final goals where the selection process uses ad hoc relationships and networks or channels not necessarily defined by the formal hierarchy. However, formal communication involves the implementation of those final goals, which are usually handled through corporate transmission using systematic relationships mirroring the hierarchical structure to ensure a tight execution of the strategy.

Last, strategy is the carefully devised plan of action to efficiently achieve a corporate goal, considering that efficiency is the attainment of maximum value with limited means. Organizational decisions follow a strategy, itself carrying expectations drawn from knowledge. The role of knowledge is to increase the firm’s rationality, which involves
knowing all the consequences following from each alternative strategy and comparing all the potential outcomes (Simon, 1976). On the one hand, the purpose of an innovative strategy for an early mover is to create a sustainable competitive advantage (Porter, 1990) that is made possible only if the firm is ahead of its competition, or in other words, if it addresses a common problem through differentiation made possible by innovating. On the other hand, the goal of a reactive strategy for a late mover is to maintain its position while reacting to its competitor’s moves, usually imitating the industry leader and competing mainly on cost reduction (Gopalakrishnan et al., 1999).

National culture. Hofstede (1980) defines culture as a “collective phenomenon”, because it is at least partly shared with people who have lived within the same social environment where it was learned. It is the collective programming of the mind that distinguishes the members of one group or category of people from another. Culture is expressed through symbols, heroes, rituals and concepts, which are ordered from the most superficial to the deepest manifestations of culture. The first three are visible and can therefore be grouped under the term practices, which can be used to interpret their hidden cultural meaning. Also, as people belong to many groups at the same time, they carry several layers of cultures within themselves, i.e. national, regional, ethnic, gender, corporate level, etc. Culture propagates itself through the basic elements of society, also known as institutions, such as the family, the school, the community and the workplace (Hofstede and Hofstede, 2005). The early years spent with one’s family and in school shape the underlying values making up national culture, while the time spent working in an organization mainly yields corporate practices that are more superficial.

Hofstede’s research uncovered five dimensions of culture:

1. power distance;
2. uncertainty avoidance;
3. individualism-collectivism;
4. masculinity-femininity; and
5. time horizon (Hofstede, 1980).

Power distance is the tolerance for power disparity in society (from low to high). Individualism-collectivism is how much a given individual puts his/her interests ahead of those of the group to which he or she belongs. Masculinity-femininity relates to the emphasis on clear distinctions between emotional gender roles, where for example, in more feminine countries women are expected to stay at home to care for their offspring. Uncertainty avoidance represents the tolerance for uncertainty, ambiguity, risk and the need for formal rules (from low to high). Finally, time horizon relates to whether a person is short-term oriented or longer-term oriented. Western societies are typically more short-term oriented than are Eastern societies. For the purpose of the present research, only the first four dimensions of culture are used.

The popularity of Hofstede’s model in management research can be attributed to its codification of cultural attributes using numerical indices and an emphasis on attitudes in the workplace (Kogut and Singh, 1988; Erez and Earley, 1993). In this context, Hofstede’s research can provide a workable context within which to examine the differences in knowledge management.
Hypotheses

Organizational characteristics and knowledge management. The case study analysis by Magnier-Watanabe and Senoo (2008) showed that indeed vertical and horizontal structure supported focused and opportunistic knowledge acquisition, respectively; individual and collective membership promoted private and public knowledge storage, respectively; systematic and ad hoc relationships encouraged prescribed and adaptive knowledge diffusion, respectively; and reactive and innovative strategy fostered exploitative and explorative knowledge application, respectively. These organizational characteristics give rise to two contrasting managerial models (Simon, 1976; Nonaka and Takeuchi, 1995); the first, called “bureaucracy”, emphasizes vertical structure, individual membership, systematic relationships, and a reactive strategy; the second, called “taskforce”, stresses horizontal structure, collective membership, ad hoc relationships, and an innovative strategy. The authors pointed out that businesses are rarely of one type or the other, but rather they emerge as a mix of characteristics ranging between these two extremes. In turn, the distinct combinations of organizational characteristics produce unique organizations in need of custom-made knowledge management initiatives (Magnier-Watanabe and Senoo, 2008). The following hypotheses are derived from the previous discussion on the influence of organizational characteristics on knowledge management:

\[ H1a. \] Vertical structure \( (\text{relative to horizontal structure}) \) is positively related to focused knowledge acquisition \( (\text{relative to opportunistic knowledge acquisition}) \).

\[ H1b. \] Individual membership \( (\text{relative to collective membership}) \) is positively related to private knowledge storage \( (\text{relative to public knowledge storage}) \).

\[ H1c. \] Systematic relationship \( (\text{relative to ad-hoc relationship}) \) is positively related to prescribed knowledge diffusion \( (\text{relative to adaptive knowledge diffusion}) \).

\[ H1d. \] Reactive strategy \( (\text{relative to innovative strategy}) \) is positively related to exploitative knowledge application \( (\text{relative to explorative knowledge application}) \).

National culture and knowledge management. High power-distance societies, where power disparity and specialization are favored, may foster a focused knowledge acquisition; individualistic societies, where the interests of the individual lie ahead of those of the group, may promote private knowledge storage; masculine societies, where decisive and aggressive management is preferred over intuition and consensus, may encourage prescribed knowledge diffusion; and high uncertainty-avoidance societies, where tolerance for risk and uncertainty is low, may support exploitative knowledge application. The following hypotheses convey the influence of national culture on knowledge management:

\[ H2a. \] High power distance \( (\text{relative to low power distance}) \) is positively related to focused knowledge acquisition \( (\text{relative to opportunistic knowledge acquisition}) \).

\[ H2b. \] Individualism \( (\text{relative to collectivism}) \) is positively related to private knowledge storage \( (\text{relative to public knowledge storage}) \).

\[ H2c. \] Masculinity \( (\text{relative to femininity}) \) is positively related to prescribed knowledge diffusion \( (\text{relative to adaptive knowledge diffusion}) \).

\[ H2d. \] High uncertainty avoidance \( (\text{relative to low uncertainty avoidance}) \) is positively related to exploitative knowledge application \( (\text{relative to explorative knowledge application}) \).

Quantitative analysis

Methodology, sample selection and data collection

The analysis is using questionnaire data from a single Japanese pharmaceutical corporation founded in 1941 in Japan, referred to as JPC, which can be qualified in its industry as a medium size company with yearly sales of about $US5bn (FY2005) covering both prescription and over-the-counter drugs. Since 1989, the global corporate mission of JPC is
to be a “human healthcare company”, where employees’ first consideration is the welfare of patients and their families. On its website, JPC states that its mission “is shared by all employees and rises above nationalities, national borders, gender, and age”. JPC has also rolled out a global KM initiative to harness, focus and promote the knowledge creation power of its global group as a whole. It is a program designed to achieve a group-wide culture and identity of innovation. The present quantitative analysis is drawing on questionnaire data collected in 2005 from a 200-item survey instrument using a five-point Likert scale that was developed over several years with the collaboration of professors of knowledge management from a number of Japanese national universities.

JPC has been involved in knowledge management initiatives for years and has dedicated a team to monitor and implement relevant projects aimed at boosting the yield of KM activities. And because the Japanese workforce has received extensive training on knowledge management, it was excluded from the present analysis. Therefore, only JPC’s workforce outside Japan (in descending order of headcount, with number of respondents and percentage to total) in the USA (634; 36.8 percent), Indonesia (298; 17.3 percent), China (214; 12.4 percent), Great Britain (108; 6.3 percent), Taiwan (96; 5.6 percent), Germany (76; 4.4 percent), Thailand (60; 3.5 percent), The Philippines (59; 3.4 percent), France (58; 3.4 percent), Korea (46; 2.7 percent), Spain (30; 1.7 percent), Malaysia (26; 1.5 percent), Hong Kong (13; 0.8 percent), and Singapore (6; 0.3 percent), who have not benefited from the same intensive and regular KM-specific education, were included in the sample, making up a total of 1,724 people. The entire workforce of JPC outside Japan was surveyed with a return rate of 100 percent (since the questionnaire was conducted in close cooperation with JPC’s top management as part of their yearly evaluation of KM) and is consequently included in the survey. The questionnaire data includes responses from several different countries, providing the necessary data to assess the effect of national culture on knowledge management using Hofstede’s existing cultural dimension scores (Hofstede and Hofstede, 2005).

Selection and operationalization of constructs

This research hypothesizes that knowledge management is subject to influences embedded both in the pattern of organizational constraints of the firm and in the learned behaviors of its contributors (Garud and Kumaraswamy, 2005). As such, knowledge management can be divided between individual KM (KMi) and group KM (KMg) as the actual values and routines of the individual may differ from those advocated by the group when it comes to the management of knowledge (Kelloway and Barling, 2000). For example, while some individuals may feel more comfortable using existing knowledge to yield greater efficiency, the group may alternatively encourage a more explorative approach leading to the creation of new knowledge.

Therefore, different questions were selected when possible to measure the influence of organizational characteristics on KM on the one hand, and the effect of national culture on KM on the other hand. In the former, individual KM questions (KMi) were selected for storage (STOi) and diffusion (DIFi) and group KM questions for acquisition (ACQg) and application (APPg), while in the latter, KM questions pertaining to the group or organization (KMg) were picked for all four knowledge activities (ACQg, STOg, DIFg, APPg) (Table I).

For knowledge acquisition, a higher score reflected opportunistic knowledge acquisition, whereas a lower score reflected focused knowledge acquisition. For individual knowledge storage, a higher score represented private knowledge storage, whereas a lower score represented public knowledge storage. For group knowledge storage, a higher score indicated public knowledge storage, whereas a lower score indicated private knowledge storage. For both individual and group knowledge diffusion, a higher score signaled ad-hoc knowledge diffusion, whereas a lower score signaled prescribed knowledge diffusion. And for knowledge application, a higher score corresponded to explorative knowledge application, whereas a lower score corresponded to exploitative knowledge application.

Organizational characteristics were measured using appropriate questions on structure, membership, relationship, and strategy. Concerning the structure variable, only an
individual question was found to be relevant for the construct, while the other three organizational characteristics could be assessed using general statements about the firm (Table II). For structure, a higher score reflected horizontal structure, whereas a lower score reflected vertical structure. For membership, a higher score represented collective membership, whereas a lower score represented individual membership. For relationship, a higher score indicated ad hoc relationship, whereas a lower score indicated systematic relationship. And for strategy, a higher score signaled innovative strategy, whereas a lower score signaled reactive strategy.

Existing cultural dimensions scores published by Hofstede and Hofstede (2005) were used since they have shown to be reliable and have been corroborated in several subsequent surveys (Ronen and Shenkar, 1985; Shackleton and Ali, 1990). For power distance (PDI), a higher score reflected high power distance, whereas a lower score reflected low power distance. For individualism-collectivism (IDV), a higher score represented individualism, whereas a lower score represented collectivism. For masculinity-femininity (MAS), a higher score indicated masculinity, whereas a lower score indicated femininity. And for uncertainty avoidance (UAI), a higher score signaled high uncertainty avoidance, whereas a lower score signaled low uncertainty avoidance.

**Structural model**

As the size of the sample is not only very large, but also includes the entire population of JPC’s workforce outside Japan, it can be assumed that the population is normally distributed and thus a multiple regression analysis can be performed between the selected independent and dependent variables (Elliott and Woodward, 2007).

A multiple regression analysis was first performed with the four organizational characteristics as independent variables and the four steps of knowledge management as dependent variables. The explanatory power of the structural model (Figure 1) was evaluated based on the amount of variance in the dependent constructs (knowledge acquisition, storage, diffusion, and application) for which the model could account ($R^2$). The structural model could explain 21 percent of the variance for knowledge acquisition, 10 percent for knowledge storage, and 29 percent for knowledge diffusion ($p < 0.001$). These exceeded 10 percent, which was proposed by Falk and Miller (1992) as indication of substantive explanatory power. However, the model could only account for 5 percent of the

**Table I** Questionnaire items for assessing knowledge management

<table>
<thead>
<tr>
<th>Items</th>
<th>Individual KM (KMi)</th>
<th>Group KM (KMg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge acquisition</td>
<td>ACQg. Educational opportunities are made available through courses, conferences and on-the-job training</td>
<td></td>
</tr>
<tr>
<td>Knowledge storage/sharing</td>
<td>STOi. You collect information necessary for your work yourself</td>
<td>STOg. Readily usable in-company databases make a big contribution</td>
</tr>
<tr>
<td>Knowledge diffusion</td>
<td>DIFg. You interact with others from different departments to collect first-hand information and clarify issues</td>
<td>DIFg. Information obtained by individuals is voluntarily made accessible to others in the company</td>
</tr>
<tr>
<td>Knowledge application</td>
<td>APPg. New ideas emerge when old ideas are rejected</td>
<td></td>
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**Table II** Questionnaire items for assessing organizational characteristics

<table>
<thead>
<tr>
<th>Items</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure (STR)</td>
<td>You have opportunities to discuss results and formulate new goals with your superiors</td>
</tr>
<tr>
<td>Membership (MEM)</td>
<td>There is a family-like atmosphere</td>
</tr>
<tr>
<td>Relationship (REL)</td>
<td>Emphasis is placed on creation and maintenance of harmonious relationships</td>
</tr>
<tr>
<td>Strategy (STY)</td>
<td>Existing processes and viewpoints are frequently reexamined</td>
</tr>
</tbody>
</table>
variance for knowledge application ($p < 0.001$). Each hypothesis corresponded to a path in the structural model. Thus, support for each hypothesis could be determined by examining the sign (positive or negative) and statistical significance for its corresponding path. The absolute value of the beta coefficient ($\beta$) indicates which of the independent variables have a greater effect on the dependent variable in the multiple regression analysis.

In the model, all the standardized coefficients are significant ($p < 0.001$) and structure shows the strongest (positive) effect on knowledge acquisition, membership and relationship the strongest (positive) effects on knowledge storage, relationship the strongest (positive) effect on knowledge diffusion, and strategy the strongest (positive) effect on knowledge application (Table III). These results are consistent with Magnier-Watanabe and Senoo (2008)'s findings. The only difference is that, in addition to membership, relationship was found to also be a predictor of knowledge storage. Also, even though the model could only account for 5 percent of the variance for knowledge application, it is still highly significant ($p < 0.001$). Therefore, the structural model supports $H1a$, $H1b$, $H1c$, and $H1d$, where organizational characteristics exert a significant influence on knowledge management.

Another multiple regression analysis was then performed with the four dimensions of national culture (Hofstede, 1980) as independent variables and the four steps of knowledge management as dependent variables. In order to verify $H2a$, $H2c$, and $H2d$, the questions on knowledge acquisition, diffusion, and application were reverse-coded. Consequently, betas with positive signs in the structural model would show support for the four hypotheses on the influence of national culture on knowledge management. The structural model (Figure 1)

<table>
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<th>Table III</th>
<th>Regression coefficients for the influence of organizational characteristics on KM</th>
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<tbody>
<tr>
<td></td>
<td>Dependent variable: ACQ</td>
</tr>
<tr>
<td>Organizational Characteristics</td>
<td>Knowledge Management</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td><strong>SE B</strong></td>
</tr>
<tr>
<td>STR 0.405</td>
<td>0.027</td>
</tr>
<tr>
<td>MEM 0.050</td>
<td>0.027</td>
</tr>
<tr>
<td>REL 0.117</td>
<td>0.033</td>
</tr>
<tr>
<td>STY 0.130</td>
<td>0.030</td>
</tr>
<tr>
<td>$R^2$ 0.214</td>
<td>0.100</td>
</tr>
<tr>
<td>Note: <strong>$p &lt; 0.001$</strong></td>
<td>Note: <strong>$p &lt; 0.001$</strong></td>
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</tbody>
</table>
could explain 12 percent of the variance for knowledge storage (\(p < 0.001\)). However, the model could only account for 5 percent of the variance for knowledge acquisition (\(p < 0.001\)), 0.5 percent for knowledge diffusion (\(p < 0.05\)), and 7 percent for knowledge application (\(p < 0.001\)). In the model, all the standardized coefficients are either significant (\(p < 0.05\)), or highly significant (\(p < 0.001\)) and power distance shows the strongest (positive) effect on knowledge acquisition, individualism-collectivism the strongest (positive) effect on knowledge storage, masculinity-femininity the strongest (positive) effect on knowledge diffusion, and uncertainty avoidance the strongest (positive) effect on knowledge application (Table IV). As a result, the four hypotheses \(H2a, H2b, H2c,\) and \(H2d\) are supported, where national culture exerts a significant influence on knowledge management.

Since the hypotheses on the influence of organizational characteristics and national culture on knowledge management were supported, an additional multiple regression analysis is required to assess which predictor has the strongest effect on the dependent variables based on the strength of the beta coefficient (not shown). The absolute value of the beta coefficient indicates which of the independent variables have a greater effect on the dependent variable in the multiple regression analysis. In the model, all the standardized coefficients are either significant (\(p < 0.01\)) or highly significant (\(p < 0.001\)), with the exception of the beta coefficient for the influence of masculinity-femininity on knowledge diffusion which is found to not be significant. Nevertheless, in every instance, organizational characteristics, relative to national culture, shows the strongest (positive) effect on knowledge management.

**Discussion**

**Organizational characteristics and knowledge management**

The relationship between organizational characteristics and knowledge management provides useful insights for multinational companies or domestic firms going overseas. A firm reororganizes as it internationalizes to accommodate new strategies and its structure typically continues to change over time with growth and with increasing levels of investment or diversity and as a result of the types of entry strategy chosen (Deresky, 2008). In turn, the firm may also have to adapt its knowledge management systems and policies since a misfit between organizational characteristics and KM may hinder the productivity of knowledge. However, it is important to note that while organizational characteristics were found to be significantly strong predictors of both knowledge acquisition and knowledge diffusion (accounting in each case for more than 20 percent of the variance), the influence on knowledge storage and knowledge application (although significant) was deemed mild and weak respectively. This finding suggests that organizational characteristics do not equally impact the management of knowledge and that other factors beyond those included here may have to be investigated. For instance, knowledge storage may depend on the tools and the related training available to knowledge workers to effectively share knowledge.

<table>
<thead>
<tr>
<th>Table IV</th>
<th>Regression coefficients for the influence of national culture on KM</th>
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<tbody>
<tr>
<td><strong>Dependent variable:</strong></td>
<td>ACQ</td>
</tr>
<tr>
<td></td>
<td>(B)</td>
</tr>
<tr>
<td>PDI</td>
<td>0.010</td>
</tr>
<tr>
<td>IDV</td>
<td>0.000</td>
</tr>
<tr>
<td>MAS</td>
<td>-0.003</td>
</tr>
<tr>
<td>UAI</td>
<td>0.009</td>
</tr>
<tr>
<td><strong>(R^2)</strong></td>
<td>0.051</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>(<em>p &lt; 0.05; *</em>p &lt; 0.001)</td>
</tr>
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</table>
Knowledge application may be related to the duties of employees, whether requiring more information-processing assignments or knowledge-creation activities.

**National culture and knowledge management**

The quantitative analysis showed that national culture has a significant influence on knowledge management. However, it is important to note that although significant, the explanatory power of national culture on knowledge management is substantial only in the effect of individualism-collectivism on knowledge storage. And the linear relationship that is established for predicting knowledge management based on cultural dimensions only applies to the range of cultural dimension scores used in developing the regression line. Since the scores of power distance, individualism, masculinity, and uncertainty avoidance range between 35 and 104, 14 and 91, 34 and 66, and 8 and 86 respectively, the data provides a broad enough spectrum to draw general conclusions about other countries not included in the current sample.

The influence of national culture on KM implies that the management of knowledge may not only depend on the organizational characteristics of the firm and its deliberate and explicit procedures and guidelines, but may also be constrained by the mental models of its practitioners drawn from national culture. This provides further support for the tailoring of KM not only according to the organizational characteristics of each office, but also based on the country in which it operates. Still, even though national culture was shown to be a significant predictor of knowledge management, organizational characteristics displayed a stronger influence on the management of knowledge.

**Integrated framework**

As Weick (1979, p. 88) noted previously, there is host of influencing factors lying beyond the boundary of the firm: “The word organization is a noun, and it is also a myth. [...] Just as the skin is a misleading boundary for marking off where a person ends and the environment starts, so are the walls of an organization. Events inside organizations and organisms are locked into causal circuits that extend beyond these artificial boundaries”. Knowledge management can no longer be solely attributed to specific KM policies, but should take into account internal factors such as the influence of the organizational arrangement of the firm and external factors such as the effect of national culture. In light of the evidence uncovered in this research, the following framework integrates the two lines of inquiry explored in this research (Figure 2).

**Conclusion**

Knowledge management has long been considered from the onset in the firm’s business strategy and has been shown to have a positive effect on innovation. However, other factors beyond the deliberate initiatives taken by the firm also affect knowledge management. Globalization for instance requires that multinationals consider the perceptions and behaviors of local staff in the management of knowledge. Existing research has promoted knowledge to the status of valuable strategic asset and demonstrated the benefits of a strong link of its management with organizational characteristics. Furthermore, some recent developments...
studies have highlighted the importance of national culture in decision-making styles and thus in the tailoring of knowledge management systems as well.

This framework linking organizational characteristics and national culture to knowledge management had received a first justification using a case-study approach with a qualitative comparative method (Magnier-Watanabe and Senoo, 2008) and has now been confirmed with a quantitative approach. Among the predictors of knowledge management beyond the realm of deliberate measures within the firm, the data shows organizational characteristics to exert a stronger influence than national culture. Hence, changes in organizational characteristics such as structure and relationship in particular, rather than adjustments in the composition of employees’ nationalities, will have a stronger impact on the resulting management of knowledge. Furthermore, because the nature of relationships (systematic or ad hoc) among workers can be attributed to the type of organizational structure (vertical or horizontal), practitioners should focus on structure, which appears as a worthy starting point to positively affect knowledge management.

One limitation to this research lies in the selection of organizational characteristics since other researchers could identify other factors in the firm's organization affecting the management of knowledge. In addition, as this paper centered on a single company in the pharmaceutical industry, future research will attempt to confirm the validity of this framework in other industries.

References


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