How to develop knowledge culture in organizations? A multiple case study of large distributed organizations

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Abstract

Purpose – This paper seeks to identify various factors affecting knowledge culture in some of the large organizations and suggest realistic strategies for developing knowledge culture.

Design/methodology/approach – In-depth case studies were conducted at six large distributed organizations to investigate and assess knowledge management (KM) practices and associated organizational culture. The core data collection is based on semi-structured interviews with senior managers who play a significant role in KM programs at their respective organizations. A range of internal documents of these organizations has also provided some important inputs for the empirical analysis.

Findings – The study identified ten major factors affecting knowledge culture in organizations. These include leadership, organizational structure, and evangelization, communities of practice, reward systems, time allocation, business processes, recruitment, infrastructure and physical attributes.

Research limitations/implications – Perhaps, the major limitation of this research study is associated with the sample selection. All of the companies participated in this research project, were large-scale distributed organizations. Therefore, the findings may not be applicable for small and medium-sized enterprises (SMEs). Furthermore, the derived conclusions would be more assertive if they were tested as hypothetical propositions through a consecutive research survey.

Practical implications – This study provides illustrations and rationale for a diverse range of factors influencing the knowledge culture. Some of the findings deviated from established notions in contemporary KM literature, especially in the issues such as organizational structure, leadership and reward systems. The organizational dimensions explored in this study provide some original thoughts for building sustainable knowledge cultures.

Originality/value – The factors described in this paper are based on the existing KM practices at organizations with well-established KM programs. These can serve as pragmatic guidelines for KM practitioners in developing knowledge culture.

Keywords Knowledge management, Organizational culture, Large enterprises

Paper type Research paper

Introduction

The emergence of the knowledge economy necessitated many organizations to recognize knowledge as a crucial resource to achieve sustainable competitive advantage (Davenport and Prusak, 2000; Drucker, 1988; Hertog and Huizenga, 2000; Skyrme, 1999; Teece, 1998). This recognition resulted in imparting strategic importance to the knowledge management (KM) and triggered the commencement of formal KM programs in many organizations. In the last few years, several theories have been put forward for practicing KM. However, given the abstract nature of the subject area, there is little consensus on the components and ways of knowledge management. Davenport and Prusak (2000) suggest that organizations should take a hard look at their culture before launching a knowledge initiative. Several other authors support this notion and advocate that organizational culture should be the focal point of KM programs (Bock, 1999; Krogh et al., 2000; Nonaka and Takeuchi, 1995; Rastogi, 2000). Despite this widespread recognition of organizational culture as a core factor in the

KM arena, very little is known about creating an effective culture for knowledge management. Many unanswered questions remain regarding the meaning and content of organizational culture itself (Gupta and Govindarajan, 2000; DeLong and Fahey, 2000; Louis, 1983; Martin and Siehl, 1983). Pacanowsky and O'Donnell-Trujillo (1983) argued that, ''organizational culture is not just another piece of the puzzle, it is the puzzle. From our point-of-view, a culture is not something an organization has; a culture is something an organization is''. The problem of defining culture is not new and arises from age-old arguments in anthropology, sociology and archaeology. Given the backdrop of continuing deliberations over the definition of culture, addressing the cultural factors towards effective knowledge management, becomes a complex problem for organizations.

However, some organizations have proved more successful than others have, in their KM efforts, often citing their inherent culture as the central aspect behind their success (Hackett, 2000). Thus, the goal of this paper is to contribute to the understanding of the KM subject area, by exploring and describing various organizational factors that determine knowledge culture. This paper commences with a discussion about culture and knowledge management, to devise a broad set of research questions to explore the factors affecting the knowledge culture in organizations. The discussion and formulation of the research questions was based on a review of literature in organizational behavior, human resource management, information systems, business process management and knowledge management. Second, the paper presents the research methodology and design adopted for this study to address the specified research questions. Third, the findings of this study are analyzed, discussed and evaluated with the insights gained from the existing KM literature. The concluding section of the paper presents the implications of the findings of this study on KM research and practice. The section also discusses the limitations of this study and provides some directions for further research.

Culture and knowledge management

Organizational culture

Tyler (1871) was first to provide a formal description of the term ''culture''. He defined the term as:

> . . . That complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.

This definition emphasizes individuals, knowledge, groups and society as integral constituents of a culture. Several other definitions and descriptions of culture followed in anthropology, sociology and archaeology. In their classic study, Kroeber and Kluckhohn (1952) found 164 different definitions of culture in the anthropological and sociological literature. Though closely related, these definitions present an array of meanings. The key definitional features include the group or the collectiveness, a way of life, and the learned behaviors, values, knowledge and perceptions of the people. These themes give us certain direction and indication regarding the fundamentals of organizational culture.

Steven (1989) notes that the organizational culture is something akin to the culture of the society in which the organization operates. This view considers the organizational culture as a micro culture within the culture of a given society or nation. However, today's large

organizations distributed across the world have developed their own specific cultures embedding various cultural features of the societies and nations in which they operate. These organizations continuously strive to develop their own and unique cultures with a sense of unanimity throughout their distributed divisions. Lemken *et al.* (2000), describe organizational culture as the sum of shared philosophies, assumptions, values, expectations, attitudes, and norms that bind the organization together. These cultural features of an organization may deviate from cultures of their respective societies. Authors take this view of uniqueness of organizational culture rather than treating it as a part of a given societal culture. This view helps us in the context of knowledge management, as many business organizations at large, influence the cultural factors within them rather than the society as a whole.

Knowledge culture

The existing literature in knowledge management constantly accentuates the inseparable relationship between organizational culture and knowledge management (Davenport and Prusak, 2000; Krogh *et al.*, 2000; Nonaka and Takeuchi, 1995). Despite this emphasis on the crucial role of organizational culture in knowledge management, there is a lack of clarity on how to influence and develop knowledge culture in organizations. Authors refer to the knowledge culture in this paper to represent:

> A way of organizational life that enables and motivates people to create, share and utilize knowledge for the benefit and enduring success of the organization.

In KM literature, a wide array of factors and concepts are cited as influencing elements for the creation and development of knowledge culture. These include organizational structure, people, rewarding systems, leadership, business processes and information systems (Drucker, 1999; DeLong and Fahey, 2000; Gupta and Govindarajan, 2000; Wenger *et al.*, 2002). However, there are limited descriptions about how various individual elements influence knowledge culture. Moreover, certain literature in the subject tends to orient the KM programs, theories and frameworks towards a particular track or an organizational element. These tracks include, process orientation, people orientation and technology orientation (Lewis, 2002; Natarajan and Shekhar, 2000; Nissen *et al.*, 2000; Remus and Schub, 2003). As the development of a knowledge culture needs consideration of multiple organizational elements, such orientation mystifies the KM practitioners. There is also a dearth of empirical evidence about how various organizational factors can be managed for developing the knowledge culture. For instance, it is difficult to find proven concepts and theories in the current literature demonstrating effective organizational structures for KM.

Research questions

Based on a literature review, three major questions were derived to address the empirical inadequacies regarding the development of knowledge culture. The following are the three meta-level research questions formulated for this study to identify and describe the factors influencing the knowledge culture in organizations:

1. What are the factors that enable knowledge culture in organizations?

2. How do various cultural factors influence knowledge management in organizations?

3. What strategies, initiatives and measures organizations should take to create and develop knowledge culture?

Several organizational factors, listed in Table I, were considered to guide this research study. These factors were taken on a hypothetical basis during the research study that was designed to be both explorative and descriptive. Contradicting the prominent view in KM literature, authors have not taken the ''people'' element as a distinct factor during the study. Discussing the ''people'' element as a discrete subject within the organizational culture gives rise to a logical confusion to the theorists and practitioners. Culture is normally defined by anthropologists in such a way that, even if ''human'' is not explicitly specified, the possibility of any non-human possessing culture is made impossible in practice (Kroeber and Kluckhohn, 1952; Pacanowsky and O'Donnell-Trujillo, 1983). Therefore, in the subject of

Table I Organizational issues (affecting knowledge culture) considered in the study		
Agility in organizations	Innovation	Organizational functions
Business process management	Intranet	Organizational structure
Change management	KM evangelization	Performance appraisal
Collaboration	KM events	Physical work environment
Communities of practice (CoPs)	KM infrastructure	Pilot projects
Competitiveness	KM jobs and roles	Problem solving
Customer orientation	Knowledge maps	Professional development
Decision making	KM organizational structure	Recognition
Empowerment	KM projects	Recruitment
Enterprise information portal	Knowledge work	Resource allocation
Expert systems	Knowledge worker	Reward systems
Extranet	Lay-offs	Risk taking
Flexibility	Leadership	Search engines
Front-end managers	Learning	Senior management
Group motivations	Long-term vision	Short-term focus
Groupware	Loyalty	Sponsorship
Human resource management	Market orientation	Team behavior
Incentives	Middle level managers	Team leaders
Individual behavior	Neural networks	Tolerance to failures
Individual motivations	Openness to change	Training and development
Informal employee relationships	Openness to experimentation	Trust building

knowledge culture, the people or employees of an organization are the subject. In this context, the aspects such as, organizational structure (of people), reward strategies (for people), leadership (by people), trust (in people) and infrastructure (for people) may be discussed as disparate factors influencing knowledge culture. The authors adopt this people-centric approach for achieving clarity and precision in studying the role of organizational culture in KM.

Research methodology and design

Case study method

Many researchers in social sciences argue that only certain dimensions of culture may be studied using quantitative research methods. They propose that the assessment of cultural factors require thorough investigation, which include, learning about the history of an organization, visiting the place, talking to the employees and observing their behavior (Rousseau, 1990; Schein, 1999). Qualitative research methods such as case studies, ethnography and action research provide many avenues to learn about these aspects. The case study approach, in specific, is often used and suggested in conditions where several elements and multiple dimensions of a subject need to be studied exhaustively (Alavi and Carlson, 1992; Benbasat *et al.*, 1987; Eisenhardt, 1989; Yin, 2002). As it can be observed from the formulated research questions, the multiple dimensions of organizational factors are to be studied and analyzed in this research study. The crucial factors affecting knowledge culture need to be explored and their rationale described. Therefore, the case study approach has been chosen to address the derived research questions. Yin (2002) defines case study method as:

> An empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

The perplexity in the relationship between the organizational factors and knowledge culture illustrates the appropriateness of case study enquiry in this research project. The case study methodology also supports the explorative and descriptive nature of this study. Other qualitative methods such as ethnography and action research were not considered practical for this study because of the constraints such as time span, organizational access and other resources.

An effective understanding of the critical cultural phenomenon depends on choosing appropriate cases (Stake, 2000; Miles and Huberman, 1994). The case organizations for this empirical study were selected through a purposive sampling. The intention was to achieve a fine diversity of responses and to qualify the collected data for generalization of the observed phenomena. In purposive sampling, researchers need to select the units for research, based on characteristics or attributes that are important to the evaluation (Smith, 1983; Patton, 1990; Yin, 2002). A mixed sample of six large organizations were chosen for this study, on the basis of several characteristics including the size, industry sector, operational distribution, knowledge intensity and the maturity of KM practices. Five of the organizations are globally distributed businesses while one organization is a UK National Health Service provider. Most of these organizations have definitive knowledge management strategies and implementation programs. To achieve a rich mixture of responses, interviews were conducted in distinctive geographical locations and industry segments. Details of the organizations and interview locations are provided in Table II. KM programs at many of these organizations have been widely acknowledged and some have won most admired knowledge enterprise (MAKE) awards over the last few years: HP in 2004 (Teleos, 2004) and Wipro in 2003 (Teleos, 2003). These base factors in case selection have strengthened the evidence by giving an opportunity to identify and generalize the factors influencing knowledge culture.

Data collection

The core method of data collection was based on a semi-structured interview instrument developed through a literature review. Interview method was preferred in this project to achieve our objective of exploring various factors influencing knowledge culture in organizations. Silverman (1985) notes that the interview data display cultural realities, which are neither biased nor accurate, but simply ''real''. Kvale (1996) also advocates the interview method to seek and describe the meanings of central themes, in the life world of the subjects such as organizational culture. The questionnaire was designed to allow respondents to drive and describe the content within the boundaries of formulated meta-level questions. The interviewees were predominantly the directors, senior managers, knowledge managers and functional heads, who played a significant role in the development and implementation of KM strategies in their respective organizations. In each of the organizations, up to three managers were interviewed to get a varied and comprehensive account of organizational culture and KM practice. The time span of each interview ranged from three to eight hours, and in some cases was spread across two weeks to suit the busy schedules of the respondents. All interviews were conducted at the respective organizations and were recorded with prior permission of the respondents. To provide a thorough analysis, the

Table II	Details of case organizations			
Organization	*Location of research study*	*Total no. of employees*	*Distribution of operations*	*Industry*
Oracle Corporation	Oracle EMEA, London, UK	41,000	100 countries	Software products and services
National Health Service (NHS)	Manchester Royal Infirmary, UK	1,300,000	Multiple locations in UK	Health services
Hewlett Packard (HP)	e-Business division, Bangalore, India	140, 000	178 countries	IT hardware products and services
Wipro Technologies	Global Head Quarters, Bangalore, India	41,000	35 countries	Software products and services
Alcatel	Alcatel SEL, Stuttgart, Germany	151,000	130 countries	Telecom products and services
Daimler Chrysler	Global Head Quarters, Stuttgart, Germany	384,000	200 countries	Automobile

authors have studied various internal KM strategy and practice documents of the case organizations. These included best practice documents, white papers, customer case studies, internal journals, presentations and previous research papers. The authors have also explored the intranets, extranets and technology components of the organizations under study, to analyze the KM infrastructure and their usage patterns. During and after each interview, notes were made to describe important observations that are relevant to the research questions.

Data analysis

The data collected through the interviews and additional documents were examined to remove incomplete and ambiguous information. A thorough review of interview records and a series of post-interview communications with the respondents helped the authors in achieving data accuracy. The content is analyzed through a series of readings and specific codes were assigned to the pieces of text that represented important concepts and distinct responses from the interviewees. Two researchers have independently analyzed the data to avoid bias and ambiguity. As suggested by Miles and Huberman (1994), the data are conceptualized through a mapping process whereby themes are identified, appropriately weighted, and then related. The concepts formed through this process were categorized and analyzed for common patterns between the organizations explored in this study. The extracted patterns are presented as a range of factors shaping knowledge culture in organizations. The following five qualifying criteria have been adopted during the data analysis stage to determine each of the factors. The factors meeting these criteria are presented with selective examples of data to support the arguments and conclusions:

1. Each factor should be mentioned and supported by multiple respondents from two or more of the organizations under study.

2. Each factor should have played significant role in shaping the knowledge culture in two or more of the organizations under study.

3. Respondents should have provided instances of how a particular factor has influenced the knowledge culture in their respective organization and the way it has been managed.

4. Each factor should be clearly identified by two or more researchers during the discrete analysis of the gathered data.

5. The interview data supporting each factor should be eligible for triangulation with the verifiable data from internal documents of the respective organizations.

Ethics

The details of the respondents and their organizations were deliberately separated from the analysis and conclusions presented in this paper, because of the ethical issues and the privacy agreements charted for this research project. Stake (2000) advocates this research practice and asserts that the value of the best research is not likely to outweigh injury to a person exposed. He says:

> Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict.

Findings, discussion and evaluation

Based on the empirical analysis, ten factors (F1 to F10) have been derived that have influenced the development of knowledge culture in the organizations under study. Although many of these factors are interrelated, they are still deliberated as discrete factors because of their individual importance and manageability characteristics. The following sections describe each of these factors in detail with substantiating illustrations. The derived factors and the associated study findings are evaluated with the pertinent theories in the existing KM literature.

F1 Leadership

Many respondents believed that the expression of positive leadership characteristics at various levels of management is a vital aspect for developing knowledge culture in organizations. These attributes include, empowering subordinates, allocation of resources, openness towards change and experimentation, developing trust, tolerance to mistakes and building long-term perspective of the organizational goals among employees. They have emphasized that empowering employees with certain autonomy in task achievement and learning, can provide agility to the organizations knowledge culture. However, extant literature often emphasize chief executive officers and senior directors in the context of the leadership and development of organizational culture (Ribiere and Sitar, 2003; Bixler, 2002; Bonner, 2000; Ellis and Rumizen, 2002; Schein, 1996). Conversely, many interviewees expressed that, while leadership from senior management is important, it is essential that middle and front-end managers demonstrate these leadership attributes to develop and support knowledge culture throughout the organization. This study revealed that the middle and front-end managers determine the success of KM programs and development of knowledge culture in a given team or division. At some of the organizations under study, despite good support from senior management, KM programs have not succeeded in certain divisions due to the lack of support from managers at lower levels of the organizational hierarchy. Whilst in some others, a few divisional managers initiated KM programs and created knowledge culture in their respective teams, with little support from the senior management. This study highlights the essential role of middle and front level managers in developing knowledge culture through the manifestation of various leadership characteristics. The findings correlate with the view that effective management and leadership are integral to each other and leadership at all managerial levels is required to develop a desired culture (Kluge *et al.*, 2001; Marsh and Satyadas, 2003; Welch and Welch, 2005).

F2 Organizational structure

The majority of the respondents viewed that the conventional organizational structures need to be transformed to support the development of a knowledge culture. Previous studies in this area have proposed the creation of several exclusive KM jobs, which include, chief knowledge officer (CKO), knowledge managers, portal managers, content managers and knowledge analysts (Davenport and Prusak, 2000; Gordon, 2002; Gray, 1998; Rastogi, 2000; Rumizen, 2002; Skyrme, 1999). This study confirms the view that some specialist positions such as KM analysts and coordinators are necessary for developing knowledge culture. People with expertise in the areas of strategic management, process analysis and reengineering, change management, content development, human resource management and knowledge portal development, are considered crucial in instituting a knowledge culture at the organizations explored in this study.

However, a significant number of the respondents were critical about establishing a comprehensive hierarchy for KM and suggested to create KM roles, as opposed to the KM jobs. Some of the organizations under study have KM positions with substantial functional role attached to their job profile. A very few exclusive KM jobs are created which include knowledge analysts, content editors and knowledge portal administrators. In two of the organizations under study, the number of exclusive KM jobs has been reduced over the years albeit the continuous growth in the overall employee numbers. One organization, in particular, has a strategy to avoid the exclusive KM jobs at senior or middle managerial

> **" Senior management should be actively involved in the evangelization process and convey that knowledge creation and sharing is highly valued in the organization. "**

levels. In these organizations, either the functional roles were attached to KM jobs or the KM roles were embedded in the jobs of core functional areas such as sales, product development, manufacturing and customer service. Within each functional division, people with positive attitudes and skills towards knowledge management were awarded with KM responsibilities of their respective functional division. KM education, training and expertise are provided to these people to promote knowledge culture. Some respondents expressed that the large number of exclusive KM jobs are not sustainable, as they often become vulnerable positions during the lay-offs.

Figure 1 depicts a common theme of organizational structures observed during this study, with some positions consisting both the core functions and knowledge management responsibilities. In three of the cases, these mixed positions with varying degrees of KM and functional roles were observed. Depending on the requirement and extent of KM tasks, a given functional position was embedded with KM roles consuming up to 30 to 60 percent of overall job time. A KM job title such as ''knowledge manager'' is given if the job has more KM tasks. Conversely, a title such as ''customer relations manager'' is given if the job is predominantly functional. The authors name these mixed organizational job structures as ''hybrid KM structures'' or ''hybrid organizational structures''. These structures have been successful in developing knowledge culture and integrating KM activities with the core business functions at the organizations explored in this study. The structures are considered sustainable because the people in KM positions are also involved in core business activities. Moreover, each functional division undertakes a part of overall KM costs, by paying their functional jobs with embedded KM roles. The hybrid structures also enable the integration of KM programs with functional divisions, as the people with the hybrid roles predominantly get involved in KM activities concerning their functional division. This study demonstrates that it is a key way to make KM everybody's business and spread the knowledge culture throughout the organization.

F3 Evangelization

Evangelization of the value of KM activities to the employees, has been a significant aspect of KM programs in the organizations under study. Respondents suggested that the KM programs should consistently inform the employees about how KM can improve their performance and mutually benefit the organization. Senior management should be actively

Figure 1 A thematic representation of hybrid organizational structure for KM
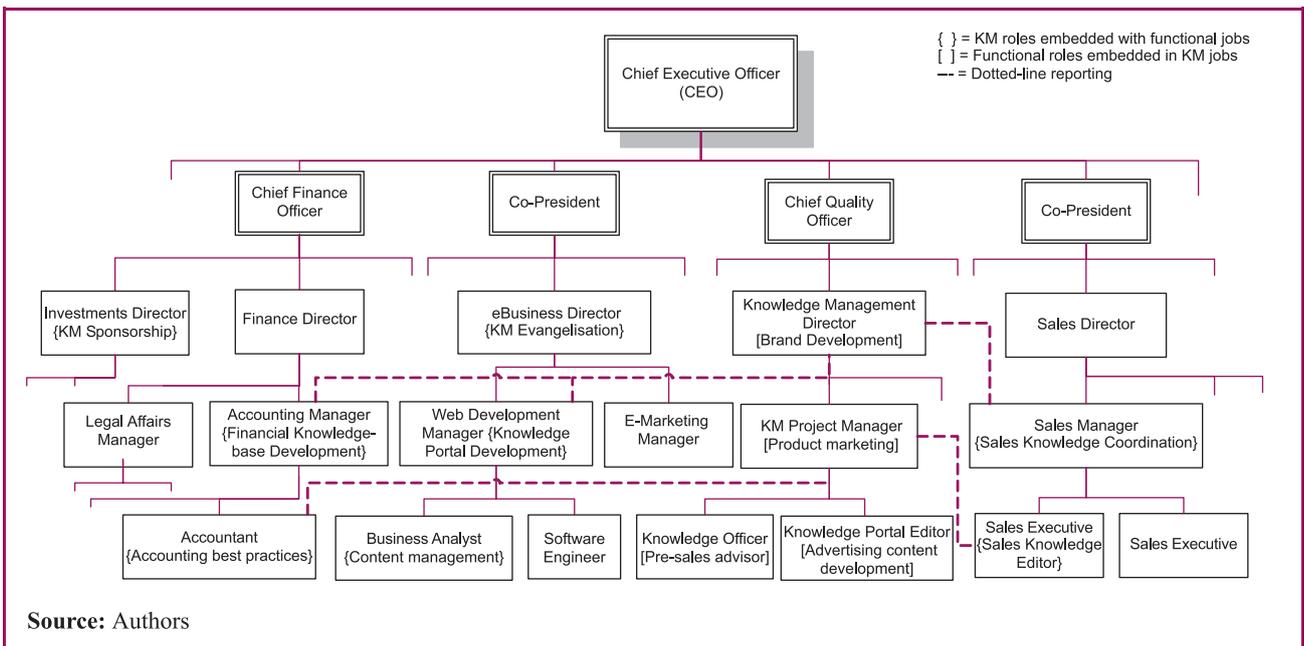
Source: Authors

involved in the evangelization process and convey that knowledge creation and sharing is highly valued in the organization. Otherwise it can be considered as a minor issue and may not be given due diligence by middle and front-end managers. KM evangelization also covered the establishment of various communication channels to convey the significance, processes and achievements of KM. Most of the organizations had regular internal magazines, journals and newsletters to spread this information. People who are actively contributing to the organizational knowledge, through communities of practice and other means, are made visible to the whole organization through these channels. Some respondents stated that the business leaders at CEO level were actively involved in the evangelization process by conveying the value of KM programs to the whole organization. They regularly identify and reward the employees who make valuable knowledge contributions to the organization. Other studies at Bristol-Myers Squib Company, and Russell Reynolds Associates (Paul, 2003), indicated a similar view that employee recognition from senior management directly motivates people to participate in KM activities and enhance knowledge culture in organizations.

F4 Communities of practice

Lave and Wenger (1991) coined and described the term, communities of practice (CoPs) as, ''an activity system that includes individuals who are united in action and in the meaning of action has for them and for a larger collective''. The majority of the interviewees believed that the communities of practice have strengthened the knowledge culture in their organizations. The respondents suggested that encouraging the development of CoPs is an effective way to launch knowledge management programs. In the organizations understudy, CoPs are evidently playing a significant role in resolving product issues, solving customer problems and assisting in the generation of sales. Formal and informal CoPs were observed in all of the organizations, overlapping various functional divisions and often deviating from the managerial hierarchies. Formal CoPs were generally based on projects while the informal ones were based on subject expertise, skill set and professional competencies. Many of these communities surpassed organizational boundaries with active members from across the globe. However, there is a widespread view among the respondents that the major role of the organizations, in developing CoPs, lies in providing necessary communication infrastructure such as knowledge portals. The communities should be provided with facilities for virtual interaction and content management. Occasionally, some CoPs may need financial resources and time for possible physical conferences and meetings between the members. Two of the organizations under study, regularly sponsor such events for the members of CoPs. However, in one specific case, the members of a well-established professional community preferred to be unknown to the organization, fearing that their managers would consider this as a time-consuming issue effecting target achievements. This particular instance resonate with a common theme in KM literature that formal management efforts can hinder the development of CoPs (Preece, 2000; Stamps, 1997; Wenger *et al.*, 2002).

The majority of the respondents inclined towards leaving the CoPs as self-governing entities. However, in some of the organizations, formalization of CoPs was taken aboard when there was a specific business opportunity and request from a given community. For instance when the activities of a given community has the potential for a new product or service development, then a formal work group or project team is created by allocating the needed organizational resources. Facilitating and promoting CoPs was seen as an important element of KM programs in many of the organizations explored in this study. The senior managers regularly recognized and valued the employee participation in CoPs, wherever such participation has resulted in visible organizational benefits. Interviewees expressed that such organizational attention, support and sponsorship for CoPs directly promote the knowledge culture.

F5 Reward systems

The findings of this study confirm a general view in KM literature (APQC, 2002; Davenport and Prusak, 2000; Gupta and Govindarajan, 2000), that organizational rewards motivate

employees towards knowledge sharing and foster a knowledge culture. However, in the context of knowledge contribution, many interviewees demarcated between direct and indirect rewards. The respondents suggested that the indirect rewards such as appreciation and recognition play a greater role than the monetary incentives. Moreover, in promoting knowledge culture, long-term rewards such as profit sharing and employee share options (ESOPs) were observed as effective means when compared to the short-term incentives. There is also a prevalent view among respondents that irrespective of organizational rewards, some employees may involve in knowledge activities because of the intrinsic drive for learning, personal contentment, peer recognition and self actualization. Recent studies in the subject also confirm that these behavioral motives play a major role in knowledge creation and sharing (Ardichvilli *et al.*, 2003; Darwin, 2004; Malhotra and Galletta, 2003; McLure and Faraj, 2000).

The majority of the respondents experienced difficulties in ascertaining the economic value of knowledge activities of individual employees, to provide them with pertinent incentives. They also emphasized that a qualitative evaluation of employees' knowledge objects is needed while providing rewards. Otherwise, the quantity may dominate over the quality and can jeopardize the reward objectives. Professional groups and academies, consisting of domain experts, were established at three of the organizations under study. These groups appraise the knowledge objects such as, white papers, best practices and innovative ideas developed by the employees. This study also shows that the existing human resource management practices need to be reviewed to recognize the knowledge contributions of employees and to develop knowledge culture in modern organizations. Many respondents suggested making certain enhancements in the performance appraisals, pay reviews, incentive strategies and other long-term career issues. In most of the organizations, the acknowledgement of employee knowledge contributions was informal and depended on the judgment of immediate managers. Whereas, the respondents expressed that this should be a standard and natural part of the performance appraisals. Only two organizations had formal processes in place to appraise knowledge contributions of the employees. In these two cases, the knowledge contribution issues carried up to 20 percent weightage in the overall performance appraisals.

F6 Time allocation

Nearly all the interviewees emphasized that, to develop a knowledge culture, it is essential to allocate time for employee learning, collaborations, knowledge creation and sharing activities. Krogh *et al.* (2000) also reported the importance of time allocation exemplifying 3M and Sencorp, where employees are allotted between 15 to 20 percent of their job time for new knowledge creation. The respondents also suggested that the team leaders and middle managers play a significant role in allocating this crucial organizational resource to individual employees and directly affect the development of knowledge culture. While the senior management can facilitate knowledge culture by developing KM strategies and programs, they may not wholly influence the time allocation for each employee. The respondents have also noted that the expression of a long-term vision by managers is crucial to the development of knowledge culture. ''Time allocation'' was stated as a key factor for the existence of differences in knowledge habits between various teams and divisions with in a given organization. They have reported that it is common to find managers who concentrate predominantly on achieving short-term goals and targets. These managers may not allow their team to spend time on knowledge creation and sharing, consequently hindering the knowledge culture. Therefore, in many cases, the KM program managers have

chosen particular functional divisions for their pilot projects based on the positive attitudes such as the willingness to allocate time for KM activities. Many respondents also suggested a gradual approach of improvement, whereby the knowledge culture is slowly extended to the whole organization through such pilot projects. Recent studies in the area also indicated limitations in achieving organization-wide knowledge culture in a single instance and suggested the pilot project approach (Paul, 2003; Reinhardt, 2005; Rumizen, 2002).

F7 Business processes

This study demonstrates that the effective management of business processes is an important building block for developing sustainable knowledge culture. Davenport (1998) advocates that knowledge is generated, used, and shared intensively in a few specific processes. These knowledge intensive processes (KIPs) may vary depending on the organization and the industry sector, but generally include, market research, product development, sales and service delivery. They are considered as the core processes along the value chain and primarily use knowledge in order to create process outputs (Eppler *et al.*, 1999; Remus and Schub, 2003). Many respondents asserted that it is essential to integrate KM activities with the core business processes to enable seamless flow of knowledge in the day-to-day business life. This requires continuous analysis and improvement of KIPs to assess and resolve knowledge needs, resources and gaps. These process initiatives standardize and spread KM activities from a few knowledge active teams and divisions to the whole organization (Nissen and Levitt, 2004; Wenger, 2004).

A prevalent strategy in the organizations explored in this study, is to ''capture knowledge when it is generated''. To achieve this agile strategy, the domain expert teams such as special interest groups (SIGs) have been created to capture and reuse dynamic functional knowledge in the KIPs. These groups develop knowledge artifacts such as, templates, guidelines, best practices, case studies, expertise notes, knowledge maps, work flow charts etc., to assist in the effective execution of the KIPs. Some of the organizations under study have made it mandatory to write case study reports, at the time of each sales accomplishment or project closure, to capture the knowledge generated in the processes. The case studies covered many important topics including the customer issues, project problems, trouble shooting, lessons learned, decision rationale and best practices. To ensure quality and usability, the subject experts systematically review the knowledge objects before making them accessible to the wider organization.

In many cases, the KIPs were also optimized to capture vital customer knowledge from various market segments. Literature in the business studies area, emphasize that gaining customer knowledge is a competitive advantage, and advocate to utilize it in product development and service delivery (Drucker, 1999; Gebert *et al.*, 2002; Hammer, 1990; Österle, 2001; Porter and Millar, 1985). This notion is evident in many of the case organizations, which have created industry focus groups to gather and shove market knowledge into product and service development processes. For instance, if an industry group is responsible for the aerospace sector, it is expected to have a deep knowledge of the customer segment and keep track of all the changes occurring in the industry sector. It is the group's responsibility to update its knowledgebase through sales executives, distribution channels, industry reports, newspapers, journal articles etc., and share this knowledge with the core organization to develop, modify and target the products accordingly. However, to accommodate KM activities in the KIPs, many respondents suggested to make incremental process changes rather than complete reengineering. Total process reengineering, for KM, is viewed as a time consuming and complex task that can derail the KM efforts. Therefore, a continuous and incremental approach is favored, whereby the KM activities are gradually planted in the core business processes to institute knowledge culture throughout the organization.

F8 Recruitment

This study illustrated that it is important to consider the knowledge sharing etiquette of the potential employees during the recruitment phase. An organization can regulate its knowledge culture to a certain extent by recruiting employees with a positive attitude
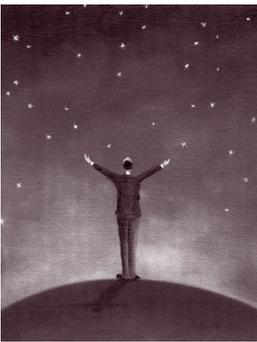
towards knowledge sharing and team dynamics. Hall (2001) also advocates that the employment of intrinsically motivated colleagues might be seen as an issue of recruitment and selection. While a majority of the respondents in this study agreed that this factor is worth considering, only one organization has formalized recruitment practices to analyze the knowledge creation abilities of potential employees. Some of the interviewees expressed that this factor is often compromised, especially when certain skills are at shortage and need immediate fulfillment. However, nearly all the respondents stated that, organizations should consider analyzing the knowledge attitudes of potential employees in well-planned employment ventures such as graduate recruitments. For instance, assessment of past knowledge contributions, knowledge sharing motivations, team behavior and learning patterns can reveal the knowledge etiquette of potential employees. Interviewees expressed that numerous tests are in practice, to know the aptitude of potential employees in areas such as team working and customer orientation, but methods to examine knowledge attitudes are not widely available. This study demonstrates that further research work is needed in this domain to develop some precise methods and theories for knowledge aptitude assessment.

F9 Infrastructure

The majority of the respondents viewed that it is fundamental to establish the information and communication infrastructure to facilitate the knowledge culture. Knowledge portals, in the form of intranets and extranets, are the most common type of infrastructure observed in the organizations explored in this study. Other recent studies (Detlor, 2004; Gottschalk and Khandelwal, 2004; Spies *et al.*, 2005) have also found that knowledge portals play an important role in KM. All of the organizations explored in this study, have been making considerable investments in an array of technologies for providing KM infrastructure. The observed technology components include groupware, search engines, virtual conferencing tools, and data mining technologies, content management systems, decision support systems and artificial intelligence (AI) tools. These technologies were integrated into knowledge portals to provide a single gateway for accessing the organizational knowledge base. Figure 2 depicts the conceptual architecture of knowledge portals observed in this study. Through these portals, people can access, create, organize, share and utilize enterprise knowledge via seamless collaborations. The majority of the respondents asserted that the knowledge portals are an effective way to provide open access to all relevant information to the employees. This organization-wide access can prevent information hoarding and directly enhance knowledge culture. This study has also revealed another evident trend, wherein organizations extend their knowledge base access to the business partners and customers. Though such access is restricted to certain areas, it is playing an important role in collaborative product development, service delivery and project accomplishments.

Very few respondents supported a persistent criticism in KM literature that the technology takes superfluous lead role in KM programs (Malhotra, 2004; Wilson, 2002; Ruggles, 1998). There is a pervasive view among the respondents that technology can significantly promote knowledge culture by changing employee habits in terms of communication, collaboration, information sharing, learning and decision-making. The portal infrastructure can also serve as the essential ''Ba'' component (an interaction platform, a place and context in time-space nexus) of the KM theory developed by Nonaka and Konno (1998). Many respondents asserted that the infrastructure is central for virtual communities and an essential part of all KM programs, making it a crucial factor for developing knowledge culture.

F10 Physical attributes

This study shows that the physical configuration of the work environment also influences the knowledge culture in organizations. Structural characteristics such as, shared areas, cubicles with low dividers, open spaces and other informal meeting amenities can help people in the process of social networking. These physical characteristics can facilitate the flow of knowledge across the organization. Research studies at Alcoa, British Telecom, f/X Networks (Cohen and Prusak, 2001), BP (Chiem, 2001), TBWA CHIAT DAY (Gladwell, 2000)

Figure 2 A conceptual architecture of KM infrastructure

Source: Authors
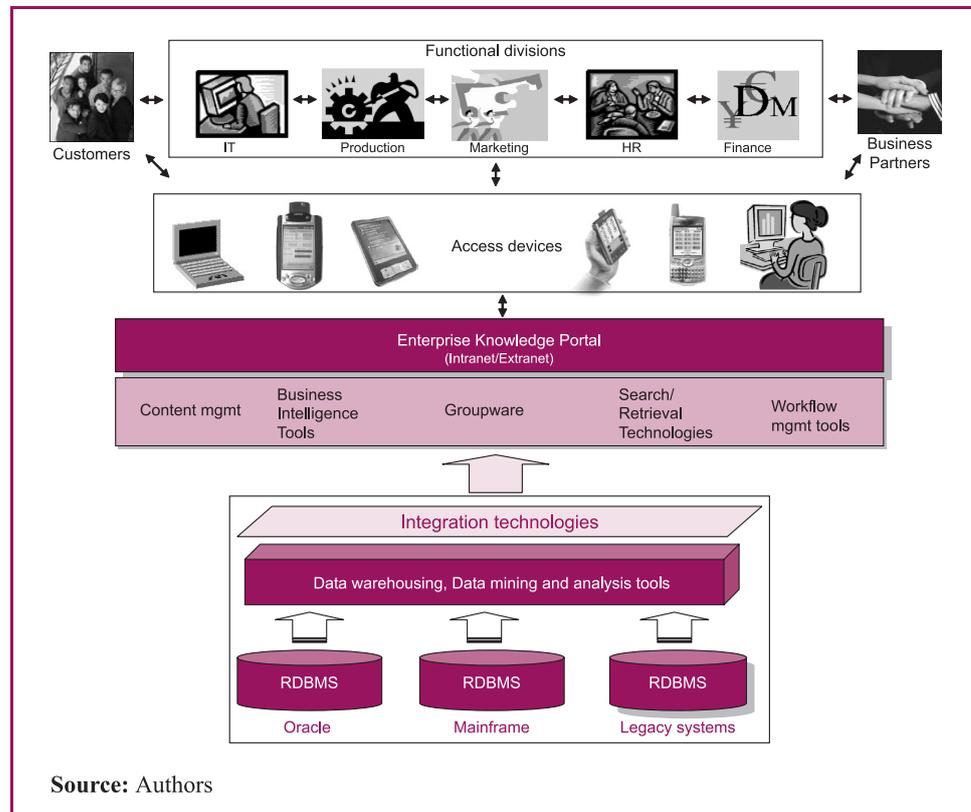
and SAP (Czarnecki, 2001) emphasized the role of physical work environment in employee collaborations and innovation. For example, one of the interviewees of this study has worked at his organization's global head quarters (HQ) for two years as part of the employee development program. The interviewee had experienced phenomenal differences, in physical office environment between the HQ and his divisional office, which directly affected employee collaboration and knowledge sharing. Unlike the divisional office, the HQ has adopted an open door policy and does not have conventional cubicles. The office cabins at the HQ were built using glass walls and doors so that everybody can see whether some one is busy or available to talk. People can walk into any of the offices without a prior appointment. These characteristics have explicitly promoted the development of a culture of openness and knowledge sharing among the employees. When the interviewee returned to his own regional division at the end of the program, he noticed that the physical work environment at his division is rather enclosed which deterred the social networking and flow of knowledge.

In many of the case organizations, authors have observed provision of physical amenities such as discussion rooms, internet café's, common dining halls, open door offices and informal meeting tables. These common shared spaces have contributed to the development of knowledge culture by facilitating informal collaboration between employees. They provide a high probability for interaction between the people from various functional departments and aid in the crisscrossing of organizational knowledge. Positioning the presentation equipment, couches, whiteboards, internet nodes, notepaper and pens in these shared spaces assist and encourage employees to do useful organizational work during the informal gatherings. Based on our observations and the annotations from respondents, it can be asserted that physical structure and design of the work environment play an important role in the development of knowledge culture. Extant literature in social behavior, architecture and knowledge management also suggest that,

organizations should consider these workspace characteristics to promote employee collaboration and knowledge sharing culture (Anderson *et al.*, 2001; Cohen and Prusak, 2001; Chiem, 2001; Girard, 2004; Kolleeny, 2003).

Conclusions

There is a widespread view in KM literature that organizational culture plays a key role in developing knowledge culture. This study has explored, analyzed and presented some major factors affecting the development of knowledge culture in large organizations. Based on an empirical research conducted at six large distributed organizations, this study has identified ten organizational elements influencing the creation and development of knowledge culture. These factors include leadership, organizational structure, evangelization, communities of practice, reward systems, time allocation, business processes, recruitment, infrastructure and physical attributes.

Figure 3 summarizes the study findings while depicting the explored factors as a collective and presents a ten-factor framework for developing knowledge culture. The floral portrait shows each factor with characteristic strategies identified during the study. Nurturing the knowledge culture, positioned at the nucleus, requires effective management of each centripetal factor. The study has evidently emphasized that all these factors should be prudently managed in order to foster an effective knowledge culture. The supporting illustrations and rationale, provided for each of the factors, offer some realistic strategies for the development of knowledge culture. Some findings of this study have deviated from established notions in the contemporary KM literature, especially in the issues related to the organizational structures, leadership, reward systems and other human resource management practices. The organizational dimensions explored in this research, present some original thoughts for developing sustainable knowledge cultures.

The factors described in this paper are based on KM practices at the organizations with well-established KM programs. These can serve as the pragmatic guidelines for the KM practitioners and researchers. Some of the current literature in KM tends to orient towards a

Figure 3 Ten-factor framework for developing knowledge culture in organizations
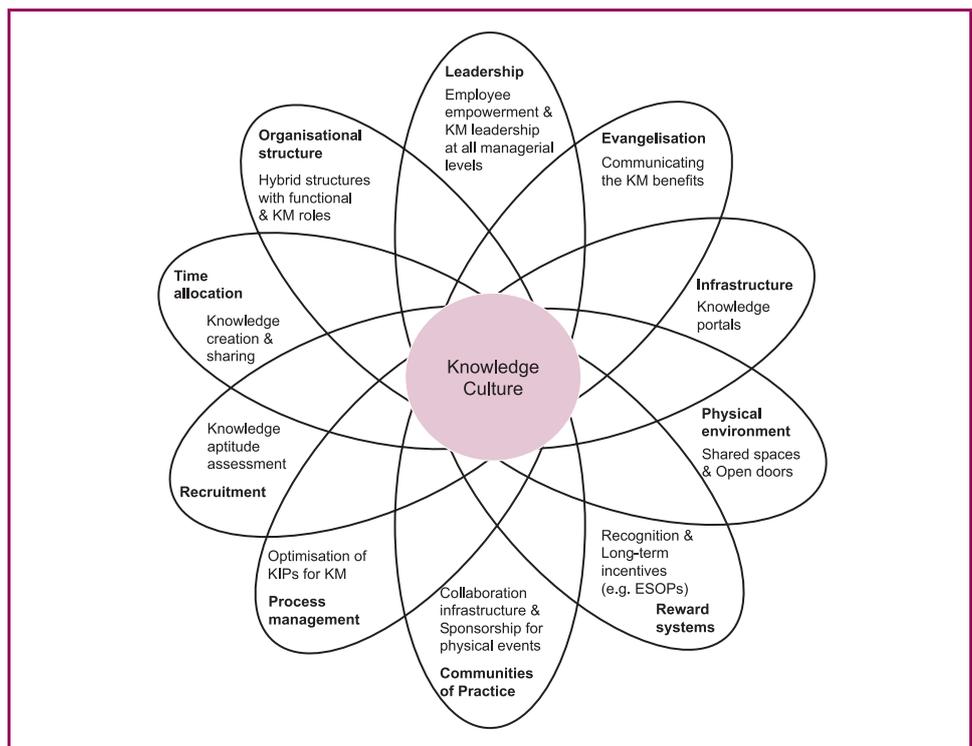
particular track or an organizational element, such as, the process orientation, people orientation and technology orientation. Conversely, this study demonstrates that the KM practitioners need to adopt a composite view (Figure 3) of organizational factors for developing the knowledge culture. Perhaps, the major limitation of this research study is associated with the sample selection strategy. All of the cases in this research study are large-scale distributed organizations with more than 40,000 employees. Therefore, the findings may not be generalized for small and medium-sized enterprises (SMEs). The disassociation of organizational details from various findings presented in this paper may not permit the readers to construct specific assumptions and derivations. However, such a strict code of ethics was needed to preserve the identity of the participants who provided valuable contributions to this research project.

The organizational factors and the correlated characteristics described in this paper may be applied for a universe of large-scale distributed organizations. The rationale of generalization is supported by the diversity of the cases, depth of the interviews and the evaluation criteria adopted for this study. However, the assertiveness and generalizability of some of the explored factors and the derived conclusions maybe improved through a consecutive research survey. The authors intend to further examine the following findings as the hypothetical propositions, *P1-P6*, derived from various aforementioned factors, F1, F2, F5, F6, F8 and F10, respectively:

- *P1.* In the context of knowledge culture, the expression of leadership attributes by the middle and front level managers is equally essential, as it is from the top management.

- *P2.* Hybrid organizational structures are effective in facilitating sustainable knowledge culture.

- *P3.* In the context of employees' contribution of knowledge to the organization, recognition and long-term incentives (e.g. ESOPs) act as better motivators than the short-term monetary incentives.

- *P4.* Time allocation for employee knowledge activities, is a crucial element in developing knowledge culture and a detrimental factor for the success or failure of KM programs.

- *P5.* Analyzing the knowledge etiquette of the potential employees, during the recruitment process, helps the organizations in regulating and developing the knowledge culture.

- *P6.* The structure and design of the physical work environment plays a significant role in knowledge sharing attitudes of employees.

References

Alavi, M. and Carlson, P. (1992), ''A review of MIS research and disciplinary development'', *Journal of Management Information Systems*, Vol. 8 No. 4, pp. 45-62.

Anderson, C.J., Glassman, M., McAfee, R.B. and Pinelli, T. (2001), ''An investigation of factors affecting how engineers and scientists seek information'', *Journal of Engineering and Technology Management*, Vol. 18 No. 2, pp. 131-55.

APQC (2002), *Rewards and Recognition in Knowledge Management*, APQC, Houston, TX.

Ardichvilli, A., Page, V. and Wentling, T. (2003), ''Motivation and barriers to participation in virtual knowledge-sharing communities of practice'', *Journal of Knowledge Management*, Vol. 7 No. 1, pp. 64-77.

Benbasat, I., Goldstein, D.K. and Mead, M. (1987), ''The case research strategy in studies of information systems'', *MIS Quarterly*, Vol. 11 No. 3, pp. 369-86.

Bixler, C.H. (2002), ''Applying the four pillars of knowledge management'', *KMWorld*, Vol. 11 No. 1.

Bock, F. (1999), ''The intelligent approach to knowledge management: viewing KM in terms of content, culture, process, and infrastructure'', *Knowledge Management Review*, Vol. 7, March-April, pp. 22-5.

Bonner, D. (2000), *Leading Knowledge Management and Learning*, American Society of Training & Development, Alexandria, VA.

Chiem, P.X. (2001), ''Form follows strategy: open and interactive office design supports cultural changes at the new BP'', *Knowledge Management Magazine*, 10 October, available at: www.destinationkm.com/print/default.asp?ArticleID=369

Cohen, D. and Prusak, L. (2001), *In Good Company: How Social Capital Makes Organizations Work*, Harvard Business School Press, Boston, MA.

Czarnecki, J.E. (2001), ''Expressing the art of good business'', *Architectural Record*, Vol. 11, November, pp. 90-113.

Darwin (2004), *Executive Guides: Knowledge Management*, CXO Media, Framingham, MA, available at: http://guide.darwinmag.com/technology/enterprise/knowledge/index.html#casestudy

Davenport, H.T. (1998), *Some Principles of Knowledge Management*, Graduate School of Business, University of Texas at Austin, Austin, TX, available at: www.mccombs.utexas.edu/kman/kmprin.htm#improving.

Davenport, H.T. and Prusak, L. (2000), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.

DeLong, D.W. and Fahey, L. (2000), ''Diagnosing cultural barriers to knowledge management'', *Academy of Management Executive*, Vol. 14 No. 4, pp. 113-27.

Detlor, B. (2004), *Towards Knowledge Portals: From Human Issues to Intelligent Agents*, Kluwer Academic Publishers, Dordrecht.

Drucker, P.F. (1988), ''The coming of the new organization'', *Harvard Business Review*, Vol. 66 No. 1, pp. 45-53.

Drucker, P.F. (1999), ''Knowledge worker productivity: the biggest challenge'', *California Management Review*, Vol. 41 No. 2, pp. 79-94.

Eisenhardt, K.M. (1989), ''Building theories from case study research'', *Academy of Management Review*, Vol. 14 No. 4, pp. 532-50.

Ellis, M.S. and Rumizen, M. (2002), ''The evolution of KM at Buckman Laboratories: how its KM program has developed with the new leadership'', *Knowledge Management Review*, Vol. 5 No. 1, pp. 12-15.

Eppler, M., Ropnack, A. and Seifried, P. (1999), ''Improving knowledge intensive processes through an enterprise knowledge medium'', *Proceedings of the 1999 ACM SIGPR Conference*, New Orleans, LA.

Gebert, H., Geib, M., Kolbe, L.M. and Riempp, G. (2002), ''Towards customer knowledge management: integrating customer relationship management and knowledge management concepts'', The Second International Conference on Electronic Business (ICEB 2002), Taipei, Taiwan, pp. 296-8.

Girard, J. (2004), *Management Update: Managing the Mobile and Wireless Workforce*, Gartner, Stamford, CT.

Gladwell, M. (2000), ''Designs for working; why your bosses want to turn your office into Greenwich Village'', *The New Yorker*, December, pp. 60-70.

Gordon, J.R. (2002), *Organizational Behaviour: A Diagnostic Approach*, 7th ed., Prentice Hall, Upper Saddle River, NJ.

Gottschalk, P. and Khandelwal, V.K. (2004), ''Stages of growth for knowledge management technology in law firms'', *Journal of Computer Information Systems*, Vol. 44 No. 4, pp. 111-24.

Gray, J.A.M. (1998), ''Where's the chief knowledge officer?'', *British Medical Journal*, Vol. 317 No. 7162, pp. 832-40.

Gupta, A.K. and Govindarajan, V. (2000), ''Knowledge management's social dimension: lessons from nucor steel'', *Sloan Management Review*, Vol. 42 No. 1, pp. 71-81.

Hackett, B. (2000), *Beyond Knowledge Management: New Ways to Work and Learn*, The Conference Board, New York, NY.

Hall, H. (2001), ''Input-friendliness: motivating knowledge sharing across intranets'', *Journal of Information Science*, Vol. 27 No. 3, pp. 139-46.

Hammer, M. (1990), ''Re-engineering work: don't automate, obliterate'', *Harvard Business Review*, Vol. 90 No. 4, pp. 104-12.

Hertog, J.F.D. and Huizenga, E. (2000), *The Knowledge Enterprise: Implementation of Intelligent Business Strategies*, Imperial College Press, London.

Kluge, J., Stein, W. and Licht, T. (2001), *Knowledge Unplugged: The McKinsey & Company Global Survey on Knowledge Management*, Palgrave, Basinstoke.

Kolleeny, J.F. (2003), ''Designing for well-being: environments that enhance the quality of life'', *Architectural Record*, Vol. 11, November, pp. 90-118.

Kroeber, A.L. and Kluckhohn, C. (1952), ''Culture: a critical review of concepts and definitions'', *Papers of the Peabody Museum of American Archaeology and Ethnology,* Vol. 47, pp. 41-72.

Krogh, G.V., Ichijo, K. and Nonaka, I. (2000), *Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*, Oxford University Press, New York, NY.

Kvale, S. (1996), *Interviews: An Introduction to Qualitative Research Interviewing*, Sage Publications, Thousand Oaks, CA.

Lave, J. and Wenger, E. (1991), *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, New York, NY.

Lemken, B., Kahler, H. and Rittenbruch, M. (2000), ''Sustained knowledge management by organizational culture'', *Proceedings of the 33rd Hawaii International Conference on System Sciences*, p. 64.

Lewis, B. (2002), ''On demand KM: a two-tier architecture'', *IT Professional*, Vol. 4 No. 1, pp. 27-33.

Louis, M.R. (1983), ''Organizations as culture-bearing milieux'', in Pondy, L.R., Frost, P., Morgan, G. and Dandridge, T.C. (Eds), *Organizational Symbolism*, JAI Press, Greenwich, CT.

McLure, W. and Faraj, S. (2000), '''It is what one does': why people participate and help others in electronic communities of practice'', *The Journal of Strategic Information Systems*, Vol. 9 Nos 2/3, pp. 155-73.

Malhotra, Y. (2004), ''Why knowledge management systems fail? Enablers and constraints of knowledge management in human enterprises'', in Koenig, M.E.D. and Srikantaiah, T.K. (Eds), *Knowledge Management Lessons Learned: What Works and What Doesn't*, Information Today, Medford, NJ.

Malhotra, Y. and Galletta, F.D. (2003), ''Role of commitment and motivation in knowledge management systems implementation: theory, conceptualisation, and measurement of antecedents of success'', *Proceedings of 36th Hawaii International Conference On Systems Sciences*, IEEE Computer Society, Los Alamitos, CA.

Marsh, R. and Satyadas, A. (2003), ''Knowledge management in IBM Corporation'', in Rao, M. (Ed.), *Leading with Knowledge: Knowledge Management Practices in Global Infotech Companies*, Tata McGraw-Hill, New Delhi.

Martin, J. and Siehl, C. (1983), ''Organizational culture and counterculture: an uneasy symbiosis'', *Organizational Dynamics*, Vol. 12, Autumn, pp. 52-64.

Miles, M. and Huberman, A. (1994), *Qualitative Data Analysis*, Sage Publications, Thousand Oaks, CA.

Natarajan, G. and Shekhar, S. (2000), *Knowledge Management: Enabling Business Growth*, Tata McGraw-Hill, New Delhi.

Nissen, M. and Levitt, R.E. (2004), ''Agent-based modelling of knowledge flows: illustration from the domain of information systems design'', *Proceedings of 37th Hawaii International Conference on System Sciences*, IEEE Computer Society, Los Alamitos, CA.

Nissen, M., Kamel, M. and Sengupta, K. (2000), ''Integrated analysis of and design of knowledge systems and processes'', *Information Resources Management Journal*, Vol. 13 No. 1, pp. 24-43.

Nonaka, I. and Konno, N. (1998), ''The concept of 'ba': building a foundation for knowledge creation'', *California Management Review*, Vol. 40 No. 3, pp. 1-15.

Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, NY.

Österle, H. (2001), ''Enterprise in the information age'', in Österle, H., Fleisch, E. and Alt, R. (Eds), *Business Networking: Shaping Collaboration Between Enterprises*, Springer, Berlin, pp. 17-54.

Pacanowsky, M.E. and O'Donnell-Trujillo, N. (1983), ''Organizational communication as cultural performance'', *Communication Monographs*, Vol. 50, pp. 126-47.

Patton, M.Q. (1990), *Qualitative Evaluation and Research Methods*, 2nd ed., Sage Publications, Newbury Park, CA.

Paul, L.G. (2003), ''Why three heads are better than one: how to create a know-it-all company'', *CIO Magazine*, Vol. 17 No. 5, pp. 94-106.

Porter, M.E. and Millar, V.E. (1985), ''How information gives you competitive advantage'', *Harvard Business Review*, Vol. 63 No. 4, pp. 149-60.

Preece, J. (2000), *Online Communities: Designing Usability, Supporting Sociability*, John Wiley & Sons, Hoboken, NJ.

Rastogi, P.N. (2000), ''Knowledge management and intellectual capital: the new virtuous reality of competitiveness'', *Human Systems Management*, Vol. 19 No. 4, pp. 39-49.

Reinhardt, R. (2005), ''Implementation of an intellectual capital management system: advantages of a 'bottom-up' approach'', *Journal of Universal Knowledge Management*, Vol. 0 No. 1, pp. 67-73.

Remus, U. and Schub, S. (2003), ''A blueprint for the implementation of process-oriented knowledge management'', *Knowledge and Process Management Journal*, No. 4, pp. 237-53.

Ribiere, V. and Sitar, A. (2003), ''Critical role of leadership in nurturing knowledge supporting culture'', *Knowledge Management Research and Practice*, Vol. 1 No. 1, pp. 39-48.

Rousseau, D.M. (1990), ''Assessing organizational culture: the case for multiple methods'', in Schneider, B. (Ed.), *Organizational Climate and Culture*, Jossey-Bass, San Francisco, CA.

Ruggles, R. (1998), ''The state of the notion: knowledge management in practice'', *California Management Review*, Vol. 40 No. 3, pp. 80-9.

Rumizen, M.C. (2002), *The Complete Idiot's Guide to Knowledge Management*, CWL Publishing, Madison, WI.

Schein, E.H. (1996), ''Three cultures of management: the key to organizational learning'', *Sloan Management Review*, Vol. 38 No. 1, pp. 9-20.

Schein, E.H. (1999), *The Corporate Culture Survival Guide*, Jossey-Bass, San Francisco, CA.

Silverman, D. (1985), *Qualitative Methodology and Sociology: Describing the Social World*, Gower Publishing, Aldershot.

Skyrme, D.J. (1999), *Knowledge Networking: Creating the Collaborative Enterprise*, Butterworth Heinemann, Oxford.

Smith, M.F. (1983), ''Sampling considerations in evaluating cooperative extension programs'', Florida Cooperative Extension Service Bulletin, PE-1, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.

Spies, M., Clayton, A.J. and Noormohammadian, M. (2005), ''Knowledge management in a decentralized global financial services provider: a case study with Allianz Group'', *Knowledge Management Research and Practice*, Vol. 3 No. 2, pp. 24-36.

Stake, R.E. (2000), ''Case studies'', in Denzin, N.K. and Lincoln, Y.S. (Eds), *Handbook of Qualitative Research*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Stamps, D. (1997), ''Communities of practice: learning is social, training is irrelevant?'', *Training*, Vol. 34 No. 2, pp. 34-42.

Steven, C. (1989), *Postmodernist Culture: An Introduction to Theories of the Contemporary*, Blackwell, Oxford.

Teece, D. (1998), ''Capturing value from knowledge assets: the new economy, markets for know-how, and intangible assets'', *California Management Review*, Vol. 40 No. 3, pp. 55-79.

Teleos (2003), *2003 Asian Most Admired Knowledge Enterprises (MAKE) Report*, Teleos, Bedford.

Teleos (2004), *2004 Global Most Admired Knowledge Enterprises (MAKE) Report*, Teleos, Bedford.

Tyler, E.B. (1871), *Primitive Culture: Researchers into the Development of Mythology, Philosophy, Religion, Art and Custom*, Vol. 1, John Murray, London.

Welch, J. and Welch, S. (2005), *Winning*, HarperCollins, New York, NY.

Wenger, E. (2004), ''Knowledge management as a doughnut: shaping your knowledge strategy through communities of practice'', *Ivey Business Journal*, January-February, pp. 1-7.

Wenger, E., McDermott, R. and Snyder, W.M. (2002), *A Guide to Managing Knowledge: Cultivating Communities of Practice*, Harvard Business School Press, Boston, MA.

Wilson, T.D. (2002), ''The nonsense of 'knowledge management''', *Information Research*, Vol. 8 No. 1, available at: http://InformationR.net/ir/8-1/paper144.html

Yin, R.K. (2002), *Case Study Research: Design and Methods*, 3rd ed., Sage Publications, Thousand Oaks, CA.

Further reading

Delic, A.K. (2003), ''Case study: KM tools and infrastructure supporting a business process'', *Knowledge Board*, available at: www.knowledgeboard.com/download/2518/case-study2.pdf

Delic, A.K. and Lahiax, D. (1998), ''Knowledge harvesting, articulation, and delivery'', *The Hewlett-Packard Journal*, May, pp. 74-81.

Drucker, P.F. (1993), *Post-Capitalist Society*, Butterworth Heinemann, Oxford.

Lacity, M.C., Willcocks, L.P. and Feeny, D.F. (1996), ''The value of selective IT sourcing'', *Sloan Management Review*, Vol. 37 No. 3, pp. 13-25.

Macalister, T. (2005), ''Sainsbury IT chief denies poor performance'', *The Guardian*, 20 January, available at: www.guardian.co.uk/supermarkets/story/0,12784,1394326,00.html

Nonaka, I. (1994), ''A dynamic theory of organizational knowledge creation'', *Organization Science*, Vol. 5 No. 1, pp. 14-37.

Rolland, N. (2004), ''Knowledge management impacts on the decision-making process'', *Journal of Knowledge Management*, Vol. 8 No. 1, pp. 20-31.

Wenger, E. (1998), *Communities of Practice: Learning, Meaning and Identity*, Cambridge University Press, Cambridge.

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