Faculty Publications - School of Business   School of Business

2009

A Qualitative Inquiry into Organisational Culture's Moderating Effect on Knowledge Management Projects in the Aerospace and Defense Industry

Frank D. Christopian
Regent University

Tim Rahschulte
George Fox University, trahschulte@georgefox.edu

Recommended Citation

A qualitative inquiry into organisational culture's moderating effect on knowledge management projects in the aerospace and defense industry

Frank D. Christopian*

Regent University,
1000 Regent University Drive,
Virginia Beach, Virginia 23464, USA
Fax: 321-255-2017   E-mail: franch1@regent.edu
*Corresponding author

Tim Rahschulte

George Fox University,
414 N Meridian Street,
Newberg, Oregon 97132, USA
Fax: 503-554-2829   E-mail: trahschulte@georgefox.edu

Abstract: The management of knowledge permeates the social fabric of business enterprises today. Many suggest that the success of knowledge management is predominately associated with organisational culture. However, while researchers typically conclude that organisational culture affects knowledge management projects, initiatives and organisational effectiveness, there is a lack of research in this regard in the aerospace and defense industry. The research in this manuscript leveraged grounded theory protocols and existing research conducted in other industries to investigate specific cultural implications of organisational knowledge management activities in aerospace and defense companies. A constructivist knowledge claim position yielded theoretical observations about this phenomenon.

Keywords: knowledge management; organisational culture; project management; communication; performance; collaboration; team; change; grounded theory.

Biographical notes: Frank D. Christopian is an Adjunct Professor at Regent University and the Florida Institute of Technology. His research and teaching are in the areas of organisational leadership and management, organisational design and development, knowledge management and global team management.

Tim Rahschulte is an Assistant Professor of Management at George Fox University. His research, teaching and lecturing are in the areas of leadership, organisational change, human resource development, and global management of teams and programmes.

1 Introduction

The management of knowledge permeates the social fabric of business enterprises today. It is knowledge that assures organisational competitiveness due to its difficulty to imitate, copy or exploit (Davenport and Prusak, 1998; Liedtka, 1999). The management of knowledge has been described as 'the systematic, explicit, and deliberate building, renewal and application of knowledge to maximise an enterprise's knowledge-related effectiveness and returns from its knowledge assets' [Wiig, (1997), p.70]. In operative terms, knowledge management represents a process of personal and systematised transfer so as to assure knowledge resides at the right place, with the right person and at the right time for optimal decision-making (Petrash, 1999).

It is believed that organisational culture serves a moderating role in the effectiveness of knowledge management. Alavi and Leidner (1999) indicated that research studies investigating knowledge management initiatives revealed that organisational cultures are the principal enablers or impediments to success. Hackett (2000) concluded that organisations with successful knowledge management initiatives frequently cited their inherent culture as the crucial factor behind their achievement. According to Hofstede (2001) and Hutchings and Michailova (2004), the cultural values of individual employees significantly influence knowledge creation, sharing, communication and learning within organisations – all of which are critical success factors to project management and effective project implementation. Others (Hansen et al., 1999; Holtshouse, 1998; Michailova and Husted, 2003; Santoro and Gopalakrishnan, 2000) have also acknowledged that organisational culture plays a significant role in the implementation of knowledge management systems, processes, projects and programmes. Kunda (1992) specifically noted that strong organisational cultures reinforce strongly held values, thus, moderating individual behaviour and performance. Certainly, there is an indivisible relationship between effective knowledge management and individuals who collectively make up an organisational culture (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995; Von Krogh et al., 2000). Thus, it is the organisation's culture that is of great importance here.

Conceptually, an organisational culture represents accepted methods by which tasks are standardised and accomplished by employees as these social mores either encourage or preclude the maximum efforts by organisational members (Blake and Mouton, 1969). Typically, organisational culture reflects a framework of shared basic assumptions affecting employee abilities to perceive, to think and to feel in relation to various problem solving activities (Schein, 1999). The persuasive effects of organisational culture relative to knowledge management have been a fascination of many researchers. For instance, Park et al. (2004) researched US firms that were implementing knowledge management endeavours and found sufficient evidence to establish a correlation between cultural attributes and the successful implementation of knowledge management technologies and institutionalised knowledge sharing. Operationally, Park et al. defined cultural attributes as trust, freely sharing information, working closely with others or developing friends at work.

As noted, there are a number of noteworthy studies published on topics such as organisational culture, knowledge management technologies, knowledge-intensive firms, care for knowledge sharing and idyllic climates for knowledge sharing. Research by Tang (2008) revealed that company size, assets and number of employees were directly related to the extent to which the company effectively utilised product realisation knowledge in

its production operations. Kasper et al. (2008) concluded that decentralised knowledge management structures clearly affect the intensity of intra-organisational knowledge sharing. Further, Powell and Swart (2005) noted that managers should be cognisant of the different forms of knowing that influence business success (e.g., knowing what, knowing how, knowing why and knowing who). However, although much has been written about organisational cultures being the critical reason for the successes, and failures, of knowledge management projects and initiatives, it has been concluded that more needs to be known about the particular cultures that significantly influence these endeavours (Alavi and Leidner, 2001; Davenport and Prusak, 1998; De Long and Fahey, 2000). This anomaly is acute in view of the relatively secretive nature of the aerospace and defense industry. As such, adding to the existing literature, the aerospace and defense industry was chosen for further research due to the uncharacteristic nature of the business and the apparent clandestine environment in which many employees operate.

To further support the delimitation of this study, the extant literature to date typically addresses traditional organisations or firms that do not operate under surreptitious conditions nor comply with inordinate governmental regulations. Typically, many aerospace contractors are heavily dependent upon military programmes financed by the government and provide a wide array of war materiel and equipment through highly classified programmes. To accommodate the success of these programmes, many aerospace and defense contractors have espoused knowledge management projects and initiatives as the primary means to enhance and optimise internal resources. Perceptibly, industry concerns for national security and governmental regulations including the International Traffic in Arms Regulations could be viewed as potentially significant barriers to conventional knowledge management and knowledge sharing. The highly secretive nature of many defense contractors within the industry sector led the research team to question whether this inordinately enigmatic culture would have any discernible effect upon knowledge management technologies, which are predicated upon free-flowing channels of communications and extensive knowledge sharing.

These appreciably covert business practices with concerns for national security led the research team to question the value of a quantitative study since the organisational culture profile or other valid survey instruments may not adequately or effectively appraise the vital nature of the organisations' intrinsic cultures. While it is acknowledged that organisational culture affects worthwhile endeavours to implement knowledge management technologies, it is the key traits or nuances of the culture that exert the most influence over new systems, processes and technologies designed to manage knowledge across the enterprise at large. This concern led the research team to examine the defining characteristics of organisations that operate in a non-conventional business environment. In view of the need for a greater understanding into the character and temperament of the organisational cultures within the aerospace industry, a qualitative method was used to collect data reflective of the organisations in this study.

2   Methodology

The objective of this study was to investigate how organisational culture moderates knowledge management initiatives in the aerospace and defense industry. This research study aimed more specifically to determine what theory or theories emerged from the

experiential learning of the participants relative to their organisational culture and the net effects that the innate culture evidently had on the organisational understandings of the basic knowledge constructs and knowledge management initiatives within the organisation.

The balance of this research study details a constructivist knowledge position taken to offer theoretical observations regarding how specific cultural characteristics affect organisational tasks, individuals and project team initiatives delimited to US aerospace and defense businesses. As such, the strategy of inquiry followed a qualitative research method using grounded theory protocols. Grounded theory is appropriate for this study due to its systematic methodology to study rich and diverse experiential human conditions to generate 'relevant, plausible theory' from which one can understand the 'contextual reality of social behaviour' [Hutchinson, (1988), pp.126–127]. The use of grounded theory allows the researcher 'to derive a general, abstract theory of a process, action or interaction grounded in the views of the participants in a study' [Creswell, (2003), p.14]. Further, according to Patton (2002), grounded theory protocols allow researchers to examine the participants' environment from the viewpoint of the study participants so that any emerging theory and study findings are empirically grounded. Therefore, the grounded theory method (Strauss and Corbin, 1998) was used to facilitate the data collection, analyses and reporting in this study.

As with all research, validity is important. While validity in quantitative research is dependent upon the meticulous construction of survey instruments to ensure that the devices used actually measure the intended objectives (Patton, 2002), in qualitative inquiry, the researcher is the instrument. Therefore, the credibility of qualitative method relies on the skill and competence of the researcher. Patton stated that these potential deficiencies in the research instrument (i.e., the researcher) can be appreciably offset by the flexibility and insights gained through the human component. Validity in its conventional form is not an issue in grounded theory, which instead is evaluated by fit, relevance, workability and modifiability (Glaser, 1998; Glaser and Strauss, 1967). Fit reflects how closely the concepts coincide with the incidents they represent. Relevance characterises the concerns of the respondents, thereby, constituting a relevant study. Workability requires the theory to work plausibly as it explicates how the problem is solved with obvious variation. Lastly, modifiability requires any theory to possess the capacity to be altered when new pertinent data is examined and compared to existing data (Glaser, 1998). The researchers accommodated validity through means of precise data collection and analysis.

The sampling strategy commenced conveniently and emerged theoretically (Patton, 2002). A total of 23 topical experts were individually interviewed to reach data saturation. The primary aim of sampling aerospace employees was to discern the key characteristics or traits that may be reflective of the industry sector as a whole. Participants were chosen from four major aerospace and defense contractors in the southeastern region of the US. To obtain an organisational cross-section, respondents were selected from different functional departments including engineering, logistics, manufacturing, materiel operations and quality assurance operations. Further, interviewees represented all employment levels or salary grades including hourly, salaried and managerial classifications. Departmental directors suggested initial candidates for interview with subsequent interviewees being chosen through employee referrals during the interview process, thus, theoretically emergent (Patton). All participation was strictly voluntary.

Since cultural acclimation is relatively subjective, all participants were required to have greater than five years in their current job to ensure they were reasonably acclimated to their respective organisations. Employees were selected based upon their willingness to participate, current aerospace employment, organisational seniority and expert knowledge relative to their organisation's knowledge management projects and system. In short, all members in the sample were expert 'participants in action' [Hassard, (1991), p.277] and thus appropriate for the study. Participants were employed an average of 17.5 years in the industry and 12.8 years with their current employer. The sample included 12 White males, five White females, four African-American males and two African-American females. Overall, the composite race and gender profile is considered typically reflective of the aerospace industry.

Engaging the sample was done through means of a semi-structured interview questionnaire. The purpose of the interview inquiries was to explore each individual's experience with their culture and knowledge management initiatives, both from an organisational perspective and an individual perspective. The semi-structured interview focused on gaining personal sentiments on these experiences as well as gain insights. To best do so, open-ended questions asked during the interview were both descriptive and inferential. Creswell (2003) noted that descriptive questions help illuminate model variables and inferential questions help relate the variables. The interview questionnaire and approach was developed and subjected to field tests to ensure each designed question was appropriate for the intended objective. To be sure, the questions were not finite. By the nature of semi-structured interviews, there is latitude to explore and discover the experiences of each participant as the interviews evolve. Each question was a control, theory or company specific inquiry and supported by the literature. The control questions were designed to yield data that affirm each participant's expertise. Theory questions were designed to yield data that address aforementioned literature concerns. Company specific questions were designed to yield data that further define the sample and organisation under study.

The data collection consisted of documenting detailed field notes taken by the researchers. Field notes and conclusions were submitted to each participant for their review and concurrence in order to ensure accuracy and completeness. This structured layering technique [Flick, (2002), p.82] served as a means to mitigate researcher bias and was appropriate since neither audio nor video recording was used. Glaser (1998) sanctioned this methodology by maintaining that transcription invariably slows down the process and produces far too much unrelated or unnecessary data. Strauss (1987) affirmed that the need for transcribing interviews is dependent upon the research and recommended selective transcriptions only where appropriate.

Following grounded theory protocols, the data collected from the respondents were coded using open, axial and selective coding processes (Strauss and Corbin, 1998). This constant comparative method initiated by Glaser and Strauss (1967) is a reiterative process for theory development 'which would allow for the emergence of categories from the data as an alternative to the hypothetico-deductive approach in social research' [Kelle, (2005), p.2]. Open coding was to identify, name, categorise and describe the phenomena found in the field notes and observations of the researcher. Open coding required careful analysis of the detailed field notes collected from the respondents during the interview process. All field notes were evaluated line by line and word by word. Axial coding was performed through which assigned codes were reviewed for

relationships (e.g., categories and properties) to each other using both inductive and deductive reasoning. The purpose of axial coding was to establish which types of phenomena, causal and intervening conditions, contexts, actions and consequences are relevant. Herein, causal relationships were examined during the axial coding process with the intent to establish a framework of basic relationships. Selective coding was performed after completing the axial coding process as this phase of the analysis facilitated the selection of a leading category to become the core category to which all other categories were evaluated for interrelationships to the selected core category. Strauss and Corbin (1998) maintained that the principal objective is to construct a plausible précis around which everything else becomes related and explained. Kelle (2005) noted that there is a fundamental expectation that a core construct always exists, thereby, allowing grounded theory to draw from the literary analysis.

3   Findings

Due to the complexity of the study phenomenon, not all categorical findings captured require elaboration. With the range of observational interaction and documentation and after significant analysis of the data, categories and relationships, some findings were simply deemed not applicable to this study and if incorporated here would serve to only congest the findings relative to the aim of this study. This approach is supported by Parry (1999), who noted that it is not necessary to detail all the categories that emerged from the study, but rather just those that are pertinent to the subject of the research project. As such, only the pertinent findings are detailed hereto, as theoretically grounded observations.

3.1   Effective communications

Observation 1   Aerospace organisations with leaders and managers who openly encourage effective communications throughout the organisation and who actively seek to remove or decrease managerial hierarchical barriers (i.e., conventional management system with chains-of-command vertical communications processing) will be more proficient at implementing new strategic initiatives such as knowledge management.

The importance of communication emerged as the primary concept affecting projects and initiatives such as knowledge management. This was a systemic and repetitive concern noted throughout the interview process. A common note from every interview was the subject of organisational communications. Specifically, an inordinate amount of frustration was voiced due to ineffective communications from senior leaders and managers who ineffectively communicate project goals, objectives, methods, implementation strategies and relationship(s) to other business priorities such as intra-organisational projects and dependencies. In effect, the employees who were directed and tasked with supporting these endeavours wanted to know more about the tactical intentions of the senior leadership team and their managers regarding these initiatives. Notably, most employees sought an understanding as to how these new objectives would be accomplished or phased-in over time, the required timelines or major milestones, any

pertinent critical performance measures and the long-term objectives for these new ventures. Further, and importantly, the prioritisation of new initiatives was the chief concern in view of normal daily operations and the widespread sense that many employees were already over tasked and under considerable stress to perform to established organisational objectives for production, cost, schedule and product quality.

Due to ineffective communications, the sample indicated that employees commonly felt a growing sense of frustration, dissatisfaction and experienced a general lack of motivation and commitment to initiatives. Commonly cited were the one-way 'chain-of-command' communications (i.e., top-down information processing) that merely instructed or directed, but did not explain the purpose, rationale, long- or short-term objectives, nor provided adequate motivational support to ensure employee commitment. Ironically, managers questioned during the interview process were more inclined to believe that the existing systems and procedures in place for organisational communications were completely sufficient. Moreover, some managers indicated that they did not feel the compelling need to share certain information or communicate fully with subordinate employees.

Findings further delineated this theoretical observation into three additional (sub)observations all of which are related to the need for effective communications and detailed hereto.

Observation 1a   Active participation – aerospace organisations with leaders
                 and managers who establish and communicate clearly defined goals,
                 objectives, strategies, and priorities and who are actively engaged and
                 participate in all aspects of new projects or programmes will be more
                 proficient and successful at implementing new strategic initiatives.

While effective communications constitute a large part of this observation, the essential point here is the active engagement of rank-and-file employees throughout the organisation. Respondents indicated that managers often communicated cursory directions to implement new strategies or objectives without insights into the rationale or the necessary guidance to ensure successful conclusions. The implementations of important business decisions require the active participation of all employees. Active participation in setting priorities may help to alleviate employee angst and help achieve organisational goals, objectives and new strategies. Further, according to the respondents, active participation, timely intervention and ancillary support by managers were needed to maintain focus and to bring additional resources to bear when needed. Active participation and effectual employee involvement are critical to ensure the success of new business strategies and innovative measures such as knowledge management.

Observation 1b   Meaningful motivation – aerospace organisations with leaders
                 and managers who vigorously demonstrate and communicate the
                 unswerving commitment to initiatives and instil motivation for
                 employees to contribute to organisational objectives will be more
                 proficient at implementing initiatives such as knowledge management.

Interview respondents were inclined to doubt the commitment of senior leaders and managers to new projects and objectives. The members of the sample offered stories about the inherent problem with most strategies or initiatives suggesting that they do not come with additional resources in terms of funding, personnel and time. As a result, the

current workforce muddles through by attempting to address the new requirements in conjunction with the existing workload. Consistently, the sample iterated that after the initial kick-off meetings for many new strategies, the visibility for these programmes typically wanes and continues to decline over time. In effect, the lack of management commitment results in poor employee motivation, thereby, affecting project- and organisational-level performance. Senior management commitment can mitigate this occurrence. Commitment can be illustrated through effective communications, which can also provide guidance and inspire meaningful motivation throughout the workforce. According to Argyris (1998, p.99), 'commitment is about generating human energy and activating the human mind. Without it, the implementation of any new initiative or idea would be seriously compromised'.

Observation 1c   Candid cooperation – aerospace organisations with leaders and managers who foster an organisational culture of openness and cooperation through two-way communications and meaningful dialogues will meet less employee resistance when implementing new tactical measures and will experience greater proficiencies and successes with new strategic initiatives.

This observation differs from the other posited theories in that it addresses the idyllic state of organisational culture for openness and cooperation. Candid cooperation is dependent upon an environment of mutual trust and shared objectives. Through increased and effective two-way communications, meaningful dialogues and ongoing interactions between employees and managers, it is hypothesised that the organisation will experience greater successes with new strategic initiatives and will become significantly more proficient at launching and implementing new projects, products and programmes, as required. Here, the extent of candid cooperation required is similar to the people-based 'communities of practice' (Wenger, 1998, 1999).

    Moving forward, most respondents envisioned the need for increased and more effective communications throughout the organisation. This communication can lead to increased individual and organisational-wide participation, motivation and cooperation. As Senge (1990) noted, encouraging effective communications, eliminating all managerial hierarchical barriers and committing to innovative initiatives throughout the organisation may help to create revitalised business enterprises that are receptive to change and adaptable to embrace it. Ostensibly, Senge's precognitions certainly align with continuing emblematic needs in the aerospace and defense sector.

3.2 Embracing change

Observation 2   Aerospace organisations with leaders and managers who are change-oriented, focused on continuous improvements, and who demonstrate the willingness to seek input and learn, while operating in an open and accepting culture, will be more successful at implementing new strategic initiatives such as knowledge management.

In the aerospace and defense industry, operating in an open and accepting culture is not always easy. A significant challenge for this industry remains the considerable concerns for national security, programme or product secrecy, and the safeguarding of classified or proprietary information. As noted by respondents during the interview process, the

proper handling of classified data and documents by employees with the appropriate defense clearance is an ongoing concern and a high priority. These crucial concerns to protect national security and classified information tend to have an overall negative psychological effect on the ideal concept for free-flowing information sharing and organisational knowledge transfers that are fundamental to building a culture of change readiness and intra-organisational project collaboration since the culture tends to evolve into a 'need to know' framework that fosters secrecy, individualism and a certain degree of mistrust.

Typically, respondents in this study indicated that they had some reservations about sharing information unless they knew the other employees well and fully understood the purpose they needed to know certain information. Generally, respondents expressed an innate desire to be cooperative, but hesitated to do so in certain situations. For most employees, knowledge sharing represents behavioural change that requires institutional endorsement in order to affect change. This anomaly seems to have less to do with actual classified information and national security requirements as the incongruities have with the psychological effects and institutionalised behaviours throughout the organisation that have become the cultural norm. Here, the individualist inclinations may override the greater organisational interest for cooperation and openness (Triandis, 1995).

Moving forward, the challenge for aerospace leaders and managers will be to ensure security while creating a culture of openness that is consistently receptive to new concepts, innovative ideas and readily embraces change. Taylor and Wright (2004) noted that some cultural concerns must be addressed when sharing knowledge including the requirement that the organisational culture be open, accepting to new thoughts and infused with employee motivation to contribute to organisational objectives. Moreover, industry leaders and organisational managers must be change-oriented, focused on continuous improvement.

3.3   Collaborative culture

Observation 3   Aerospace organisations with a collaborative organisational culture that supports an environment conducive to organisational learning will be more proficient at implementing new strategic initiatives (e.g., knowledge management), especially when training and development technical support is enlisted to communicate the initiatives, specific objectives, and promote employee instruction and training on new systems, processes or procedures.

A collaborative organisational culture is needed that fully nurtures and supports an environment that is conducive to organisational learning. The respondents anticipated that through increased organisational learning and collaboration, the business enterprise as a whole would be more successful at implementing projects and strategic initiatives. An example of the needed collaboration was noted by the sample relative to human resource development. The sample suggested the training and development unit, typically one of the primary functions of human resources, take a leadership role in the design, development and deployment of new strategic initiatives. In the case of knowledge management, it was clearly evident that coursework designers and employees from the training and development organisation played no special roles in the design or

development of pertinent training programmes or classes and, as a result, these strategic projects were impacted.

Relative to Observation 2, embracing change, Huber (1991) maintained that organisational learning is a vital process by which managers may achieve desired behavioural changes in employees to facilitate needed change initiatives. Additionally, Argyris (1993) indicated that organisational learning was an effective method to overcome employees' natural resistance towards organisational changes and new business strategies. Moreover, collaboration is valuable among teams and their members due to the optimising power of a social unit towards problem solving and solution building (Stewart et al., 1999).

Clearly, the way forward requires organisational leaders and managers to embrace organisational learning as a means to collaborate within and across projects that will affect the entire organisation. Utilising the internal resources available through the training and development organisations may help to start the long-term process towards overall organisational learning. In the short-term, training and development personnel may be instrumental for affecting Observation 1, effective communications, including concerns about organisational initiatives and objectives, while providing increased levels of employee instruction and formal training on the latest systems and processes.

4 Conclusions

This study examined the effects of organisational culture on knowledge management projects and initiatives as applied by major defense contractors within the aerospace industry. The grounded theory research method of data collection, analysis and reporting discovered a remarkable level of cultural commonality evident within this industry. This commonality is one of the major surprises in the results emanating from the data. Typically, the sample participants were inclined to think that their problems were unique, their situations were special and their wants or needs were inimitable. Ironically, most diagnosed problems were interchangeable from one aerospace and defense contractor to another and thus ubiquitous. As such, perhaps common solutions to the implementation of knowledge management strategies may benefit the industry as a whole.

Principally, three theoretical observations were made pertaining to:

a   ineffective organisational communications

b   resistance to change

c   lack of intra-project and cross-enterprise collaboration.

Generally, these qualitative findings reiterate previous results of research conducted in more traditional business climates, but were found to be exacerbated in secretive cultural climates obsessed with a 'need to know' mentality, compliance with governmental regulations and the paramount concern for national security. Findings indicated a strong desire for conspicuous changes in organisational cultures specifically with the need for improved communications, collaboration and a general spirit of cooperation. While focus of the study was on knowledge management projects and initiatives, these observations and their implications are culturally grounded. Reiteration of Davenport and Prusak (1998), Bock (1999), Nonaka and Takeuchi (1995), Rastogi (2000) and Von Krogh et al. (2000) is warranted here in that, due to its centrality, an assessment of

organisational culture should be conducted before deploying new projects and initiatives. The findings from the assessment can inform project plans to help assure greater implementation effectiveness.

As noted, these findings may be dismissed initially as common due to the reiteration of prior research. However, the research here only broadens the extent to which contrasting industries and organisations have been appraised relative to cultural climates, the successes of knowledge management and the urgent need for knowledge sharing. It is the uncanny commonality of these findings that makes further research scholastically relevant and more compelling, although with limitations. While these findings are considered essential to understanding the effects of organisational culture on knowledge management, no deductive conclusions should be drawn from this research alone or generalisations applied to the entire industry. There are a number of differences between various organisations, within this rather complex and diverse industry as well as the nuances of cultural variations from country to country (Hofstede, 2001). These findings, however, can serve as a means to facilitate further research. As a foundation for future research, the aerospace and defense industry should be examined through careful comparisons to conventional businesses and industries as a means to discern the underlying reasons and explain these common mediating factors in dissimilar organisations. As organisational culture remains both a formidable obstacle and a significant opportunity, the paramount goal of understanding the complexities of this important topic will certainly continue as a basis for future research.

References

Alavi, M. and Leidner, D.E. (1999) 'Knowledge management systems: emerging views and practices from the field', *Proceedings from the 32nd Hawaii International Conference on System Sciences*, USA, pp.1–11.

Alavi, M. and Leidner, D.E. (2001) 'Review: knowledge management and knowledge management systems: conceptual foundations and research issues', *MIS Quarterly*, Vol. 25, No. 1, pp.107–136.

Argyris, C. (1993) *On Organizational Learning*, 2nd ed., Blackwell, Malden, MA.

Argyris, C. (1998) 'Empowerment: the emperor's new clothes', *Harvard Business Review*, Vol. 76, No. 3, pp.98–105.

Blake, R.R. and Mouton, J.S. (1969) *Building a Dynamic Corporation through Grid Organizational Development*, Addison-Wesley Publishing, Reading, MA.

Bock, F. (1999) 'The intelligent approach to knowledge management: viewing KM in terms of content, culture, process, and infrastructure', *Knowledge Management Review*, Vol. 7, pp.22–25.

Creswell, J.W. (2003) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Davenport, T.H. and Prusak, L. (1998) *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.

De Long, D.W. and Fahey, L. (2000) 'Diagnosing cultural barriers to knowledge management', *The Academy of Management Executive*, Vol. 14, No. 4, pp.113–127.

Flick, U. (2002) *An Introduction to Qualitative Research*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Glaser, B.G. (1998) *Doing Grounded Theory – Issues and Discussions*, Sociology Press, Mill Valley, CA.

Glaser, B.G. and Strauss, A.L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine Transactions, New Brunswick.

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

Hansen, M.T., Nohria, N. and Tierney, T. (1999) 'What's your strategy for managing knowledge?', *Harvard Business Review*, Vol. 77, No. 2, pp.106–116.

Hassard, J. (1991) 'Multiple paradigms and organisational analysis: a case study', *Organisation Studies*, Vol. 12, No. 2, pp.275–299.

Hofstede, G. (2001) *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Holtshouse, D. (1998) 'Knowledge research issues', *California Management Review*, Vol. 40, No. 3, pp.277–280.

Huber, G.P. (1991) 'Organizational learning: the contributing processes and the literatures', *Organization Science*, Vol. 2, No. 1, pp.88–115.

Hutchings, K. and Michailova, S. (2004) 'Facilitating knowledge sharing in Russian and Chinese subsidiaries: the role of personal networks and group membership', *Journal of Knowledge Management*, Vol. 8, No. 2, pp.84–94.

Hutchinson, S.A. (1988) 'Education and grounded theory', in R. Sherman and R.B. Webb (Eds.): *Qualitative Research in Education: Focus and Methods*, pp.123–138, The Falmer Press, New York.

Kasper, H., Mühlbacher, J. and Müller, B. (2008) 'Intra-organisational knowledge sharing in MNCs depending on the degree of decentralization and communities of practice', *Journal of Global Business and Technology*, Vol. 4, No. 1, pp.59–68.

Kelle, U. (2005) 'Emergence vs. forcing of empirical data? A crucial problem of grounded theory reconsidered', *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, Vol. 6, No. 2, available at http://www.qualitative-research.net/index.php/fqs/issue/view/26 (accessed on 20 February 2008).

Kunda, G. (1992) *Engineering Culture: Control and Commitment in a High Tech Corporation*, Temple University Press, Philadelphia, PA.

Liedtka, J.M. (1999) 'Linking competitive advantage with communities of practice', *Journal of Management Inquiry*, Vol. 8, No. 1, pp.5–16.

Michailova, S. and Husted, K. (2003) 'Knowledge sharing hostility in Russian firms', *California Management Review*, Vol. 45, No. 3, pp.59–77.

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

Park, H., Ribière, V. and Schulte, W.D., Jr. (2004) 'Critical attributes of organizational culture that promote knowledge management technology implementation success', *Journal of Knowledge Management*, Vol. 8, No. 3, pp.106–117.

Parry, K.W. (1999) 'Enhancing adaptability: leadership strategies to accommodate change in local government settings', *Journal of Organizational Change Management*, Vol. 12, No. 2, p.134.

Patton, M.Q. (2002) *Qualitative Research and Evaluation Methods*, 3rd ed., Sage Publications, Thousand Oaks, CA.

Petrash, G. (1999) 'Dow's journey to a knowledge value management culture', *European Management Journal*, Vol. 14, No. 4, pp.365–373.

Powell, J.H. and Swart, J. (2005) 'This is what the fuss is about: a systemic modelling for organisational knowing', *Journal of Knowledge Management*, Vol. 9, No. 2, pp.45–58.

Rastogi, P.N. (2000) 'Knowledge management and intellectual capital: the new virtuous reality of competitiveness', *Human Systems Management*, Vol. 19, No. 1, pp.39–49.

Santoro, M.D. and Gopalakrishnan, S. (2000) 'The institutionalization of knowledge transfer activities within industry-university collaborative ventures', *Journal of Engineering Technology Management*, Vol. 17, Nos. 3/4, pp.299–319.

Schein, E.H. (1999) *The Corporate Culture Survival Guide: Sense and Nonsense about Culture Change*, Jossey-Bassm, San Francisco, CA.

Senge, P.M. (1990) *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday Currency, New York.

Stewart, G.L., Manz, C.C. and Sims, H.P., Jr. (1999) *Team Work and Group Dynamics*, John Wiley and Sons, New York.

Strauss, A.L. (1987) *Qualitative Analysis for Social Scientists*, Cambridge University Press, New York.

Strauss, A.L. and Corbin, J. (1998) *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Tang, J. (2008) 'The effects of firm size on knowledge management in electrical and electronic manufacturing firms', *International Journal of Management*, Vol. 25, No. 2, pp.308–321.

Taylor, W.A. and Wright, G.H. (2004) 'Organizational readiness for successful knowledge sharing: challenges for public sector managers', *Information Resources Management Journal*, Vol. 17, No. 2, pp.22–38.

Triandis, H.C. (1995) *Individualism and Collectivism*, Westview Press, Boulder, CO.

Von Krogh, G., 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.

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

Wenger, E.C. (1999) 'Communities of practice: the key to a knowledge strategy', *Knowledge Directions*, Vol. 1, No. 2, pp.48–63.

Wiig, K.M. (1997) 'Roles of knowledge-based systems in support of knowledge management', in J. Liebowitz and L.C. Wilcox (Eds.): *Knowledge Management and Its Integrative Elements*, pp.69–87, CRC Press, New York.