

# ENABLING KNOWLEDGE SHARING: CULTURE VERSUS TECHNOLOGY

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### Abstract

This paper reports the findings of an empirical research into the effects of culture and technology on knowledge sharing in a knowledge intensive organisation pertaining to the higher education sector. The study found a strong relationship between knowledge sharing and culture, but not technology. The case organisation tended to place a much greater emphasis on culture rather than technology in enabling and supporting knowledge sharing among its staff members. The paper suggested a series of plausible to alleviate the existing problems.

**Keywords:** knowledge sharing, culture, technology, case study.

# Enabling Knowledge Sharing: Culture versus Technology

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Suggested track: Knowledge sharing

## 1. INTRODUCTION

Knowledge is considered to be a key factor for achieving sustained organisational success in the new era (Devlin 1999, Drucker 1993, Stewart 1997). Yet, while the importance of knowledge for organisational success (or survival) is widely acknowledged, there is far less of a clear understanding about how to manage it towards accomplishing this end. Knowledge management (KM) is an emerging field of research and practice that aims to help businesses and organisations to manage and orchestrate their knowledge entities in such a way that will enable them to achieve and maintain a competitive advantage.

The role of culture and technology factors in KM is the source of major disagreement within the KM community (Holsapple, 2003; Edwards, 2004). At one extreme of this spectrum are those who consider that KM is all (or mostly) about culture. The frequent statement heard in this camp is that a good KM solution is 90% culture and 10% technology (Snowden, 2003). At the other extreme are those that see KM as being all (or mostly) about technology. The first view is largely driven by the interests of those wishing to privilege the role of people in organisations, the second by those wishing to sell KM as a concept of mostly tools and systems (Swan, 2003).

Studies and organisational initiatives in KM have up until now tended to focus much more on technology as complete KM solutions (Edwards et al., 2003). The presently converging KM perspective acknowledges that technology is a necessary enabling function of KM, but also recognises that KM is driven by people-orientated factors within the organisational environment. This calls for more research exploring the relationship between these two groups of factors in KM. In response, this research aims to address the issue by undertaking an exploratory case study of knowledge sharing, and the surrounding organisational culture and technology within an Australian higher education institution.

Using the conceptual model of knowledge sharing adapted from Handzic (2003) as a theoretical basis, the following two research questions were explored in this study: (i) How do the various cultural and technological influences outlined in the literature enable/facilitate or inhibit knowledge sharing?; and (ii) What is the nature of the relationship between the technological and cultural components influencing knowledge sharing? Existing literature alludes to an underlying tension between these two components. If this is so, where exactly does the tension lie? Can it be resolved? To our knowledge, no prior research provides any meaningful or detailed explanation as to why this friction exists or how to alleviate and/or eradicate it.

## **2. LITERATURE REVIEW**

### **Knowledge sharing**

A great deal of knowledge within organisations resides in the minds of its employees. To capitalise on individual knowledge, organisations need to turn it into organisational knowledge. Nonaka's (1998) SECI model describes organisational knowledge creation as a dynamic process involving a continual interplay between explicit and tacit dimensions of knowledge through processes of socialisation, externalisation, combination and internalisation. The model identifies socialisation as a mode that enables tacit knowledge to be transferred from one individual or group to another within the organisation. This concept is also found in some other process-orientated knowledge management frameworks under different names, including social learning, knowledge sharing, or knowledge transfer (Alavi and Leidner, 2001).

The assumption is that socialisation enables tacit knowledge to be transferred between individuals and groups through shared experience, space and time. Examples include spending time working together or in social meetings. Furthermore, knowledge sharing is considered to be one of the most challenging processes for a knowledge-based enterprise due to employees' possible reluctance to share what they know. Hence, it is suggested that, in its absence, the gap between individual and organisational knowledge can widen. It is also noted that knowledge sharing is the most susceptible process to the effects of various socio-technological factors (Ford and Chan, 2003).

To address the question of fundamental conditions for enabling knowledge processes, Nonaka and Konno (1998) introduced the concept of 'ba', a Japanese word for 'place'. They proposed that different types of ba act as promoters of different knowledge processes. Thus, the originating *ba* is suggested to promote socialisation. Socialisation within the originating *ba* provides a rich and meaningful platform for natural interaction to convey knowledge. Building on Nonaka and Konno's work, the Handzic (2003) conceptualisation of KM included a number of socio-technological enablers that facilitate knowledge processes, particularly the process of knowledge sharing. Organisational culture and technology are the main focus of this study.

### **Culture**

Culture is widely understood as a set of shared values, beliefs, customs, practices, principles and routines that underpin the behaviour of an organisation and its members, usually cultivated steadily over a long period (Arnott 2000, McDermott and O'Dell 2001). Many authors point out that organisational culture is not only a critical success factor for KM, but also the most difficult and important factor to address, particularly if the appropriate culture does not already exist (Davenport et al, 1998).

Among the various components of organisational culture suggested to be important to knowledge sharing are: trust, common sub-cultures, vocabularies, frames of reference, meeting times and places, broad ideas about work, absorptive capacity, belief that knowledge is a common advantage, openness to other people's views, tolerance for mistakes and need for help. Other aspects of the organisational culture relevant to promoting informal knowledge sharing include knowledge fairs, open forums and chat rooms (Ford and Chan, 2003; Handzic and Agahari, 2003).

## **Technology**

From the personalisation perspective on KM (Hansen et al. 1999) the main role of technology is seen in enabling and facilitating interaction among people for the purpose of knowledge sharing. The aim is to create a connected virtual environment for knowledge exchange by allowing knowledge seekers to identify and communicate with knowledge sources (Handzic and Hasan, 2003). The Interim Australian KM Standard (Standards Australia, 2003) recommends several types of technologies for consideration by organisations when developing KM solutions that support virtual socialisation including e-mail, bulletin boards, chat-rooms, whiteboards, audio and video-conferencing. They also cover various specialised groupware applications, and integrated portals, intranets and extranets.

A comprehensive survey of best KM practices (AA, 1998), reveals that most organisations implement some kind of technology to connect people and enable their interaction and collaboration. However, there are differences among researchers regarding the value of virtual (technology-mediated) interaction in comparison with real (face-to-face) interaction in knowledge management. Some researchers warn that technologies lack the emotional richness and depth of real, live, in-person interaction (Santodus, 2001), and are unable to fully develop relationships and an understanding of complex situations (Bender and Fish, 2000). Others argue that communication mediated by technology is no less effective than face-to-face communication (Warkentin et al. 1997). More and more cyber-communities are also beginning to challenge traditional ideas about communities' needs for a physical presence.

## **Conceptual Model of Knowledge Sharing**

More recently there have been attempts to bridge the existing artificial divide between culture and technology-orientated perspectives of KM. The argument is that human culture is, at least in part, formed by our capacity to create and use tools. Therefore, ignoring technology would be foolish, as would be denying human complexity (Snowden, 2003). One consequence of the on-going polemic is the creation of an integrated view that considers KM as a socio-technological phenomenon with both technology and people playing an important role. Another consequence is the

generation of a contingent view of KM that links the relative emphasis on either people or technology to the nature of a business context. Essentially, the contingency view suggests that no one, single approach is best under all circumstances (Handzic and Hasan 2003).

Taking the view that both culture and technology have a role to play, a conceptual model of knowledge sharing shown in Figure 1 is proposed as an underlying theoretical framework for this study. The model (adapted from Handzic, 2003) proposes two factors: *organisational culture and organisational technology* as major enablers that facilitate the process of *knowledge sharing* within the organisation. The model also suggests the dependency of technology on culture. The main objective of the current study is to empirically examine these relationships.

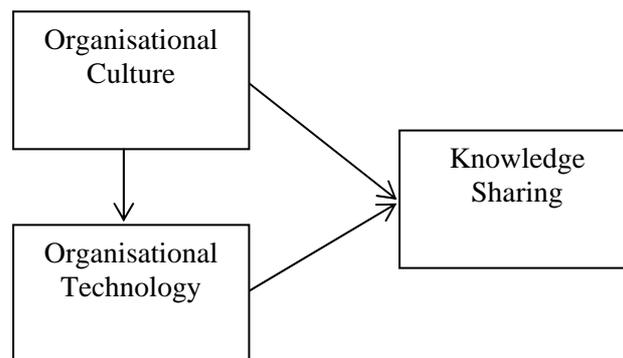


Figure 1: A Conceptual Model of Knowledge Sharing

### 3. RESEARCH METHOD

The current research was conducted using a case study method because it allows the phenomenon of interest to be explored in a natural setting, facilitates exploratory research, and enables deeper understanding of complex situations (Yin, 1994). The case organisation selected was a highly renowned and respected tertiary and research institution established in the university community in 1991. University schools, although knowledge intensive organisations that can greatly benefit from KM initiatives, have received relatively little attention from researchers compared to profit-making corporate organisations.

The subjects were 32 out of 36 possible staff members who participated in the study on a voluntary basis. The rate of 89% ensured that the sample was representative of the school. Out of 32 participants, 50% were teaching staff, 31% general staff, and 19% student services staff. With respect to the length of employment, 50% of the participants were employed by the school 5-10 years, 38% 1-5 years, 6% less than 1 year and the remaining 6% for more than 10 years. Such a distribution indicates that participants were familiar with their working environment.

The data collection was conducted by multiple methods. The methods were both quantitative and qualitative and included a general questionnaire followed by staff interviews, collection of school documents and direct site observations by one of the researchers. The questionnaire contained 19 statements relating to the research model: organisational culture (9), organisational technology (6) and knowledge sharing (4). Respondents were asked to evaluate each statement on a scale from (1) strongly disagree to (5) strongly agree. The questionnaire employed was based on similar instruments previously tested and used in the KM literature (Oliver et al., 2003). Modifications were made to reflect the unique nature and specifics of the organisation being studied.

Follow-up interviews with 7 staff members were conducted and audio-taped with the aim to probe for culture-revealing elements as suggested by McDermott and O'Dell (2001). In addition, the school made available its existing documentation including agendas, minutes, action points, plans, reports and other records related to the school's structure, mission, principles and values. These were further supplemented with the researcher's own site observation notes taken during regular working hours over a period of 2 months.

Data analysis was done in several steps. First, a quantitative analysis was carried out of the questionnaire responses using statistical analyses. Then the qualitative analysis of interviews, documents and the researcher's diary was performed to identify, code and classify main themes from the recordings. The themes derived fell into cultural, technological or sharing issues.

## **4. RESULTS AND DISCUSSION**

### **Quantitative Analysis and Results**

A descriptive analysis of data was performed as suggested by Miles and Huberman (1994) to identify prevailing patterns and ensure plausibility of findings. In order to identify a central tendency in participants' perceptions, the average scores of their responses to relevant questionnaire items were calculated. Overall mean results of 3.59 (out of 5) for sharing, 3.80 for culture and 2.91 for technology indicate high results for the importance of sharing and culture, and low results for technology within the school.

Further analysis of responses regarding knowledge sharing revealed that keeping up to date was the most important aspect of knowledge sharing, with the mean score of 4.22. It was followed by sharing novel ideas (3.88), freely voicing opinions (3.81), and willingly share knowledge (3.28). These results clearly indicate that employees were actively engaged in discussions and kept abreast of various issues relating to their work.

The highest rated culture-orientated factors contributing to sharing were organised meetings (4.19) and an atmosphere of openness, friendliness and trust (4.03). The school's culture was also found to engender confidence (3.95), promote a sense of community (3.88) and facilitate interaction between employees (3.84). The participants were somewhat unsure with respect to the role of knowledge valuing (3.34) and organisational structure (3.19) in promoting sharing. Finally, the results for

management support (2.97) and strategy (2.91) were not pleasing. These results indicated that the knowledge sharing culture in the school was a product of willing and trust-worthy employees rather than formal management strategy.

The average score for technology indicated its low overall influence on knowledge sharing within the school. However, providing connectivity (3.91) and supporting collaboration (3.47) were rated somewhat important. All other aspects evaluated rated in the lower categories including ease and efficiency of use (2.91), support for use (2.78), actual use (2.38) and intranet capability (2.00). These results indicate that the school's technology did not provide sufficient support for knowledge sharing among the staff. This, in turn, resulted in the low level of technology adoption by the school's employees for the purposes of sharing knowledge.

To further investigate the relationship between culture, technology and sharing, correlation coefficients were calculated between these factors. Not surprisingly, the high correlation coefficient of 0.71 (sig. at 5%) was found between culture and sharing. This result indicates that organisational culture heavily affected knowledge sharing. In contrast, technology had no significant influence on the sharing of knowledge, as indicated by a low correlation coefficient of 0.07 (n.s.). The results are also insightful in that they indicate that the support of knowledge sharing with technology is not likely to be influenced by culture, but rather by usefulness and convenience of that technology (Edwards, 2004). This study found no significant correlation between culture and technology (0.10, n.s.).

### **Qualitative Analysis and Results**

Qualitative analysis of the collected data further confirmed that the level of interaction and the sharing of knowledge occurred reasonably efficiently within the school, particularly in the student services office. For example, it was observed that services staff were; very keen to talk about tasks to accomplish, ensured that all employees were comfortable with set projects, and provided reassurance that help was always available should it be required. School documents also revealed that many knowledge sharing initiatives were proposed, although the interview participants revealed that they were not fully implemented in practice. In general, the interviews concurred with other findings that knowledge sharing was occurring at a reasonable level within the school.

It was also recognised that the school exhibited an enviable 'communal' culture with an extremely high level of openness and trust. The typical interview responses included: 'we all feel a part of the big family', 'people get along with everyone else', and '[other people] are amazed at the level of friendliness and trust within the school'. However, some reservations were expressed regarding the attitudes of senior academics who were seen as 'scared of losing the power that knowledge affords them', and 'need to make a better effort' to share knowledge. The observation notes indicated that a high value was placed on informal meetings such as morning teas, BBQs, lunches and evening drinks as a forum for sharing ideas. Such opportunities for informal knowledge sharing were found to play a key role in promoting organisational creativity (Handzic and Chaimungkalanont 2003) and effective social learning (Hasan et al. 2002).

Overall, and contrary to findings by Handzic et al (2001), these results clearly indicated that it was, indeed, possible to build a knowledge sharing culture in a university environment where a knowledge hoarding culture had traditionally reigned. However, there was a general feeling expressed that more could be done. This was particularly true with respect to the more formalised ways of purposeful sharing, and management setting a better example. Regular staff retreats and brainstorming sessions were suggested by several interview participants as valuable opportunities for collaborative work and improvement of the school's operation and performance. In addition, there was a call for addressing the lack of practical measures for encouraging sharing and collaboration in the school's strategy that would effectively guide this process.

With respect to technology, the analysis found that the school utilised, or attempted to utilise, three main technologies in relation to their knowledge sharing activities. These were the Eudora e-mail system, WebCT, and a shared server. Technology was installed to facilitate communication and sharing among general staff, student services staff and the academics within the school. However, the quantitative analysis pointed out that technology was not a high priority for staff in terms of sharing knowledge and the interviews sought to uncover the reasons behind this.

The interviews revealed that e-mail was used on a regular basis to keep the staff up-to-date with the latest activities and events. In contrast, very few people used the shared server to obtain required knowledge. Instead, most employees simply approached other staff in person to request the required documents. When quizzed about the reasons why this may be the case, typical responses obtained were: 'there hasn't been any formal training to let people know what they can do', 'technology takes away personal relationships', and 'people are not technologically minded'. There was also an admission that the server was 'on a very rudimentary level'.

It appears that the lack of adequate functionality and literacy were the major inhibitors of greater reliance on technology for knowledge sharing within the school. However, the majority of the participants whole-heartedly agreed that the introduction of an 'open place' on the shared server would indeed benefit the school. Some of the views expressed were along these lines: 'to get away from routine e-mails and get people thinking', 'a scheme to which everyone can contribute'. There was less support expressed for using collaborative technologies such as groupware 'given the small group where time and distance are not an issue', and 'when we are so close and can easily talk in person'. Physical proximity and the richness of the face-to-face medium of communication were responsible for the lack of greater reliance on technology for collaboration within the school. In summary, the technology was viewed as a complement to the social methods. It was considered useful in situations when personal contact was not possible or feasible.

### **Other Implications**

Overall, this research uncovered a distinct preference for people over technology-orientated means of knowledge sharing in the case organisation. The four major reasons identified included: personnel-related, method-related, fear of technology, and technological promises vs. actual deliverance. Lack of common language between IT and non-IT personnel, use of technology for discussing personal matters,

unrealistic expectations from the technology, and forced use of new technologies were some of the most common problems identified.

In order to alleviate the existing problems, the study suggested a series of plausible actions. These include: organising face-to-face meetings with both IT and non-IT personnel on a regular basis to facilitate better understanding; considering the 'time' element involved, and the sensitivity of the knowledge to be shared; dealing with each situation on its merits (ie. the personality of the recipient); understanding that technology will not and cannot, no matter how advanced or sophisticated, eradicate all organisational problems; implementing technological packages suitable to the requirements of the organisation; organising training and education as to the benefits of technology; and ensuring that on-going technical support is provided.

## **5. CONCLUSIONS**

The main objective of this study was to examine the knowledge sharing management practices in a knowledge intensive organisation. Both qualitative and quantitative analysis of data performed point to a highly communal organisational culture as a major enabler of knowledge sharing within the organisation. The role of technology was found to be secondary. This could be potentially attributed to the early stage of the development and implementation of the relevant technological support. The study suggested a series of plausible actions to alleviate the existing problems.

## **REFERENCES**

- AA (1998) *Best Practices in Knowledge Management*, Arthur Andersen.
- Alavi M. and Leidner D.E. (2001), "Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues", *MIS Quarterly*, 25(1), March, 107-136.
- Arnott D. (2000) *Corporate Culture: The Insidious Lure of the All-Consuming Organisation*, American Management Association, New York.
- Bender S. and Fish A. (2000) "The transfer of knowledge and the retention of expertise: The continuing need for global assignments", *Journal of Knowledge Management*, 4(2), 125-150.
- Davenport T.H., DeLong D.W. and Breers M.C. (1998) "Successful Knowledge Management Projects", *Sloan Management Review*, Winter, 43-57.
- Devlin K (1999) *Infosense: Turning Information into Knowledge*, W.H. Freeman and Company, New York.
- Drucker P.F. (1993) *Post-Capitalist Society*, Harper Business, New York.
- Edwards J., Handzic M., Carlsson S. and Nissen M. (2003) "Knowledge management research and practice: visions and directions", *Knowledge Management Research & Practice*, 1(1), July, 49-60.

- Edwards J.S (2004) "Supporting Knowledge Management with IT", (forthcoming)
- Ford D.P. and Chan Y.E. (2003) Knowledge Sharing in a multi-cultural setting: A Case Study, *Knowledge Management Research & Practice*, 1(1), 11-27.
- Handzic M. and Hasan H. (2003), "The Search for an Integrated Framework of KM", chapter 1 in Hasan, H. and Handzic, M. (eds) *Australian Studies in Knowledge Management*, UOW Press, Wollongong, 3-34.
- Handzic M. (2003) "An Integrated Framework of Knowledge Management", *Journal of Information and Knowledge Management*, 2(3), September.
- Handzic M. and Agahari D. (2003) "A Knowledge Sharing Culture", *Proceedings of the Knowledge Management Aston Conference (KMAC 2003)*, Birmingham, 14-15 July, 31-41.
- Handzic M. and Chaimungkalanont M. (2003) "The Impact of Socialisation on Organisational Creativity", *Proceedings of the European Conference on Knowledge Management (ECKM 2003)*, Oxford, September 18-19.
- Handzic M., Parkin P. and Van Toorn C. (2001) "Knowledge Management: Do We Do What We Preach?", in Renaud, K et al. (eds) *Proceedings of the Annual Conference of the South African Institute of Computer Scientists and Information Technologists, (SAICSIT'2001)*, 25-28 September, Pretoria, South Africa, 191-196.
- Hansen M.T., Nohria N. and Tierney T. (1999) "What's your strategy for managing knowledge?", *Harvard Business Review*, 77(2), 106-116.
- Hasan H., Ali I. and Warne L. (2002) *Activity as a Unit of Analysis for Knowledge Management Frameworks*, Wollongong University Activity Theory Workshop, September.
- Holsapple C.W. (2003) "Knowledge and Its Attributes", in Holsapple, C.W (ed) *Handbook on Knowledge Management*, Springer, Berlin, Vol 1, 165-188.
- McDermott and O'Dell (2001) "Overcoming Cultural Barriers to Sharing Knowledge", *Journal of Knowledge Management*, 5(1), 76-85.
- Miles M.B. and Huberman M.A. (1994) *Qualitative Data Analysis*. Sage, London.
- Nonaka I. and Konno N. (1998) "The Concept of Ba: Building a Foundation for Knowledge Creation", *California Management Review*, 40(3), 40-54.
- Nonaka I. (1998) "The Knowledge-Creating Company", *Harvard Business Review on Knowledge Management*, Harvard Business School Press, Boston.
- Oliver G., Handzic M. and VanToorn C. (2003) "Towards Understanding KM Practices in the Academic Environment: The Shoemaker's Paradox", *Electronic Journal of Knowledge Management*, 1(2), Paper 13.

Santosus M (2001) *KM and Human Nature*, *CIO.com* “*In the Know*”, [http://www.cio.com/knowledge/edit/k121801\\_nature.html](http://www.cio.com/knowledge/edit/k121801_nature.html). [accessed 18/12/2001].

Snowden D. (2003) “Innovation as an objective of knowledge management. Part I: The landscape of management”, *Knowledge Management Research & Practice*, 1(2), 113-119.

Standards Australia (2003) *Interim Australian Standard: Knowledge Management, AS5037 (int)*, Standards Australia International Ltd., Sydney.

Stewart T.A. (1997) *Intellectual Capital: The New Wealth of Organisations*, Doubleday, New York.

Swan J. (2003) “Knowledge Management in Action”, in Holsapple, C.W (ed) *Handbook on Knowledge Management*, Springer, Berlin, Vol 1, 271-296.

Warkentin M.E., Sayeed L. and Hightower R. (1997) “Virtual Teams versus face-to-face teams: An Exploratory study of Web-based conference system”, *Decision Sciences*, 28(4).

Yin, R. (1988) *Case Study Research: Design and Methods*, Sage, London.