

AN ETHNOGRAPHIC STUDY OF KNOWLEDGE MANAGEMENT PRACTICES WITHIN AN AUSTRALIAN MARKET LEADER: AN ORGANIZATIONAL CULTURE PERSPECTIVE

Luke M.J. Davey¹ and Kerry London²

¹ School of Architecture & Built Environment Faculty of Engineering and Built Environment University Drive, Callaghan NSW 2308 Australia Tel +61(08) 9424 9808

² School of Architecture & Built Environment Faculty of Engineering and Built Environment University Drive, Callaghan NSW 2308 Australia Tel +61(02) 4921 5778

The construction industry is an integral component of the Australian economy. Efficient management within the industry is critical to its overall performance. In recent years much attention has been paid to the concept of knowledge management and its application to the industry. Action research has been applied within an ethnographic study of an industry market leader. Market leaders play a significant role in the adoption of new concepts and technologies and it is through their actions that new knowledge is created. Central to ethnography is its reliance on 'participant observation', as a primary mode of data collection allowing a unique perspective on values, beliefs and culture. Organizational culture influences the transferral of information and knowledge and is a key component within knowledge management frameworks. The ability to create and maintain knowledge is essential in the maintenance of a sustainable competitive advantage. Evaluating practices within a market leader provides insights into the contribution of knowledge management in maintaining this sustainability.

Keywords: action research, ethnography, knowledge management, organisational culture.

INTRODUCTION

Over recent years there has been an increasing focus on the importance of knowledge in organisations. Interest in knowledge and its subsequent management is not limited to one industry but affects society as a whole (ABS, 2001). Within Australia, the construction industry influences financial markets, policy makers and planners at all levels (ABS, 2003), therefore because of its national significance, any efficiencies or improvements can have wide reaching benefits to the economy. Knowledge management (KM) is one such mechanism to facilitate these improvements. Within the construction industry KM has become particularly important due to its project-based nature. Large volumes of knowledge are generated throughout the processes of planning design, construction and maintenance. Although much of the information is retained, through documentation processes (i.e. architectural drawings, legal documents etc.), knowledge is typically difficult to capture (Woo et al.. 2004).

Within the Australian economy the construction industry employs 7% of the nations workforce and represents 4.6% of the gross product of all industries (ABS, 2003). The

luke_mj_davey@hotmail.com

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industry's private sector is comprised of a top tier of market leaders, made up of 14 to 20 organisations. These companies each have an annual workload exceeding AU\$1 billion and as a group make a significant contribution to the industry and subsequently the Australian economy (Walker 2003). Market leaders play a significant role within the industry through the adoption of new concepts and technology and the reasons are twofold; firstly, as a market leader many of the techniques employed by the organisation will become more prevalent within the industry over time and secondly, they have impact on the industry by virtue of their supply chain footprint. Evaluating the KM practices within a market leader will provide insights into the contribution of KM in maintaining a sustainable competitive advantage.

For organisations to effectively manage knowledge they must "construct a culture and environment of participation and coordination in knowledge sharing" (Lehaney et al., 2004). Due to the dynamics of knowledge, organisations must ensure a management of change is built into the organisation if they are to remain sustainably competitive. Cartwright, 1999, states "the root of the term culture is growth in a supportive environment". It is to cultivate mind and body. Development therefore is the incorporation into the organisational culture of the essential elements of growth, learning, adaptability, flexibility and progressive change".

Knowledge within the Organization

The ability to create and utilize knowledge is intrinsically linked to an organisation's ability to maintain a sustainable competitive advantage. KM recognizes that two types of knowledge exist, namely tacit and explicit knowledge. Explicit knowledge is objective and rational and can be expressed in such forms as data, scientific formulas, specific actions and manuals. Tacit knowledge is however subjective and experiential and more difficult to formalize. Tacit knowledge takes the forms of belief, perspective, mental models, ideas and ideals (Nonaka, 1996).

"Knowledge is context specific, relational, dynamic and humanistic" (Nonaka et al., 1996). Knowledge is essentially related to human action. The creation of knowledge occurs through the dynamic interactions among individuals and/or between individuals and their environments. The development of knowledge through experience provides an historical perspective from which to view and understand new situations. An organisation creates and defines problems, generates new knowledge to solve the problems and then generates new knowledge through the action of problem solving (Nonaka, 2001). Connections are made between historical events in the solving of a new problem and over time this translates into experience (Davenport and Prusak, 1998). An understanding of human beings and the complex nature of human interactions is required in order to understand the theory of organisational knowledge creation (Nonaka et al. 1996). The values and beliefs of those that make up an organisation inescapably influence this experience, whereby people with different values and beliefs will perceive the same situation differently. Knowledge gatekeepers on the individual level and knowledge networks, such as guilds and networks, on the group level provide the frameworks that allow sharing and distribution of knowledge within an organisation (Walker et al., 2003, Woo et al., 2004).

"Each organisation has a value system that is determined by its task" (Drucker, 1995). The members of an organisation must believe that what the organisation is doing contributes to the community and society in which they belong (Drucker, 1995). Limerick et al., (1998) argue that an organisation's culture is a variable characteristic of an organisation and that it can, to a greater or lesser degree, be shaped and

managed. Corporate culture is a set of beliefs, assumptions and values shared by a majority within an organisation. The rituals, ceremonies, images and artefacts that express the organisational culture are supported by various structures and systems within the organisation (Limerick et al. 1998). The ability to change the behaviour of employees such that this culture and environment are created is often the key implementation problem rather than merely implementing technology (Lehaney et al. 2004). "The autonomous organisation as a viable, developmental culture is far better equipped to survive and develop itself in a competitive market than an organisation that does not function as a culture and is unable to adapt to changing market conditions" (Cartwright, 1999).

Information and Communication Technology

Information and communication technologies (ICTs) assist in enabling the development of KM practices within an organisation. These technologies provide many of the tools necessary to efficiently access, manipulate and process information (ABS, 2001). Within the construction industry these tools enable a fundamentally new way of working through;

- The re-evaluation of relationships,
- New opportunities in products and services,
- Improving efficiencies in production, and
- Improving the quality of the final product. (Finch, 2000)

Current ICTs provide an ideal medium for the storage, distribution and retrieval of explicit knowledge sources such as manuals, however there is concern that these technologies do not provide adequate access to tacit knowledge. "Technology does not solve contextual problems" (Lehaney et al. 2004). Nonaka et al. stresses a need for a balance of both tacit and explicit knowledge in order to maintain a sustainable competitive advantage.

Blundell 1999 outlines the difficulties when implementing IT improvements within the construction industry as follows:

- The issues involved with implementing an IT strategy embrace planning, selecting software and solutions, rolling out systems and supporting them once they are in place.
- Planning issues embrace the implementation strategy, process change, setting up the project team, seeking integration, sequencing the introduction of new systems, defining time-scales and resources, and managing applications.
- Selecting solutions issues embrace specifying systems, choosing between bespoke and packaged solutions, selecting suppliers and packages and software development processes.
- Issues in rolling out systems include auditing skills, preparing data, training and user consultation.
- Support issues include help issues and user groups.

Many of these issues relate directly to softer management issues and ultimately will be impacted by organisational culture, thus highlighting the link between effective KM implementation and organisational culture. It is for these reasons that Blundell

highlights that "technology development happens more quickly than our ability to implement and apply the technology".

Within Australia, Walker (2003) has undertaken the most comprehensive study relating to KM within the Australian construction industry. This study has primarily involved the analysis of ICT diffusion through multiple case studies involving 'top tier' construction organisations. These case studies outline Australian construction companies that have embraced ICT as a tool for more efficient management practices within their project teams. Individual characteristics; supporting management factors; technology characteristic factors; and the influence of workplace environment have been identified as impacting the efficient implementation of these KM strategies.

The unique perspective gained through action research and ethnographic methodologies distinguishes this study from Walker's study, in that his investigation was an external analysis of multiple cases. This study has the researcher being directly involved in the development and diffusion of knowledge within a market leader of the Australian construction industry. The following section outlines these methodologies.

METHODOLOGY

A combination of action research and ethnographic methodologies are used within this project. A single organisation has been used as a case study.

Groat and Wang (2002) describe ethnography as having the following characteristics:

- a holistic exploration of a setting using context-rich detail
- a reliance on unstructured data
- a focus on a single case or a small number of cases, and
- data analysis that emphasises "the meanings and function of human action"

The distinctive attribute of ethnography is its reliance on "participant observation" as the primary mode of data collection. Central to ethnographic work is the concept of culture, which encompasses the beliefs and values shared by the members of the group of study. These values and beliefs guide the actions undertaken by the group (Rossman, 1988) "Become a member of a community, engage in its practices, and you can acquire and make use of its knowledge and information. Remain an outsider and these will remain indigestible" (Brown and Duguid, 2000).

"One of the reasons that we find knowledge valuable is that it is close - and closer than data and information - to action" (Davenport and Prusak, 1998). It is these actions that ultimately lead to the development of further knowledge and thus, action research methodology has been employed within this study to develop not only the knowledge base of the research community but also the participant organisation and subsequently the construction industry as a whole. Stringer (1986) describes action research as a cyclical process involving a "look, think, act" routine, whereby:

Look - Gather relevant information (Gather Data)

- Build a picture: Describe the situation (Define and describe)

Think - Explore and analyze: What is happening here

- Interpret and explain: How/why are things as they are?

Act - Plan (report)

- Implement
- Evaluate

The researcher is employed by the participant organisation, which forms the case study, in the role of architectural research graduate. The role of architectural research graduate is to carry out all research, information collection and the dissemination of technical issues as directed by the technical committee. The technical committee is a national directive, with a national committee and sub-committees in state divisions. This committee is responsible for maintaining technical information within the organisation; tacitly it is a KM initiative. Action research involves implementing actions that change existing programs and practices, and the subsequent analysis of what happens (Rossman, 1998).

Actions are performed within a '*real time*' industry setting allowing feedback to contribute to the development of further actions. This provides the researcher a unique position to observe corporate culture, which would not be as accessible to an outsider. Procedures associated with the implementation of the research methodologies, outlined above, occur within the researchers' workplace and involve:

Looking: The collection of the following forms of data:

- public documents such as annual reports
- minutes from Technical Committee meetings conducted within the participant organisation
- journal entries made by the researcher

Thinking: the organisational culture and the KM initiatives occurring within the organisation are observed and documented. The situation is interpreted based on the data collected and reviewed academic literature.

Acting: The use of action research as a methodology within the project enables the researcher to develop and initiate actions within an industry setting. These actions are directed by the needs of the participant organisation and are formulated within the researchers' role of Architectural Research Graduate. These actions are in turn documented through a journal and contribute to the cyclical development of the organisations KM framework.

Two main stages can be identified within the research project. Each stage has different participant requirements as outlined below:

Stage 1: It is anticipated that this stage will occur for the first 9 months of contact with participants. Two types of participants can be identified within this stage. The first participant group is comprised of the participant organisation, which is being treated as a collective. Collectives are distinguished by:

- Recognition of common beliefs, values, social structures or other enduring features that identify them as a separate group;
- Customary collective decision making in accordance with tradition and beliefs;
- It being customary for leaders or identified members of the collective to express a collective view; and
- Members of the collective being aware of their common activities and common interests with other members (NSECRIH, 2002)

The participant organisation has been selected because it is a market leader within the Australian Construction industry. The organisation has an annual workload exceeding AU\$1 billion, making a significant contribution to this industry sector.

The second type of participant is the participant employee; these are those employees directly involved in actions performed by the researcher within the role of architectural research graduate.

This stage is purely observational with individual participation being limited to regular work duties. Interviews will not be sought during this stage

Stage 2: It is anticipated that this stage will occur during the second 9 months of contact with participants. The observational techniques used in stage 1 of the project will continue in conjunction with a series of interviews. This stage will interview people at two levels within the participant organisation; those who are able to identify KM policies and those who are involved in KM initiatives. The assessment processes for this stage are yet to be developed, as stage 1 needs to be completed in order to inform this interview process. The following section reports the preliminary results from stage 1.

RESULTS & DISCUSSION

Case Study Background

The participant organisation is a market leader within the Australian construction industry. It has offices in Sydney, Melbourne, Brisbane and Perth. The researcher is based in the Perth office which is the newest office following the acquisition of a local development firm in 2001. The organisation originated in Sydney and it is this office that remains the head office nationally. Due to the 'young' nature of the Perth office there was a desire by senior management to transfer organisational information and standards from existing offices to the operating structures of the new office. This forms a key driver in determining actions performed by the researcher in the role of architectural research graduate.

The case study is unique within this industry primarily due to its organisational structure. The majority of firms within the industry provide services for one particular aspect of the industry, such as construction organisations, architectural firms, etc. The participant organisation is composed of four divisions that deal with the development of construction projects, these being; development, construction, sales & marketing and the architectural division. The participant organisation also has other divisions which deal with investments and hotels; however these are beyond the scope of this particular research project. This unique structure provides the opportunity to capture and transfer knowledge across the lifecycle of project development, more effectively than would be the case in organisations which provide services for one particular aspect of the development process.

KM practices have been employed within the organisation, although not directly referred to as KM, throughout the life of the organisation. The infrastructure required to support and maintain the implementation of KM within an organisations includes such things as a "database, or knowledge bank of technical options, standard details, simulations and sources of expertise etc." (Gann, 2000) and like many other organisations within the industry, the Case Study has the following infrastructure in place:

Design Principles and Checklists - These guidelines focus on a particular component of the development process, e.g. internal wet areas, and provide a detailed list of design recommendations. Checklists are used by the project development team to ensure that these principles have been met.

Problem Materials Database - This database has arisen due to re-occurring problems with particular materials. The database lists a problem material, its associated problems and recommendations for appropriate use.

Technical Bulletins - These bulletins are released as a result of problems occurring within a project; they outline the background of the particular problem and provide recommendations for future actions in response to the problem.

Standard Details - Due to the product focus of the organisation there is commonly re-use of detail drawings between projects. This has resulted in a series of standard details that incorporate known methods of construction.

Design Manuals - These manuals outline design strategies for the entire standard product produced by the organisation. These manuals contain information such as design responses to particular lots sizes and the associated building footprints. These manuals will often assist in determining the viability of a particular project.

Technical Specifications - These provide instructions to contractors and sub-contractors on how work is to be produced and the required level of quality,

Materials Standards and Testing Protocols - This is a database primarily concerned with stone and ceramic products and specifies the stain testing procedures along with previous results.

All of this information is contained within a national intranet and is accessible to all employees. Information has traditionally been categorised within this intranet under regional divisions, however there has been a recent move to nationalise information so as to improve consistency. This transferral led to a degree of confusion as there are currently both regional and national documents. Within the Perth office, due to its relative 'youth', this confusion is often exacerbated as there is limited local knowledge in relation to the information's relevance given a particular situation. To further compound the situation the information contained within the intranet is difficult to navigate and lacks a concise structure. Work is currently being conducted with the aim of resolving these problems through the development of a unified national structure accessed via a more efficient intranet.

The infrastructure outlined above represents primarily explicit knowledge, however much of this knowledge has been developed and converted from tacit knowledge. Knowledge is created through interactions among individuals, with different types and contents of knowledge (Lemon & Sahota 2004). Within the Case Study tacit knowledge is typically transferred through a variety of personal interactions. The most common of these are email communications and these occur on a day to day basis. Clarification may be sought on information found within the knowledge infrastructure or advice on how to tackle new problems may be sought from knowledgeable individuals. Commonly the researcher is called upon to perform this communication and serves as a knowledge gatekeeper due to the personal networks developed within the role of architectural research graduate.

Although email communications provide an invaluable resource, in the transferral of knowledge, the most effective transferral occurs when individuals visit from other

offices. Visits by the national product manager and national services coordinator typically occur two to three times per year. These individuals provide an invaluable resource due to their wide breadth of product knowledge and the transferral of this knowledge is most successful when situations can be discussed 'face to face'. It is through the 'social conversion' process that tacit and explicit knowledge expands in terms of both quality and quantity. To remain competitive organisations must not only effectively create and efficiently organise their knowledge and expertise they must also continually replenish it (Lemon & Sahota 2004). Lemon and Sahota term this replenishment the dynamic capability of the organisation and directly relate it to an organisations ability to innovate and learn.

The development of an infrastructure to support and maintain the implementation of KM is of crucial importance (Gann, 2000). The employment of the researcher as an architectural research graduate is part of an explicit strategy to improve KM; through this role, the development of both explicit and tacit knowledge has been facilitated. The entire KM infrastructure outlined above has been directed by senior management and this supports the idea that management has a direct role in providing the necessary elements for a KM system to operate (Lehaney et al., 2004). In addition to this management also commonly support personal development of staff through the organisation of regular training sessions commonly provided by external sources such as management institutions.

Experience has shown that within the organisation there is a strong desire to maintain a high level of quality within the development product. Individuals are willing and in fact keen to transfer this knowledge. Information is often sought from senior management within the organisation who, due to their high level, would have a high investment in the organisations product. Experience has also found that even those not involved in senior management are willing to share information and express a 'belief' in the product. This would suggest that there is a relatively healthy organisational culture which believes that the organisation is contributing to the community and society as required by Drucker (1995).

Action Research Initiatives

The results and discussion outlined thus far primarily represent the ethnographic component of the research methodology. Based on the need for a 'social conversion' process in the development of knowledge, a series of sessions were developed by the researcher to produce local standard details. This process represents the action research component of the methodology. Developing standard details was a direct response to management requests for national techniques to be incorporated into local practices. The variability between construction practices around Australia required standard details to be localized. National standards provided the benchmark for quality whilst local techniques and knowledge determined the viability of national standard details. The process undertaken involved a series of 'roundtable' sessions between members from the architectural and construction departments within the local office. The researcher sourced details and technical information from national standard details, previous projects, technical bulletins and Australian Standards. This information was collated into the appropriate groupings and sessions were run on selected areas (e.g. pre-cast concrete). Sessions involved the distribution of a 20-30 page document where participants were instructed to 'mark up in red' alterations or points for discussion on the information contained therein. Participants were given a week to perform this task after which the documents were recollected by the researcher. The 'mark-ups' were then transcribed by the researcher to a digital copy of

the detail document. All comments were initialled so as to indicate the author. A week following the return of the document to the researcher, a meeting was established between the participants at which time marked-up booklets were re-issued to the participants. The researcher then went through a "PowerPoint" presentation containing all the participants' comments, discussing each of the comments within the group and establishing a general consensus within the group prior to moving to the next slide. This consensus was noted by the researcher and represents a form of verbal agreement between all participants. Following the 'round table' session the researcher compiled the resolved details into the appropriate section and developed a standard detail manual. The standard detail manual represents the company's level of quality and is reflective of both local and national requirements.

In order to ensure the standard details remain current a review process has been established whereby users of the manual are asked to submit alterations and additions to the researcher. These alterations and additions are then reviewed quarterly by the researcher, a Design Director and a Construction Director to assess whether these details should be included within the document. Original manuals are collected, amended and then re-issued with the new inclusions.

Recently the standard details, produced in the process outlined above, have been questioned due to a problem occurring within a particular development. Local practices replaced a national standard for two reasons; firstly there was ambiguity in the relevance of a particular technique used within a national detail, and, secondly certain individuals were more 'vocal' within the review process. The lack in local knowledge resulted in a detail which did not meet national standards and consequently these details are currently under review. This issue is however part of the learning process and highlights the difficulties associated with the transferral of knowledge. This is supported by Bresnen and Marshall's (2001) view that knowledge is highly socialised and influenced by psychological, social and political factors. Although knowledge can be transferred to some degree there is no substitute for experience.

CONCLUSION

The ability to create and utilize knowledge is intrinsically linked to an organisation's ability to maintain a sustainable competitive advantage. This paper represents the preliminary findings from stage 1 of a Master's dissertation. Through the action research and ethnographic methodologies employed within this study, the researcher has been able to gain a unique appreciation of the KM framework, within a market leader, whilst developing personal networks that inform the cultural influences impacting on the development of this framework. Interviews conducted in stage 2 will examine the organisation's view of KM, both from a managerial perspective and a working perspective, whilst continuing to contribute to the further development of KM within the organisation. Through 'participant observation' this research allows an analysis of the social, political and psychological influences that are inextricably linked to the humanistic qualities of knowledge transferral and ultimately the commercial sustainability of an organisation.

REFERENCES

ABS (2003) Year Book Australia 2003 – *Labour Employment by Industry and Occupation*, Australian Bureau of Statistics, Canberra.

- ABS (2001) *Measuring a Knowledge-based Economy and Society An Australian Framework* Australian Bureau of Statistics, Canberra, pp. 48.
- Blundell, Derek. 1999. *Implementing an IT Strategy in Practice. Appeared in Strategic Management of IT*
- Brown, John Seely. Duguid, Paul. 2000. *The Social Life of Information.* Harvard Business School Press. Harvard.
- Cartwright, Jeff. 1999. *Cultural Transformation.* Pearson Education Limited Great Britain.
- Davenport, Thomas H. and Prusack, Laurence. 1998. *Working Knowledge: How Organizations Manage What They Know.* Harvard Business School Press. Boston.
- Drucker, Peter F. 1995. *Managing in a Time of Great Change.* Butterworth-Heinemann Oxford.
- Finch, E. (2000) *Net Gain in Construction - using the internet in the construction industry,* Butterworth-Heinemann, Oxford.
- Gann, David M. 2000. *Building Innovation: Complex Constructs in a Changing World.* Thomas Telford Publishing. London.
- Groat, A. Wang, D. (2002) *Architectural Research Methods,* John Wiley & Sons, Inc., New York.
- Lehaney, Brian. Clarke, Stephen. Coakes, Elaine. Jack, Gillian. 2004. *Beyond Knowledge Management.* Idea Group Publishing. London.
- Lemon, M. Sahota, P.S. 2004. *Organisational culture as a knowledge repository for increased innovative capacity.* Technovation, 24, 483-498.
- Limerick, David. Cunningham, Bert. Crowther, Frank. 1998. *Managing the new Organization: Collaboration and Sustainability in the Postcorporate World.* Allen & Unwin. Australia.
- Nonaka, I. Umemoto, K. Senoo, D. 1996. *From Information processing to knowledge creation: A paradigm shift in business management.* Technology In Society, 18, No. 2, 203-218.
- NSECRIH, (2002) National Statement of Ethical Conduct for Research Involving Humans, Commonwealth of Australia, Canberra.
- Nonaka, I. (Ed.) (2001) *Managing Industrial Knowledge - creation, transfer and utilization,* Sage Publications Ltd., London.
- Stringer, E. T. (1986) *Action Research - a handbook for practitioners,* Sage Publications Ltd., London
- Walker, H.T. Peansupap, V. (2003) *Innovation Diffusion Through Strategy and a COP Approach – An Australian Construction Case Study,* Paper presented at ANZAM, Perth.
- Walker, D. Goldsmith, P.W. Peansupap, V. and Wilson, A. (2003) *Factors Affecting Information Communication Technology Diffusion – An Australian Study,* Paper presented at CIB conference, Singapore.
- Woo, J.-H., Clayton, M. J., Johnson, R. E., Flores, B. E. and Ellis, C. (2004) *Automation in Construction,* **13**, 203-207.