An Investigation into the Tacit Knowledge Transfer Process in an Open Plan Office Environment

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An Investigation into the Tacit Knowledge Transfer Process

in an Open Plan Office Environment

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Abstract:

The research described in this article aimed to investigate the link between the internal organisational layout and its impact on the tacit knowledge transfer process in an open plan administrative working environment. In recent years academic literature in the area of Knowledge Management has concentrated on the management of knowledge within the organisation with particular focus placed upon management systems and the introduction of knowledge measurement tools.

The value of this research lies in the identification of barriers to knowledge transfer within an open plan working environment and subsequent alignment of strategic goals in order to overcome these barriers.

This summary is based on the research completed as part of the author's Masters Dissertation. The literature reviewed provides a comprehensive overview of current academic research published both in the core topic of knowledge management but also on organisational design. The links and gaps in the literature between these two areas are highlighted and form the basis of the research questions posed.

An online questionnaire was used to collect primary data in response to the research questions developed. The research was undertaken in environments where the respondents work in an open plan environment and in order to obtain honest feedback and responses, an anonymous questionnaire was chosen. The participants worked for a variety of industries and office environments. A 62 per cent response rate on the questionnaire resulted in an acceptable level of responses for the subsequent analysis and the study concludes by outlining the limitations to the research and makes recommendations for future research.

Key words: tait knowledge; codified knowledge; organisational design; work-space design

1.   Knowledge and Knowledge Management

Knowledge and Knowledge Management (KM) can be difficult to define, and many interpretations exist. Knowledge can be represented in and is often embedded in organizational processes, outlines, networks and documents, but this first originates within the individual: Knowledge is what the

'Knower" knows, and it can be argued that there is no knowledge without someone knowing it (Fahey and Prusak, 1998).

Organisations tend to view knowledge as an external process - as something that can be defined, documented, measured and managed via a database. This retracts from the concept put forward by a number of authors in this area that knowledge originates internally within the person and is processed, internalised and improved upon by the individual (Fahey and Prusak, 1998).

Although there is no universal understanding of what knowledge itself is or what it refers to, the definition as outlined by Davenport and Prusak (1998) serves as a useful working definition. "Knowledge is a mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information". Knowledge can often be mistaken for data or information. Sun (2010) notes that knowledge is the level of understanding arrived at after raw data and information have been both interpreted and internalised.

Once an understanding of what knowledge is has been established, it is important to define what areas are covered by the body of knowledge known as Knowledge Management (KM). KM can be seen as an umbrella term for a wide range of academic areas which include information systems, organisational learning, strategic management and innovation (Alvesson and Karreman, 2001). As a body of research, it is multi-faceted phenomenon within the organisation and resides within people, technologies, and also in physical items such as documents, processes and procedures (Xu et al. 2010).

Wiig, while researching how artificial intelligence [AI] could enhance learning, creation, sharing and leveraging intelligence for the organisation as a whole, first coined the term "Knowledge Management" in 1986. Further research published in 1990 solidified KM as a body of research in itself. Sveiby (1990) explored KM from an organisational strategy perspective. Sveiby's research made reference to "Knowledge Workers" within the organisation and concentrated in particular on the use of strategic HR management to maximise the benefits from the "Knowledge Workers". Sveiby's work developed a competence-based strategy and in 1989 published a knowledge based theory of "Knowledge Capital" proposing measurements of evaluating an organisations knowledge or intellectual capital.

Nonaka and Takeuchi's 1994 research published in the area of knowledge creation and innovation can be linked to Sveiby's research on knowledge capital. It is recognised that employees hold high volumes of knowledge internally which can prove beneficial for organisations. Subsequent publications in the 1990's by Nonaka presented the SECI Model, alternatively referred to as the Knowledge Spiral because as information is understood, the knowledge becomes embedded and the process starts again. This model, so-called the "SECI" model stands for the Socialisation, Externalisation, Combination and Internalisation of knowledge within the individual. It proposes that knowledge learning and development within an individual is a continuous process. Tacit knowledge sharing amongst employees occurs during the Socialisation phase of this model where people communicate directly with each other to express what they know.

Swan et al. (1999) views KM as any process relating to the creation, acquisition, capture, sharing and use of knowledge, skills and expertise. Levinson (2010) agreeing with Swan et al. (1999) that KM is a process, states that KM is a process through which an organisation generates value from its intellectual and knowledge-based assets. Alternatively, Thompson and Walsham (2004) view KM not as a process but as a function focusing on organisational objectives with the aim to improve competitive advantage.

Where knowledge is viewed as an object then the solution to managing knowledge is to invest in IT infrastructure, however if knowledge is viewed as a process by management then investing in employees and the management of their skills the management of personnel is the appropriate approach (Sveiby, 2001). Sveiby developed the idea of knowledge as a process into his knowledge-based strategy.

2.1 Knowledge Management Perspectives

Silver and Shakshuki (2002), although not referring to knowledge as either a process or an object, divides KM into two perspectives - technology-centred or human centred management - which echo Sveiby's view. The technology-centred perspective is based around the belief that knowledge can be encoded, stored, transmitted and processed by IT systems. The alternative perspective "Human-centred" management is developed from the areas of psychology, human development, cognition, organisational behaviour, group dynamics and sociology, where the belief that knowledge develops and evolves with human personality, intelligence, education alongside the organisational culture, norms and routines.

Xu et al. (2010) promote the human resource management perspective noting that for KM to operate successfully and benefit the organisation the attention must centre on people and the human resources within the organisation using the physical aspect and technology is considered secondary to the human resource perspective. A trend in recent years has been to invest in technology as a method of utilising KM within the organisation forgetting that it is the employees whose interaction with the technology and systems employed will influence the extent to which these systems will succeed within the company.

Sun (2010) presented what could be considered a practical process of turning data into knowledge in three stages: 1) Data 2) Information 3): Knowledge.

Figure 1:   Sun (2010) Three Step Process to Knowledge

Source: Sun, 2010

These stages describe how data which has been entered into a data repository is turned into information as employees extract and begin to interpret the data. Finally this information becomes knowledge once understood, internalised and utilized. Stage three (Knowledge and Utilization) connects to the internalisation phase as outlined in Nonaka's Knowledge Spiral and can be linked to Tuomi's (2000) research on separation of knowledge from data. Segregating this information helps management and employees alike break information into a manageable format.

According to Sveiby (2001), IT and knowledge repositories and databases is a tool for information exchange, in itself, it can never drive change. IT evolves as the demands of the organisation and the method of information, or knowledge exchange develop. IT systems are developed and altered to solve problems which people have discovered- they don't solve problems that the company has not yet realised it has, as such; it is not predictive in nature. This contributed to the idea that although IT systems assist in the transfer process, they do not act alone and that employee interaction,

communication and knowledge sharing is required from both the information source and recipient to be successful.

Simply understanding the concept of knowledge and knowledge management is only the first step for companies, they must learn to recognise knowledge within their company and refine, harness and exploit this in order to be able to adapt to changing markets. The next step then is to attempt to codify this knowledge into a format from which is can be understood, refined and then shared or transferred amongst the company. This process aims to heighten the knowledge base of other employees, develop leaner processes and ultimately derive a sustainable competitive advantage for the organisation within their chosen marketplace.

2.2 Knowledge Management: Tacit and Explicit Knowledge

Following on from the views expressed above that KM can be viewed as a process or an object and the research in this area to-date has proposed a number of contradictory perspectives; knowledge itself can be drilled down further. Nonaka and Takeuchi (1995) divide knowledge into two specific areas: Explicit and Tacit knowledge. Explicit knowledge is knowledge that is quantifiable. It can be expressed, documented as procedure, applied and monitored by the organisation for its effectiveness in generating value for the organisation. Tacit knowledge is gained over time, influenced by culture, beliefs, experience, education, a persons' perception of the situation and also by common sense. It can also be referred to as information that has been interpreted (Tuomi, 2000).

The objective for Knowledge Managers is to identify tacit knowledge and turn this into explicit knowledge to share across the organisation. People may not recognise their tacit knowledge making it difficult for organisations to recognise and benefit from this knowledge. Simply put - we know more than we can tell (Polanyi, 1966). Tacit knowledge is derived from personal experience: it is subjective and difficult to formalize (Nonaka et al, 2000 as cited in Foos, Schum and Rothenberg, 2006). There are many barriers to knowledge transfer or sharing within the company and to avoid the loss of knowledge through this route, organisations employ a number of tactics in an attempt to retain knowledge within the organisation.

Stenmark (2001), in his research on the benefits derived from tacit knowledge transfer highlighted three reasons why organisations fail to benefit from tacit knowledge:

1. A lack of awareness of ones' tacit knowledge

2. For employees to carry out their job, it is not necessary to express their knowledge.

3. Tacit knowledge can be a unique selling point for an individual.

Once internal or tacit knowledge is expressed and understood in a format where it can be stored or contained in procedures or process manuals, online or in databases, it can then be utilised for the organisation as a whole. However, it is important to note that this data will not be turned into information and in turn into knowledge unless it is transferred in an effective manner. This format of knowledge transfer will differ across organisations and cultures.

2.3 Knowledge Management: Organisational Implications

The objectives of actively managing knowledge for management are to assist in ensuring the organisation acts as intelligently as possible to secure its viability and overall long term success (Wiig, 1997).

Traditional organisational focus for leadership based on operational excellence or product leadership has evolved and companies now have a greater integration with customers and organisational focus has switched to pursuing customer intimacy. Attention shifted from looking externally at competitors and market trends inwards to the skills held by staff, structures, culture and strategies. This shift in focus can result in organisations shifting their entire strategy and long term focus. KM is a complimentary management tool for each of the three principles of operational excellence, product leadership and customer intimacy regardless of which principle is being pursued at a given point in time.

For KM to work and for a system to be recognised as effective, it must be possible to measure and evaluate KM tools and activities employed within an organisation. Levitt and Guenov (2000) identified metrics for evaluating the effectiveness of KM which serve as a starting point for organisations to develop relevant measures to evaluate KM. These metrics include motivation tactics, knowledge capture, knowledge transfer, innovation, creative thinking, knowledge identification and access to knowledge. These serve as a starting point for management: KM must be measurable in order to evaluate its impact and success within the organisation.

Wiig (1997) divides KM into five areas of emphasis for management, each of these areas of KM impact the organisations overall strategy:

1. Top-down monitoring

2. Facilitation of knowledge-related activities

3. Creation and maintenance of knowledge infrastructure

4. Renewing, organising and transforming knowledge assets

5. Leveraging knowledge assets to realise their value for the company.

Winter and Szulanski (2001) investigated the strategy that is in operation on a global scale by large organisations: replication. Using tried and tested methods with explicit procedures and processes across the board. Unfortunately this strategy assumes that information is perfectly available and that routines are assumed to be perfectly replicated each time where little effort is required to maintain the requisite standard.

2.4   Why do Organisations choose to Manage Knowledge?

Sveiby (2001) raised questions over whether the benefits associated with actively managing knowledge for an organisation was to raise revenues, cut costs, and create knowledge or to increase organisational efficiency. It can be argued that KM can deliver all of the above. According to Sveiby (2001), long term benefits enjoyed as a result of effective KM includes fast decision making, a reduction in internal barriers within the organisation as opportunities to innovate are enhanced, quicker product development through greater interaction and finally customer relationships improve.
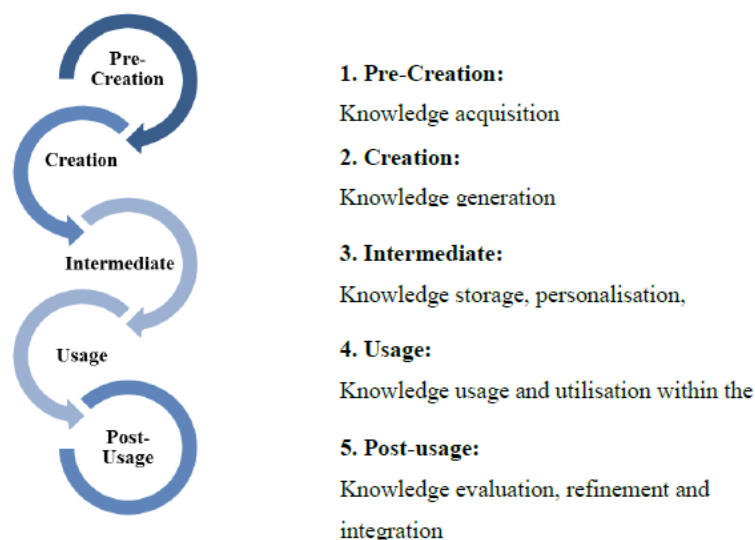
The resource based view of an organisation recognises that it is the employees who are the core asset within the organisation and it is because of the skills, experience and knowledge that they bring to the company that they are viewed as such. In order to gain and sustain a competitive advantage over competitors in their chosen market, organisations must exploit the knowledge of their workforce. KM is not simply a function within the organisation, rather it is something that crosses all departments and structural levels in the company. As knowledge is something that is both contained within each employee (tacit) and in written format (explicit) it will influence an organisation at strategy level and will filter right through to junior members of staff as they integrate and learn tasks.

As KM encompasses the activities of the entire organisation as a whole rather than specific department, management are extremely interested in looking internally to find methods of maximising resources and skills. Levett and Guenov (2000) recognise that central to KM is the idea that innovation is supported amongst employees, generating new ideas, capturing insights and fostering collaboration. Xu et al. (2010) place great emphasis on the importance of innovation and the strong links innovation has to knowledge and its management within the organisation; Knowledge must be shared, internalized, and reused to lead to innovation. Managing innovation is a challenge and so is managing knowledge. Core activities for innovation are knowledge usage and creation (Xu et al. 2010).

Nonaka and Takeuchi (1995) recognised the link between managing knowledge and innovation as a source of achieving a sustainable competitive advantage. Xu et al. (2010) pointed out that turning knowledge into innovations profitable for organisations on a continuous basis is a major concern for organisations. It could be argued that the recognition by management of the importance of exploiting their employees' knowledge and the innovations derived from this can be seen as a pivotal driver in investment into technology and software for storing and managing data.

Xu et al. (2010) propose a Meta-Model of KM for continuous innovation. As they note that innovation and KM go hand in hand, this model serves as a good example of highlighting where knowledge transfer takes place. Xu et al. developed a Knowledge Life Cycle which links in with the Meta-Model. Knowledge sharing falls within the third and fourth stages of the cycle.

Figure 2: The Knowledge Life Cycle

1. **Pre-Creation:**
Knowledge acquisition

2. **Creation:**
Knowledge generation

3. **Intermediate:**
Knowledge storage, personalisation,

4. **Usage:**
Knowledge usage and utilisation within the

5. **Post-usage:**
Knowledge evaluation, refinement and integration

Source: Xu et al., 2010

Analysing the Knowledge Life Cycle is useful to highlight the phases that knowledge goes through within the individual. When comparing with Nonaka and Takeuchi's SECI model, the addition of an extra stage simply allows for further refinement of knowledge which has been internalised.

2.5   Knowledge Transfer: Why Transfer Knowledge?

Knowledge transfer allows employees to a deeper understanding of knowledge firstly through the codification of knowledge. Secondly, the process of recognising, articulating and expressing this to facilitate knowledge transfer across the organisation provides a deeper understanding. Grant (1996) promotes the idea that if knowledge is considered critical for success, then the primary role of the firm is the integration of knowledge. In practical terms this involves the integration of specialised detailed knowledge across a number of departments with a broad range of skills to create value by turning inputs into organisational outputs.

2.6   Knowledge Transfer: Difficulties

A difficulty in transferring knowledge lies in the general "sticky" nature of the Knowledge itself. This refers to the difficulty in transferring knowledge (Szulanski, 1995). The level of "stickiness" is impacted by the context, complexity of the task, credibility of the source, the ability of the recipient to understand and interpret the information (Arrow, 1971 as cited in Szulanski, 1995). Arrow (1971) describes further the use of a Communications Metaphor where it is suggested that the credibility of the source and the ability of the recipient will impact the success rate of the transfer process.

Additionally, the organisational context may affect the process: Formal structures, systems, co-ordination and expertise can influence the transfer of knowledge (Ghoshal and Bartlett, 1994). Hislop (2003) as cited in Lin (2007) found that the success of KM is heavily dependent on the willingness and ability of the workforce to share knowledge and the organisations commitment to the process.

Reward systems linked to knowledge sharing are an effective method for management in overcoming a reluctance to share knowledge. Recognition of expertise strengthens an employee's sense of belonging to the organisation, deepens their own understanding of the knowledge. Hislop (2003) in Lin (2007) emphasises that the willingness for employees to share their tacit knowledge

has a significant bearing on the transfer process; Fostering an environment or culture within the firm where KS is encouraged will assist in the facilitation of the process.

Foos, Schum and Rothenberg (2006) in their research of project managers reported that the idea of tacit knowledge transfer was poorly understood amongst managers- tacit knowledge itself, its content and the transfer process. This lack of understanding by management can prove detrimental to an organisation that actively tries to manage its knowledge and knowledge transfer.

In their research Gururajan and Fink (2010) noted through their research that there were four core attitudes to knowledge transfer;

1. *Trust:* Trust can facilitate or be a barrier to KT
2. *Absorptive Capacity:* The ability to apply knowledge can impact the transfer process
3. *Motivation:* Motivation of the source or recipient can influence the KT process.
4. *Knowledge Re-generation*: Once transferred, the knowledge must be reused.

The organisational culture can impact the KT process, employees who feel their role is vulnerable will seek to retain their knowledge internally in order to increase their "unique selling point" within the company. in the organisation and by retaining their knowledge, they increase their employability. The culture can impact how approachable employees are perceived to be.

2.7   Knowledge Sharing: A Knowledge Transfer Activity

Renzl (2008) as cited in Kumar and Ganesh (2009) remark that the terms "Knowledge Sharing" and "Knowledge Transfer" are used interchangeably in literature. Once the reasoning of why an organisation should manage its knowledge, the next step is to focus on how to manage knowledge. Mårtensson (2000) recognises that KM must have an organisational purpose if it is to turn knowledge into organisational gain. Therefore it is important for Knowledge Managers to extract tacit knowledge in order to converting it into organisational knowledge.

Management Tools and models can be used to identify knowledge, express it in a format where it can be shared throughout the organisation. These serve as tools for leveraging knowledge for organisational gain. Knowledge sharing can be referred to as an activity within the knowledge transfer process. Organisations have sought to harness and retain information within knowledge management systems, databases and online systems in recent years as they recognise the

importance of gathering and retaining this information not just within the organisation but to pass this information along to others: i.e. Knowledge Sharing. As noted, KM is not a linear process- if the SECI Model is taken into consideration; the spiral effect occurs where knowledge is processed deeper by the individual employee. The depth of tacit knowledge understanding and its subsequent transfer and benefit to the organisation is not easily measured.

The use of knowledge systems, databases or online real-time systems can prove effective at storing and accessing explicit knowledge. These systems store knowledge which is known; as a large portion of our tacit knowledge is unknown these systems cannot be used in this regard. These systems manage existing knowledge but new knowledge is generated as people share and gain a greater understanding of their job and workload – where people are unwilling to share what they know, a barrier to knowledge generation exists. Although many authors have spoken about the importance of knowledge management within the organisation for more effective management of the intellectual capital available within the company and that the use of KM within the company can lead to a sustained competitive advantage, the method in which knowledge is effectively transferred remains an area of considerable debate.

2.8   Knowledge Sharing: The Role of Communication

Murray and Peyrefitte (2007) concluded their research emphasising the importance of knowledge transfer for an organisation and communication channels should be chosen with consideration, the focus was on the communication process of KT; Tacit knowledge transfer methods included role playing and job rotation while email has shown to be a useful explicit knowledge transfer tool. Email can be over-used as a medium for communication and takes away from tacit knowledge sharing which could take place in a face-to-face environment depending on the internal layout of the organisation. Mentoring and role-playing can be both a tacit and explicit knowledge mechanism.

2.9   The Importance of Knowledge Transfer and Knowledge Sharing

Mayfield (2010) identifies four related and complementary activities which encourage knowledge sharing. These include formal reward schemes, development of a real time online "Wiki" where all relevant parties can both contribute knowledge learnt or recognised or benefit through knowledge shared by others in the online database, Town Hall meetings and mentoring. When viewed in

isolation, each activity fails to capture all knowledge and therefore a mutually beneficial integrated approach is the most appropriate.

If measurement techniques are not used to monitor these activities, then the level of knowledge transferred the rate of transfer or the results can't be measured. Informal knowledge sharing occurs on a regular basis but is dependent on the goodwill and motivation of the staff and management and available resources. Due to the lack of formal recognition, the level of knowledge transfer is unknown (Mayfield, 2010). In addition to Mayfield's knowledge sharing activities, a number of knowledge sharing activities impact internal tacit knowledge transfer including storytelling, routines and replication. Innovation and creative thinking can be stifled through excessive use of routines and replication of tasks. Kostova (1999) argued that adhering too closely to a template decreases the effectiveness of the transfer as it inhibits local adaptation.

2.10   Organisational Structure: Open Plan

West and Wind (2007) highlighted that the organisational design must fit with the context and industry. Where interaction is needed amongst staff, a fluid and open environment where staff can see and have access to both each other and the data needed to complete their jobs is needed, this fits administrative environments such as insurance, payments, settlements and shareholder services where multiple departments work on different elements of the same process. Interactive "hubs" or team work spaces are more suited for projects where direct interaction is necessary to move through the project. Offices operating an open plan policy try to foster an environment whereby people interact informally; this is a very effective and popular method of tacit knowledge transfer. An open plan office can be defined as one where walls and partitions have been removed and have been replaced with other instruments such as cubicles, plants and furniture to give the sense of separating departments and teams physically (Oldham and Bass, 1979).

Research into organisational design and the benefits of an open plan office versus a closed environment has highlighted several differences between them. The existence of offices has historically been viewed as a status symbol, and the trend towards open plan environments impacted the social structure of the organisation (Szilagyi, Holland and Oliver, 1979).

Drawbacks of an open plan office include increased noise, crowding, a lack of privacy, status and security, reduced productivity (Szilagyi, Holland and Oliver, 1979). The proximity of staff to each other and management allows employees to take in what is happening in their surroundings and to step into a situation necessary. The layout may provide employees with the means but not the privacy to complete their tasks (Stone and Luchetti, 2001).

This environment fosters informal knowledge sharing but may result in disenfranchised employees who feel their contribution is not recognised. Also, where a culture of informal sharing occurs, employees may spend time assisting colleagues rather than completing their own tasks with management failing to recognise their contribution to another colleague or department. As people turn to more experienced members of staff for assistance and support rather than seeking to solve difficulties themselves can prove problematic when these experienced colleagues leave.

The broad scope of literature on KM was narrowed to focus on areas such as the impact of culture in the KT process, the use of communication methods in the KT process, the difficulties and barriers associated with KT and sharing across the organisation. Finally the physical structure of the organisation and the layout and design of the office was recognised as an influential factor for management seeking to manage knowledge. These sections were refined into research questions noted below formed the basis for the primary research method and approach.

The following research questions have been formulated for further investigation:

- Is Knowledge Sharing assisted or impeded by the increasing tendency for organisations to favour open-plan office layouts?

- Is the culture encouraged by open plan offices beneficial to knowledge sharing amongst staff for organisational benefits?

- Is the tacit knowledge transfer impacted by the method of communication chosen?

3.   Research Methodology

3.1 Research Process Introduction

One of the core questions to be addressed at the outset of any research project is the research approach to be adopted. Research conducted for organisations or into problems faced by organisations tends to be both practical and relevant in nature focussing on the link between academic research and organisational performance (Maylor and Blackmon, 2005). This research is carried out using a deductive process whereby the research questions were developed at the outset and have been influenced by the available literature.

The methodology process chosen will impact not only the data collection tools used subsequently by the researcher but will also influence the findings. Blaxter, Hughes and Tight (2010) identify four research approaches as action research, case studies, experiments and surveys. The appropriate approach to take is dependent on the context of the research; Research into KM can fall in each of these approaches but for this project it was concluded that the most appropriate method to investigate tacit knowledge transfer was from a quantitative research perspective.

The three social research paradigms of positivism, post-positivism and interpretivism were reviewed in the context of a quantitative research approach. The paradigm chosen by the researcher will influence the primary research process and the data collection method chosen.

Each area has its protagonists and critics, they are not appropriate for all types of research. In the context of this research, a positivist approach is most suitable as the research question and objectives have been outset at the start of the research process.

3.2   Approaches to Research Strategies

The research strategies of action research, experiments and case studies were considered but deemed unsuitable as the research criteria and variables have been defined at the outset of the process. Finally the strategy of using surveys was considered, Aldridge and Levine (2001) as cited in Blaxter, Hughes and Tight (2010) note that surveys are by their nature, associated with standardisation and as such can result in generalised results. Blaxter, Hughes and Tight (2010) identified issues surrounding accuracy and truthfulness of the responses received as a potential weakness in using this approach. Surveys were chosen as the most appropriate research strategy, distributed anonymously online with the aim of securing accurate and truthful responses. Due to the sensitive nature of KM and the reasoning behind peoples' reluctance to share tacit knowledge in

certain environments and situations, it is hoped that providing the respondent's with an anonymous online survey to complete, it will heighten the level of accuracy and truthfulness in the responses.

3.3   Sampling and Selection

Taking the research questions posed by the author it is clear that the most appropriate sampling strategy is stratified sampling where characteristics of the sample group are known and targeted for review (Blaxter, Hughes and Tight, 2010). In this context, only respondents who have worked or currently work in an open plan office environment are sought. An advantage stratified sampling has over other strategies is that it ensures that the resulting sample will be distributed in the same way as the stratifying criterion (Bryman and Bell, 2007).

A major limitation of this form of research is the possibility of a low response rate. As advised by previous researchers and with these weaknesses in mind, a pilot questionnaire was sampled prior to distributing the final questionnaire to the sample. This pilot questionnaire has been added to Appendix 1 for review. Smith and Albaum (2005) proposes that the benefits of pre-testing is in the feedback gained by the sample group who provide constructive criticism on the layout, the content, the clarity of the questions posted and any confusion the respondents may have experienced while completing the pilot questionnaire. Feedback from the pilot influenced the final questions chosen. As a result, the final developed questionnaire (see Appendix 2) contained 18 questions across six sections.

Questionnaire Sections:

1.   The working environment: Open plan or closed office

2.   Internal knowledge sharing

3.   The importance of internal knowledge sharing

4.   Communication amongst staff

5.   The approach management take to knowledge sharing

6.   General questions regarding the respondents.

The questionnaire was distributed to 230 respondents across a diverse range of sectors. A link to the questionnaire was emailed with a brief note introducing the purpose behind the research and thanked them for taking the time to complete the questionnaire.

4. Results and Findings

The findings from this research can be applied across a number of sectors. The questionnaire was distributed to a sample size of 230 respondents working in a variety of industries and organisational structures. To ensure candid and comprehensive responses, the questionnaire was completed anonymously with only a small number of personal questions asked in the final section. The questionnaire (see Appendix 2) was presented in six pages, each representing one of the six sections detailed above as developed during the literature review and research methodology process. The respondent had the option to skip questions but not to see the next set of questions before completing the current page. This format ensured that the questionnaire was completed in order. It was not compulsory to answer each question and therefore the results show a number of questions where no response was entered. These are represented in the analysis below labelled "No Response". The questionnaire was distributed using a user friendly website to host the survey and collate the data. This website: http://smart-survey.co.uk/, also offers a data analysis function allowing data mining and analysis through the website.

The respondent was able to enter their employment sector manually rather than providing a drop down menu to ensure an accurate response was obtained. Respondents were also invited to submit comments which were reviewed and considered during the analysis phase.

4.1 Results and Analysis

The survey was live for a period of two weeks within 144 responses from the sample size of 230 resulting in a response rate of 62.6%. This falls within the "acceptable" parameter (60-70%) as set out by Mangione (1995) as cited in Bryman and Bell (2007). A small number of respondents (6 respondents) noted that they have never worked in an open plan environment. This was covered in Section 1 of the Questionnaire. As such, these responses fall outside the primary research criteria and have been excluded from further analysis.

Figure 3: Summary of Questionnaire Results

Key Analysis:	
Overall Synopsis:	
Sample size	230
Response rate	144
% Response rate	62.6%
Respondents who currently work in an open plan environment	123
Respondents who previously worked in an open plan environment	15
Respondents who have never worked in an open plan environment	6
Resulting sampling error	4.2%
Additional summarised Information	
Gender Division:	59%
- Female Respondents	41%
- Male Respondents	

4.2 Analysis: Section 2 - Internal knowledge Sharing

Section 2 contained four questions which aimed to investigate the respondents opinion on internal knowledge sharing within their organisation. Each question asked the respondents to rate their responses on a 5-point scale.

Section 2:

Question 3: Open Plan working environments encourage knowledge sharing amongst staff.

Question 4: Open Plan environments reduce internal barriers to transferring and sharing knowledge.

Question 5: Open plan environments enhance opportunities for innovation amongst staff.

Question 6: Informal training and knowledge transfer activities such as informal mentoring and learning on the job are effective knowledge sharing activities in your company.

The response range was based on a five point scale:
- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Question 3 sought the respondents overall opinion on knowledge sharing in an open plan environment, the majority of respondents responded positively with 55 per cent agreeing and 30 per cent strongly agreeing with the statement posed. The results from Question 4 showed that in conjunction with the initial question on open plan working spaces, a large percentage of respondents either agree (45%) or strongly agree (29%) that an open plan environment helps to reduce the barriers amongst employees to sharing their knowledge within an organisation.

As discussed in the literature review, Nonaka and Takeuchi (1995) and Xu et al. (2010) recognised the link between managing knowledge and innovation within the organisation as a source of achieving a sustainable competitive advantage. Question 5 investigated how employees felt about opportunities for innovation within an open plan structure. A small percentage of respondents strongly disagreed (1%) or disagreed (6%) with the suggestion that innovation was fostered by an open plan structure. Comments submitted by respondents identified noise and disruption issues in open plan work spaces causing difficulties.

The final question in this section (Question 6) asked whether informal knowledge sharing activities such as mentoring and learning on the job were viewed as effective. Mayfield (2010) identified informal mentoring as an effective knowledge sharing activity through casual interaction amongst staff. The findings show that 84 per cent of respondents either agreed (48.6%) or strongly agreed (35.5%) that that these activities do contribute to effective knowledge sharing within their organisation.

4.3   Analysis: Section 3 - Internal Recognition of the Importance of Knowledge Sharing

The questions in this section probed how employees viewed the knowledge transfer process within their organisation.

Section 3:

Question 7: *Formal reward and recognition systems encourage employees to share their skills, experience and "Know-How" with others.*

Question 8: *Sharing knowledge with colleagues decreased your value within the company as colleagues increase their skill-set.*

Formal reward systems were identified by Mayfield (2010) as an activity that encourages knowledge sharing. A formal reward and recognition system provides a structure allowing both the knowledge source and recipient to benefit from the transfer process. It is interesting to note that 36 respondents (26%) responded with a neutral opinion feeling that formal systems didn't have much an impact on sharing knowledge. Feedback from respondents suggested that the existence of a team-based reward system would prove more effective as it would encourage staff to work as a team.

Stenmark (2001) acknowledged three reasons why organisations fail to benefit from tacit knowledge:

1. A lack of awareness of ones' tacit knowledge

2. For an individual to do their job it is not necessary for them to express this knowledge.

3. It can be seen as providing an individual with a competitive advantage in the organisation.

It is the final reason that formed the basis for Question 8, the author sought to discover if employees felt that their personal competitive advantage or value was diminished as a result of sharing their knowledge. The research findings clearly showed that the respondents did not feel that their value within the organisation was compromised by sharing knowledge. 22 per cent strongly disagreed and 49 per cent disagreed with this statement.

4.4   Analysis: Section 4 - Communication amongst Staff

In their research into communication and knowledge transfer, Murray and Peyrefitte (2007) concluded their research by emphasising the importance of the communication channels chosen for knowledge transfer. An open plan environment encourages direct contact between employees and these questions aimed to discover how comfortable employees were at approaching colleagues directly.

Section 4:

Question 9: A good working relationship increases the likelihood of knowledge being effectively shared amongst colleagues.

Question 10: Do you feel comfortable directly approaching a colleague for assistance in an open plan setting?

Question 11: In situations where you are not comfortable directly approaching a colleague for assistance in an open plan setting, what is the preferred method of communication?

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Research has shown that the relationship between the knowledge source and recipient is of paramount importance in the successful transfer of knowledge. Gururajan and Fink (2010) state that the level of trust that exists between the source and recipient can act as a facilitator or barrier to knowledge transfer. This forms the basis Question 9. The findings show that the respondents overwhelmingly agree that a good working relationship is paramount for sharing and transferring knowledge with 62 per cent of respondents strongly agreeing with the statement posed.

One of the main concerns the author had in relation to working in an open plan environment was whether employees would feel comfortable directly asking for assistance. However, the questionnaire findings have shown that for Question 10, 54 per cent of respondents always feel comfortable directly approaching colleagues. 45 per cent of respondents only feel comfortable directly approaching colleagues either occasionally (9%) or sometimes (36%). Although the results of Question 10 have shown that over 50 per cent of respondents are comfortable contacting their colleagues directly for assistance, in situations where an alternative method of communication is preferred, email is the most popular choice with 59 per cent of the findings.

4.5   Analysis: Section 5 - Management Approach to Knowledge Sharing

The final two core questions on the questionnaire focussed on the management approach to knowledge sharing within the organisation.

Section 5:

Question 12: *Management within your organisation encourages staff to share their knowledge with others.*

Question 13: *Management within your organisation have policies in place to ensure knowledge held by employees leaving the company is passed on before they leave.*

The results show that even though respondents felt that management encouraged knowledge sharing amongst staff, they don't have policies or procedures to ensure knowledge is "passed on" or transferred when employees leave the organisation. Failing to ensure knowledge is retained within the organisation is a major failing by management. Only 9% of respondents felt that they strongly agreed that their management had policies in place to deal with knowledge transfer and employee attrition rates.

4.6 Additional Feedback

The final question asked the respondents to provide feedback on working in an open plan environment. The feedback received has been categorised into positive and negative aspects of working in an open plan environment.

Positives aspects to open plan environments include:

− Open plan environments provide good opportunities for social interaction

− It provides a good basis for creativity amongst staff

− It allows for informal learning on tasks and projects completed by other teams.

− Removes the physical barriers to learning and sharing knowledge.

Negatives aspects noted by respondents:

− Open plan settings can be noisy and distracting impacting concentration levels

− It can be difficult to leave on time when colleagues remain at their desks

− There is a lack of privacy to discuss issues with management

− Open plan settings are not appropriate for client meetings

− Management require privacy to discuss confidential issues such as employee appraisals and other HR matters.

Respondents also noted that the success of an open plan environment is dependent on a number of factors including the job itself, the personalities of the employees, the culture and structure of the organisation.

The next chapter will draw conclusions to the primary research findings. It will also make recommendations for further research and finally outline a number of limitations to this research project.

5. Conclusions & Recommendations

During the research process it became clear that through interacting with the respondents either directly where possible or over email that "learning" from colleagues within companies is a situation that people are familiar with, although they may not have recognised this in terms of knowledge transfer. Non-academic terms were deliberately used as it was recognised that the respondents may not be familiar with the academic terms of knowledge management, tacit knowledge or the knowledge transfer process.

5.1 Conclusions: Internal Knowledge Sharing

The feedback from the questions relating to knowledge sharing highlighted that the respondents questioned predominantly agree that an open plan environment assists in the knowledge transfer process by physically removing barriers such as offices, walls and doors.

The literature review suggested that an open plan environment encouraged and enhanced innovation. The primary research showed that 50 per cent of respondents agreed with this concept. It is positive to see that employees themselves feel that by removing the physical barriers within the organisation, that the innovation process may be encouraged further.

Xu et al. (2010) emphasised that recognising, encouraging and managing knowledge was a challenge faced by management. The results presented by this study propose that the lack of physical barriers and the adoption of an open plan layout informally encourage and promote both knowledge sharing and innovation. The primary research confirms that the employees themselves view an open plan organisational layout as positive to enhanced innovation.

The primary research also investigated whether informal knowledge sharing activities such as mentoring and learning on the job were seen as effective within the respondents' organisation. These informal learning activities are fostered within an open plan environment by the nature of the structure. The findings show that 84 per cent of respondents either agreed (48.6%) or strongly agreed (35.5%) that that these activities do contribute to effective knowledge sharing within their organisation. These findings confirm the argument put forward by Mayfield (2010) that informal mentoring could be adopted as an effective method of transferring tacit knowledge through casual interaction amongst staff.

5.2 Conclusions: The Importance of Knowledge Sharing

As both academics and professionals each recognise that informal knowledge sharing goes primarily unnoticed and unrecognised within the organisation, it also means that the transfer process goes unrecognised and unrewarded by management. This statement was probed in the questionnaire (Question 7) where respondents were asked whether they felt that a formal system recognising their role in the knowledge transfer process would encourage sharing within the organisation.

Although the results showed that the majority of respondents either agreed (45%) or strongly agreed (17%) with the statement posed, 26 per cent held a neutral opinion and 9 per cent disagreed with the statement. This indicated that not all employees are motivated to share their know-how and skills based on financial reward. The introduction of a formal reward system for knowledge transfer would provide a format for transferring the knowledge from tacit to explicit, therefore providing management with a means to codify the information for developing policies and procedures. Supplementary feedback on this topic proposed that a formal recognition of knowledge sharing should be Team-focussed rather than focussed purely on the individual to foster a sense of teamwork within the department.

The primary research also indicated that respondents did not feel that their "USP" was compromised by sharing their knowledge with others. The findings reported 49 per cent felt that they disagreed with the statement posed and a further 22 per cent strongly disagreed with the statement. The results these two questions is very encouraging for companies as they indicate that the respondents are not primarily motivated by formal rewards nor do they feel that they should retain their knowledge.

5.3 Conclusions: Knowledge Sharing and Communication

A core argument put forward at the outset of this research was the link between the academic research on KM and in the area of Communication methods. Emphasis was placed on the importance of trust and a good working relationship for successful knowledge transfer. In an open plan working environment the communication amongst colleagues is of paramount importance and can lend itself to the overall organisational culture. The research analysis showed that 54 per cent always felt comfortable directly approaching a colleague for assistance. Where people felt that an alternative method of communication was preferred, the most popular response was email

(59%) followed surprisingly by Instant Messenger (19%). It is possible that these methods are preferred as they are silent communication formats where it is not necessary to communicate vocally in the office. There can be many reasons behind this, the query or conversation may be of a private nature or the information sought may be confidential. Choosing these alternative methods of communication may not be as a result of feeling uncomfortable either with the colleague in question or the open plan setting.

5.4 Conclusions: Management Involvement and Interaction

The primary research investigating the involvement of management in the tacit knowledge transfer process yielded interesting and somewhat contradictory results. Although the analysis clearly showed that a large portion of participants agreed (45%) or strongly agreed (29%) that the management in their organisation encouraged staff to share their knowledge with colleagues throughout the organisation, there appeared to be a failing of management across the board to formally recognise this by adopting and maintaining policies and procedures for capturing this knowledge as employees leave the organisation.

It is clear from the breakdown of the results from the question relating to knowledge retention within the organisation in the event of employees leaving that management are failing to ensure that the tacit knowledge these employees hold is retained by the organisation. The analysis specified that only 30 per cent agreed and 9 per cent strongly agreed that management in their company had adequate policies in place to ensure knowledge is retained as employees leave. Failing to retain knowledge is a major failing by management.

The final section investigated by the questionnaire on the management's approach to knowledge transfer and sharing internally has raised concerns. Although 45 per cent agreed and 29 per cent strongly agreed that management in their organisation encouraged knowledge sharing amongst staff, the response rate to Question 13 regarding the existence of official explicit knowledge transfer policies was significantly lower. These findings raise concerns that although management encourage employees to share and interact with each other, this is not followed up with formal processes. This results in the loss of knowledge through attrition.

5.5 Research Limitations

The key limitation to this research project is the associated time frame, other limitations included access to respondents, due to the time constraints, the author chose an email questionnaire method. Organisational limitations precluded the author from primarily investigating their place of work and as such the research results are broad in nature.

5.6 Recommendations

The very nature of an open plan environment encourages direct communication and sharing amongst employees. However it is important to note that an open plan office can also offer its own barriers as people can feel that the nature of an open plan environment is a barrier in itself and they are not comfortable approaching colleagues in front of others.

It is clear that the research questions are inter-linked and knowledge sharing involves both communication and interaction with other colleagues. The success of the transfer process and indeed the further development of the knowledge sources' own level of knowledge (The Internalisation phase of the Knowledge Spiral, Nonaka, 1995) is also dependant on the other colleagues within the organisation, the management structure and their approach to knowledge sharing. The author recommends that further research into the links between communication channels and knowledge management is required to ascertain both the underlying reasons to knowledge transfer barriers and also methods of overcoming these.

Further research is possible to investigate the link between open plan structures and knowledge management transfer as it is clear that the adoption of an open plan layout has positive implications for knowledge transfer that can be exploited by management. This research was quantitative in nature, further research conducted using qualitative methods could result in more in-depth findings. This research could be carried out in a number of formats across different organisational sectors, comparing the views of management to lower ranked employees and with people who have worked in both Open Plan and closed door environments.

Finally, it has been mentioned previously innovation has been recognised as vital for creating and maintaining a strategic competitive advantage for organisations over competitors. Further research

into the potential that open plan layouts have for enhancing innovation opportunities could yield interesting and practical results for organisations to adopt.

APPENDIX 1: PILOT QUESTIONNAIRE

Knowledge Sharing in an Open Plan Office: Pilot Questionnaire

Section 1: General Questions:
1. Are you:
− Male
− Female

2. What age bracket are you in?
− 18-24
− 25-34
− 35-44
− 45-54
− 55+

3. What industry do you work in? (E.g. Hospitality, Financial Services, etc.)

Section 2: Organisational Structure
Please use the evaluation scale to answer the following statements

Evaluation Scale:
(5) Strongly Agree (4) Agree (3) Neutral (2) Disagree (1) Strongly Disagree

4. Open plan working environments encourage knowledge sharing amongst staff.
(5) (4) (3) (2) (1)

5. Open Plan environments reduce internal barriers and enhance opportunities for innovation.
(5) (4) (3) (2) (1)

6. Informal mentoring and "learning-by-doing" are effective knowledge sharing activities in your company.
(5) (4) (3) (2) (1)

7. Formal reward and recognition systems encourage employees to share their skills and "Know-how" with others.
(5) (4) (3) (2) (1)

8. Sharing knowledge with colleagues decreases your value within the company as colleagues increase their skill-set.
(5) (4) (3) (2) (1)

9. A good working relationship increases the likelihood of knowledge being effectively shared amongst colleagues.

(5) (4) (3) (2) (1)

10. Are you comfortable asking for assistance from a colleague in an open plan environment?
− Yes

− No

11. If No, what is the preferred method of asking for assistance;
− Email
− Telephone
− Using meetings / meeting rooms
− Instant messenger e.g. Lotus Notes "Same Time"

−

Section 3: Management Strategy to Knowledge Sharing:

12. You feel your employer encourages staff to share their knowledge with others.
(5) (4) (3) (2) (1)

13. Your employer should do more to reduce the loss of knowledge held by colleagues before they leave the company.
(5) (4) (3) (2) (1)

APPENDIX 2: QUESTIONNAIRE

Knowledge Sharing in Open Plan working environments

This questionnaire is to assist in my research into knowledge sharing in an open plan organisational environment.

An "open plan" environment is defined as one where floor-to-ceiling walls have been replaced by partitions, screens, plants or other equipment designed to separate individual and departmental work areas.

If you work in an environment which is considered open plan and answer "yes" to questions one or two, please complete the following survey.

Many thanks for taking the time to complete this questionnaire.

Caroline

What is your working environment?

1) **Do you currently work in an open plan working environment?**

   ○ Yes

   ○ No

2) **If you answered "No" for question 1, have you previously worked in an open plan environment?**

   ○ Yes

   ○ No

[Next Page]

Internal Knowledge Sharing

Please use the evaluation scale to answer the following statements

3) Open plan working environments encourage knowledge sharing amongst staff.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4) Open plan environments reduce internal barriers to transferring and sharing knowledge.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

5) Open plan environments enhance opportunities for innovation amongst staff.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6) Informal training and knowledge transfer activities such as informal Mentoring and learning on the job are effective knowledge sharing activities in your company.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

[Previous Page] [Next Page]

Internal Recognition of the importance of Knowledge Sharing

7) Formal reward and recognition systems encourage employees to share their skills, experience and "Know-how" with others.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

8) Sharing knowledge with colleagues decreases your value within the company as colleagues increase their skill-set.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

[Previous Page] [Next Page]

Communication amongst employees

9) A good working relationship increases the likelihood of knowledge being effectively shared amongst colleagues.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

10) Do you feel comfortable directly approaching a colleague for assistance in an open plan setting?

☐ Never ☐ Occasionally ☐ Sometimes ☐ Always

11) In situations where you are not comfortable directly approaching a colleague for assistance in an open plan setting, what is the preferred method of communication?

☐ Email ☐ Telephone ☐ Meetings ☐ Instant Messenger (e.g. Lotus Notes "Same Time")

[Previous Page]   [Next Page]

Management Approach to Knowledge Sharing

12) Management within your organisation encourages staff to share their knowledge with colleagues.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

13) Management within your organisation have policies in place to ensure knowledge held by employees leaving the company is passed on before they leave.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

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General Questions

14) Are you:

☐ Male ☐ Female

15) What age bracket are you in?

☐ 18-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55+

16) What industry do you work in? (E.g. Hospitality, Financial Services, Public Sector etc.)

17) How many employees are there employed within your organisation?

☐ Less than 50 ☐ 50-249 ☐ 250-499 ☐ 500+

18) Are there any comments you would like to note relating to working in an open plan environment?

[Previous Page] [Finish Survey]

You have completed this survey!

Thank you for taking the time to answer this survey!

APPENDIX 3: PRIMARY RESEARCH FINDINGS

Appendix Three summarises the primary research findings by Organisational Sector. It is included here for information purposes only. As stated at the outset of the research, the author believed that tacit research transfer was a problem that existed in a broad range of organisational sectors and as such chose conduct primary research across a broad range of industries.

Figure 4: Respondents Employment Sector

Respondents Employment Sector		
Accountancy	Graphic Design and Branding	Private Sector
Aviation	Health and Beauty	Property Management
Banking	Health and Fitness	Public Sector
Construction	Healthcare	Publishing
Design Engineering	Hospitality	Radio / Broadcasting
Education / Teaching	ICT	Recruitment
Energy Services	Insurance	Retail Sector
Engineering	Investment services	Services Industry
Facilities Management	IT	Tourism
Finance	Legal	Travel Industry
Financial Services	Manufacturing	
Gambling / Betting Industry	Not for Profit Organisation	

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