Perceptions Towards Knowledge Management in Project-Based Organisations

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Abstract
This paper explores members' perceptions towards knowledge management in project-based organisations. Due to the temporary nature of a project, managing a project's knowledge in an appropriate manner will be necessary in order to avoid memory loss and reinventing the wheel. The main research approach of this study was a qualitative research method to provide in-depth understanding of the research participants' perceptions and attitudes towards knowledge management. The authors applied semi-structured interviews for collection of data from twenty-six participants in five project-based companies. The collected data were analysed by grounded theory method to explore and understand the research participants' point of views regarding the studied phenomenon. Through data analysis, three major categories were suggested: Knowledge management is a communicating methods between members in and across project teams; Knowledge management in itself means sharing information and valuable intellectual assets; and Large number of members in the research participating companies has already conducted knowledge management with unconscious manner.
Keywords: knowledge management, project-based organisations, perceptions, communication, knowledge sharing

1. Introduction

Knowledge has been treated as a key successful factor and a critical resource in business and management researches for quite a long time now (Drucker, 1993). However, it has rarely been managed systematically and has been take into account a field of research for only a decade. Nonaka (1991) suggests the need for knowledge management through the observation of Japanese companies, such as Honda, Canon, and Sharp. Knowledge management composes of several managerial activities, which are creation, acquisition, storing, sharing and transferring knowledge in an organisation to fulfil lots of purposes. The main purposes of knowledge management may be to gain competitive advantages, improve a firm's performance level, achieve innovation, and develop new products and services faster than competitors (Davenport et al., 1998; Gant, 1996; Lubit, 2001; Nonaka and Takeuchi, 1995). In the recent economic environment, knowledge is regarded as one of a corporation's resources which have to be properly managed and controlled with rigorous managerial practices as with labour and capital.

Despite continuous interests of managing knowledge in business and management studies, knowledge management in project-based organisation is quite difficult and challenging because of the unique characteristics of projects and project management. (Almeida and Soares, 2014; Lindner and Wald, 2010; Wiewiora et al., 2013; Zhao et al., 2015) A project is a temporary organisation which is goal-oriented, pursuit of visible outcomes and managed in constrained budget and time (Hanisch et al., 2009; Hobday, 2000; Keegan and Turner, 2002; Turner, 2009). Accordingly, disbanding the project team after completion of goals is inevitable. These characteristics make project team members difficult to manage knowledge. This means, when a project team is disorganised, valuable information and knowledge would be disappeared, unless it is managed, transferred, and shared with systematic ways. In addition, development of new products and services by project management is more popular than previous, since its agile and flexible forms of organisations to react towards the recent trends of market and customers. As a result, it is important to manage project's knowledge, while we should carefully take into account the nature of a project and project management. In order to develop strategies for utilisation of knowledge management in project-based organisations, it is required to understand the current role and position of knowledge management. The purpose of this study is to grasp project team members' understanding and attitudes towards knowledge management, which is considered as an inevitable and essential managerial activity to preserve and attain competitive advantage as well as to improve a company's performance and capability.

This paper composes four parts as follows. Firstly, we review the literature to establish a theoretical background of knowledge, knowledge management and knowledge management in project management context. Then, a brief explanation of research method, which encompasses data collection and data analysis method, is presented. Following research methodology, detailed explanation of findings of this study is demonstrated and this article concludes with briefly recapping the overall work.

2. Theoretical background

2.1 Knowledge management

When it comes to the definition of knowledge management, there seems to be numerous interpretations among the authors. The lack of common definition of knowledge management is due to the fact that knowledge is a complex, multidisciplinary and philosophical concept. In addition, the lack of common definition of knowledge management is also the case with the firm as it can be viewed differently by a various people depending on the experience, background and seniority of the person under the knowledge management. For example, knowledge management can be interpreted as the measurement and tracking of intellectual capital in the firm to the CEOs or executives. Knowledge management may mean the consolidation of the best practice and the enhancement of customer satisfaction to middle managers. Employees will interpret knowledge management that can lead to less time consumption, higher quality and productivity.

There are different definitions of knowledge management by researchers, as seen in Table 1. In spite of variety of definitions on knowledge management, it is common that knowledge management is a connection of people-to-knowledge to create a competitive advantage in changing economic environments. Knowledge management can be defined as a systematic process to identify, create and share various and available knowledge within an organisation. Moreover it is the subsequent control and protection of actions to develop the knowledge assets to fulfil the organisational objectives.

Table 1 Various definition of knowledge management

Researcher	Definition
Gore and Gore (1997)	Creating an association between knowledge and action and managing the organisational change resulting from that association
Blair (1997)	Knowledge management aims to capture the knowledge that employees really need in a central repository and filter out the surplus.
Duffy (2000)	A process that drives innovation by capitalising on organisational intellect and experience
Dunn (2004)	The policy and processes, through which organisations seek to create, capture, store, disseminate and leverage organisational knowledge.

2.2 Knowledge management in project management context

It is common to indicate the significance of managing project knowledge in academia and practitioners. Both Project Management Institute (PMI) and Association of Project Management (APM) have underlined the significance of 'lessons learnt' from past projects, and the project closure procedure as a means of reviewing and reflecting on-going projects. According to the Project Management Body of Knowledge (PMMoK) by PMI (2009), it emphasises that one of the important steps in a project management life cycle is project closure for gathering and disseminating valuable project knowledge. In addition, APM Body of Knowledge (2006) also refers to the significance of knowledge creating in a project. It demonstrates that knowledge is created by individual and organisational learning through socialisation, articulation of what each individual knows, embodied into individual skills and works, and expression of what each member's knowledge during projects.

It is commonly accepted that project management is an inevitable trend of management with a responsive fast changing market situation, customers' needs, globalisation, and competitions (DeFillippi and Arthur, 1998; Gann and Salter, 2000; Morris, 1997). Recently, growing number of interests have paid attentions to systematically and efficiently management of project knowledge for prevention of reinventing the wheel, organisational learning, avoidance of organisational memory loss or amnesia, and improving a firm's performance (Boh, 2007; Disterer, 2002). Wiewiora et al. (2013), for example, maintain that since the multifaceted characteristics of knowledge in project management context, it is important for project-based organisations to systematically manage project knowledge. Whist the fundamental concepts of knowledge management in project-based firms have also stressed that knowledge management studies in project environment has to take into consideration its unique and different characteristics. In other words, a project team is a temporary composition of various members from internal functional divisions and external staffs from stakeholders to fulfil the project's goal within a budget and on time (Hanisch et al., 2009). The characteristic of temporality will bring about the project knowledge management problems and difficulties, that is, the loss or fragmentation of project knowledge. These matters may stem from the frequent turnovers of members and reassignment of staffs to each project. Even though the project knowledge will be collected after finishing the work through project learning, it cannot avoid knowledge amnesia or leakage due to the time lapse (Schindler and Eppler, 2003). Additionally, the sources of knowledge within project-based organisations are various during different stage of a project, different personnel and so on as well as there are lots of different types of knowledge would be required during different phases of project execution and closing stage (Wiewiora et al., 2013). Accordingly, knowledge management in the project management context is not only preventing leakage of organisational valuable intellectual assets, but also managing the variety of sources and types of knowledge

properly.

Moreover, it is widely accepted that due to the temporary nature of a project, systematically managing project knowledge is getting more significant from variety of academics in project management (Lindner and Wald, 2010; Love et al., 2005; Ly et al., 2005; Thiry and Deguire, 2007). Besides, effective and timely implementation of knowledge management will make project-based organisations more competitive and robust to adjust and react towards internal and external challenges and leakages of valuable intellectual assets (Liebowits and Megbolugbe, 2003; Tan et al., 2006; Tan et al., 2011; Wiig, 1997a; Wiig, 1997b). Externally, recent project management has changed to respond to the today's dynamic and changing environment: the scale of projects tends to become larger and more complex than previous; employees are working in an organisation shorter and companies are pursuing for qualified people from external; and new knowledge and information have to be disseminated into the company to share the new insights and knowledge (van Donk and Riezebos, 2005). In a nutshell, managing project knowledge is not a selective option for a firm, but it is an indispensable element to improve a firm's performance, and to prevent leakages of valuable intellectual assets and reinvention of the wheel.

The knowledge management studies in project-based organisations can be divided into two major researches. One stream of research on knowledge management within project environment is stressing the significance of knowledge management itself to achieve improved performances and competitive advantage reflecting the recent economic environment. This sort of researches indicate the significance of knowledge management and its potential role as well as the success factors of knowledge management in project-based organisations rather than suggesting detailed methods or ways for improved knowledge management capabilities. Studies in this category have also explained how knowledge should be retained and managed as well as what project-based organisations would obtain potential benefits from knowledge management (Carrillo, 2004; Carrillo and Chinowsky, 2006; Carrillo et al., 2004; Kamara et al., 2002). For example, Ajmal et al. (2010) stress that knowledge management in project management context is inevitable in order to increase the project's efficiency as well as to establish sustainable competitive advantage. In their research, they propose the potential influencing factors for successful knowledge management in project-based organisations: an attractive incentive system; coordination amongst departments and employees; and an organisational culture, which encourages participation of knowledge management. Similarly, Lindner and Wald (2010) show how to successfully implement knowledge management in a temporary organisation such as project teams. In this research, they highlight that information and communication technology, and an organisational culture would be crucial factors for success of knowledge management in project-based context. Likewise, lots of academics have researched what the success factors of knowledge management are, and how it would be implemented for its success. Moreover, this type of inquiries is closely related to utilisation of information and communication technology, management of human resource, cultivation of organisational culture, behaviours and leadership (van Donk and Riezebos, 2005). In addition, academics have been exerting to develop methods or techniques to convert tacit knowledge to a more accessible and tangible explicit or codified knowledge. Then, the knowledge will be stored in a knowledge inventory or reservoir so that it would be possible for organisational members to access and utilise the knowledge in the future. This type of the research is closely related to the development of information and expert systems that are pursing to facilitate knowledge management and to develop knowledge management systems based on information and communication technology. Moreover, under this boundary of knowledge management in project management context, variety of researchers has debated the potential role of information and communication technology, and culture (Hanisch et al., 2009). Such researches deal with a macro level of knowledge management in project management context and it would be a general guideline for shedding light on its existence and arousing its importance.

The other research stream of knowledge management in project management context has dealt with the characteristics of underlying stages in knowledge management, which are creating, acquiring, transferring, sharing, and disseminating (Huang and Newell, 2003; King, 2008; Tan et al., 2006). The academics' enquiries of this category has analysed knowledge management cycle models that describe the key elements of knowledge management during the project management phases or cycles (King, 2008). These researches are not only dealing with developing detailed methods for building a knowledge inventory, disseminating knowledge inter and intra project organisations, but also exploring measurement tools of knowledge management initiatives and activities. Boh (2007), for example, elucidates four types of knowledge sharing mechanisms in project-based organisations: personalisation and codification; and institutionalisation and individualisation. Moreover, lots of academics in this category have focused on "lessons learned" and "post-project reviews" as an important means to transfer and disseminate project knowledge to other projects (Ajmal et al., 2010; Anbari et al., 2008; Disterer, 2002). Disterer (2002), for instance, shows his interest towards project closing step which would be very important for knowledge recirculation and accumulation. In addition, Anbari et al. (2008) also emphasise the significance of post-project reviews as a medium to enhance the organisation's competence as well as exploring the reasons why current post-project reviews are not used even though lots of researchers and practitioners have

underlined its significance and usability.

In a similar vein, Newell, Brensen, Edelman, Scarbrough, and Swan (2006) studied limited usage and potential problems regarding ICT-led project review practices. In this study, they pointed out the status of recent projects that focus on products or deliverables rather than processes. In addition, they also stress the need of intermediaries for balancing between individual knowledge and organisational knowledge in ICT-led projects. According to them, the development of a personal network for enhanced knowledge sharing and transfer between and within projects are the key problems of currently using post-project review practices as a means of management of project's knowledge. Along with the researches stressing the important role of post-mortem activities, some of the researchers have suggested practices to enhance capturing the project knowledge and stressed that capturing the project knowledge without losses or fragmentations is one of crucial matters in knowledge management within project-based organisations to resolve the knowledge leakage problems. Kamara et al. (2002) assert that the main cause of knowledge losses and fragmentation is the time lapse so the resolution of this situation might be capturing and storing the knowledge in real time. Schindler and Eppler (2003) propose that debriefing subsequent to milestones would be beneficial to project knowledge repository compared to existing techniques such as post project research and knowledge evaluation. Tan et al. (2006) is consensus with the importance of knowledge acquisition with minimising the leakage and they suggest the 'Live capture' methods of project knowledge to avoid knowledge outflows. Teerajetgul et al. (2009) suggest the web-based information and communication technologies would facilitate capturing the project knowledge in real-time and on site. Researchers in this context of knowledge management studies, not only concentrate on micro level problems of knowledge management phases (e.g. creation, storage, dissemination, sharing, transferring), but also develop more detailed approaches rather than general guidelines and principles.

3. An overview of the research methodology
3.1 Data collection
The main focus of this study was to explore project team members' perceptions towards knowledge management. According to PMI (2009), there are several different types of organisational structures in project-based organisations. In this study, the authors focused on a strong matrix structure organisation and based on this criterion, five companies were chosen as the samples of this study.

The selection of the research methodology depends on the type of research questions, the level of control the researcher over actual behavioural events and whether the focus is on contemporary or historical events. The research methodology also requires fitting in with the researcher's methodological assumptions and the researcher should be comfort with the method. This research was mainly conducted through qualitative method based on the relativist's ontological stance, and the constructivist's epistemological backgrounds. This study adopted semi-structured interviews as a data collection strategy. The total number of interview participants were twenty-six and the interviewees were selected across the companies in order to ensure representativeness and to avoid any preconceived perceptions with respect to the research topic. Table **2** shows the details of the research interview participants. Along with the interview data, the researchers also utilised various kinds of companies' internal sources of data such as internal reports with a permission of the involved companies. The access of these references would make it possible for the researchers to broaden point of views regarding the studies phenomena as well as to enhance the research findings.

Table 2 Details of the interviewees

Name of company	Strategic management	Tactical management	Operational management	Total
Company A	1	4	1	6
Company B	0	5	9	14
Company C	2	0	0	2
Company D	2	0	0	2
Company E	1	1	0	2
Total	6	10	10	26

Grounded theory method, which was suggested by Corbin and Strauss (2008), was adopted as the main data analysis strategy of this study. This approach is useful to generate theories rather than testing theories, verifying hypotheses or providing a description of researched issues. In this study, grounded theory is considered as one of the appropriate approaches for inductive analysis and a theory building approach (Bowen, 2006; Denzin and Lincoln, 2011; Urquhart, 2013). According to Corbin and Strauss (2008), systematic coding is an essential for analysing and categorising the data for better understanding and generating new theories. The coding procedures of this study compose of two stages, which are open coding and axial coding. In addition, this study also conducted 'constant comparative analysis' for developing a theory around the core variables. That is, a theory will be developed, when a researcher constantly carries out and make comparisons between theoretical categories. In summary, the authors conducted systematic coding and constant comparative analysis in order to expand and deepen the research participants' perceptions towards knowledge management within project

management context.

4. Findings

The collected data were analysed to figure out the interview participants' understanding and perceptions regarding knowledge management in project-based organisations. This process was useful to provide and comprehend the status quo phenomena of knowledge management in research participating companies. The authors group the categories into based on similar concepts and properties. The major categories of perceptions towards knowledge management within project-based organisations fell into three:

1. Knowledge management is a communicating method between members in and across project teams.
2. Knowledge management in itself means sharing information and valuable intellectual assets with other members in a project team.
3. Large number of members in a team has already conducted knowledge management activities with an unconscious manner.

Majority of the research participants considered that knowledge management is not simply sorting or classifying the intellectual properties into knowledge management systems, but it is a type of communicating channel or a method to share ideas, information and valuable documents with colleagues. They suggested that communicating and sharing the information, data, knowledge or any types of verbal and physical information is more important that producing or creating new knowledge, and sorting it into a company's knowledge repositories. A number of quotations from the interviews are presented in the below section to illustrate comprehension of the major categories of this study.

4.1 Knowledge management is a communication method

A large number of the interviewees agreed that knowledge management would be a useful strategy to preserve and utilise the company's valuable intellectual assets. In this study, the research participants stated that one of the remarkable roles of knowledge management is not only to preserve created and gathered knowledge from past projects but also to disseminate these valuable properties to other members in other teams. An informant in Company A described the usefulness of knowledge management as:

> "We report all the problems and difficulties in the company's knowledge system during a project's execution. This information will be updated after each project's closure phase. Through knowledge management systems, we could avoid potential risks and problems during a project execution because such information was shared in the company."

One of the potential roles of knowledge management would be a medium to connect predecessors and successors in projects. Normally, it is widely accepted that knowledge is transferred through a variety of interpersonal activities as well as documents and artefacts. A number of the informants indicated that it would be difficult or impossible to contact knowledge holders fact-to-face when the knowledge seekers want to acquire knowledge from them. However, knowledge management could overcome such barriers and enhance knowledge sharing with colleagues. Moreover, systematically shared knowledge in a firm could connect the past and current members regardless of the temporal restriction. Accordingly, knowledge management is not only a warehouse of information and knowledge produced in projects and project teams, but also a conduit to communicate with lots of members. A project manager in Company D reflected the significant role of knowledge management and knowledge sharing:

> "I think managing knowledge means continuous communication with others in a firm. Also, sorting and creating knowledge is important but such activities also require constant contact and exchange ideas with others to classify and produce new one."

4.2 Knowledge management means sharing

Accompanying with the perspective which considered knowledge management as a communication and warehouse of intellectual properties, variety of the interview participants thought that knowledge management in itself means sharing knowledge. Despite knowledge management has several different processes as shown in the previous section, they reflected that the core of knowledge management is not processing knowledge, but sharing and disseminating acquired and created knowledge amongst members securely in a company. Some of the respondents explained the significance of knowledge sharing because of the unique characteristics of a project, which is a temporary nature. They suggested that transiency means a team would be disbanded after completion of a project. So one of the important aspects of knowledge management in project-based organisations is the produced knowledge should be appropriately shared. In addition, they showed that properly recirculating the possessed knowledge would be a foundation to regenerate and develop new knowledge to sustain competitive advantage and improve a firm's capability as well as an individual's ability. A tactical manager in Company B expressed the significance of knowledge sharing as follows:

> "Knowledge management means to set up a database or a place that can be passed down to other people

easily, more efficiently and effective ways. I think the reason for setting up such a database maybe makes the employees to share knowledge with others comfortably, effectively and efficiently. Knowledge management is sharing knowledge, data, and information with other members easily, for more productive results."

Another informant in Company B also revealed the importance of knowledge sharing in knowledge management:

"Knowledge management is, I think it composes in two aspects. One strand is to put together what you have already known, past experiences, the past studies and so on. Another is to make people to know the collected one. Two things have to be balanced but I personally think that sharing is more important because through sharing process, we can build up relationships or network. And this new networks will be the potential sources for getting or sharing new knowledge."

Similarly, a project manager in Company A expressed the significant role of knowledge sharing as an essential of knowledge management:

"I guess knowledge management for me basically means having a process, in place to capture what an organisation sort of knows. And then to find a way to both make it available but also to share it and encourage sharing between different employees in the same company."

4.3 Unconsciously managing knowledge

It was an interesting finding of this study that quite a large amount of the informants has already participated in knowledge management and knowledge sharing, even though they did not recognise their activities were involved in knowledge management. In this case, while the informants described their routines and activities, they did not recognise knowledge management activities and relevant behaviours. Through one's own knowledge management activities and processes, one would be able to improve workflows and knowledge retrieval. One of the fresh perceptions was that one interviewee expressed that she disseminated information and data from past projects to others without any hesitance or reluctance. As doing this she would be able to retrieve already-known information or knowledge in a situation where she could not remember the share knowledge or information. Through sharing one's information and knowledge with others, it would be circulated in a company and it would be able to prevent knowledge loss or amnesia.

"For me, I used to share, and am sharing knowledge with colleagues in my team, because through this activity, the knowledge keep circulated and some of them may remember it, even though I can't remember it when I really need it in the future."

In addition, some of the research informants pointed out that one of the most essential processes of knowledge management is not implementing knowledge management activities, but to explore and sort the relevant activities. Such classification works would be important for a company, because it would save time and money from duplicating and reinvesting knowledge management systems. One of the tactical managers in Company A indicated this as follows:

"There are a lot of similar activates and campaigns in terms of knowledge management. One of the most urgent and important tasks to proliferate knowledge management around the company would be to find out what activities and things are relevant to knowledge management and we will have to perform in systematic ways. Probably, some of the activities were not named or adopted the name of knowledge management but they are closely related to knowledge management."

5. Conclusions

Our study explored members' perceptions towards knowledge management in project-based organisations. The authors adopted a qualitative research method for gathering in-depth understanding of knowledge management within project management context. While the research participants revealed a number of understanding and attitudes, they were categorised into three major categories: knowledge management is a communicating method; knowledge management in itself means sharing; and lots of members has already managed knowledge with an unconscious manner. In this study, we examined that majority of the research participating companies have implemented and conducted similar knowledge management activities. However, they were not aware the existence of knowledge management activities since some of them were not titled as knowledge management or similar. In order to enhance and proliferate knowledge management in project-based organisations, we suggest that a firm should examine the existing knowledge management systems activities thoroughly. After this probing process, a company would be able to choose the best appropriate firm-specific knowledge management approach and to lead the best outcomes from knowledge management.

Although this research was to explore project team members' perceptions towards knowledge management, the number of respondents was relatively small because the main research approach was a qualitative method. It is generally accepted that qualitative researches are useful to grasp the contextual meanings and research participants'' meanings rather than to generalisation and pursuit of absolute truth. In order to consolidate the findings of this research, we recommend that the result of this study will be enhanced by

further qualitative research.

References

Ajmal, M., Helo, P., & Kekäle, T. (2010). Critical factors for knowledge management in project business. *Journal of Knowledge Management, 14*(1), 156-168.

Almeida, M. V., & Soares, A. L. (2014). Knowledge sharing in project-based organizations: Overcoming the information limbo. *International Journal of Information Management, 34*(6), 770-779.

Anbari, F. T., Carayannis, E. G., & Voetsch, R. J. (2008). Post-project reviews as a key project management competence. *Technovation, 28*, 633-643.

APM. (2009). *APM Body of Knowledge* (5th ed.): Association for Project Management.

Blair, J. (1997). Knowledge Management: The Era of Shard Ideas. *Forbes, 1*(1), 28.

Boh, W. F. (2007). Mechanisms for sharing knowledge in project-based organizations. *Information and Organization, 17*, 27-58.

Bowen, G. A. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods, 5*(3), 1-9.

Carrillo, P. (2004). Managing knowledge: lessons from the oil and gas sector. *Construction Management and Economics, 22*(6), 631-642.

Carrillo, P., & Chinowsky, P. (2006). Exploiting knowledge management: The engineering and construction perspective. *Journal of Management in Engineering, 22*(1), 2-10.

Carrillo, P., Robinson, H., Al-Ghassanni, A., & Anumba, C. (2004). Knowledge management in UK construction: strategies, resources and barriers. *Project Management Journal, 35*(1), 46-56.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory* (3e ed.). California, New Delhi, London, Singapore: Sage Publications.

Davenport, T. H., De Long, D. W., & Beers, M. (1998). Successful knowledge management projects. *Slogan Management Review, 39*(2), 43-57.

DeFillippi, R. J., & Arthur, M. B. (1998). Paradox in project-based enterprise: the case of film making. *California Management Review, 40*(2), 125-139.

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research* (4th ed.). Thousand Oaks, London, New Delhi: Sage Publications.

Disterer, G. (2002). Management of project knowledge and experiences. *Journal of Knowledge Management, 6*(5), 512-520.

Drucker, P. F. (1993). *Post-capitalist society*: Routledge.

Duffy, J. (2000). Knowledge management: To be or not to be? *Information Management Journal, 34*(1), 64-67.

Dunn, D. (2004). Knowledge-Based Competitive Advantage in the Internet Age: Discovering Emerging Business Strategies. *International Journal of Information Technology and Management, 3*(2/3/4), 246-258.

Gann, D. M., & Salter, A. J. (2000). Innovation in project-based, service-enhanced firms: the construction of complex products and systems. *Research Policy, 29*(7-8), 955-972. doi: 10.1016/s0048-7333(00)00114-1

Gant, R. (1996). Toward a Knowledge-based Theory of the Firm. *Strategic Management Journal, 17*(Winter Special), 109-122.

Gore, C., & Gore, E. (1997). Knowledge management: The way forward. *Total Quality Management, 10*(4 & 5), 554-560.

Hanisch, B., Lindner, F., Mueller, A., & Wald, A. (2009). Knowledge management in project environments. *Journal of Knowledge Management, 13*(4), 148-160.

Hobday, M. (2000). The project-based organisation: an ideal form for managing complex products and systems? *Research Policy, 29*(7-8), 871-893.

Huang, J. C., & Newell, S. (2003). Knowledge integration processes and dynamics within the context of cross-fuctional projects. *International Journal of Project Management, 21*(3), 167-176.

Kamara, J. M., Anumba, C. J., & Carrillo, P. M. (2002). A CLEVER approach to selecting a knowledge management strategy. *International Journal of Project Management, 20*(3), 205-211.

Keegan, A., & Turner, J. R. (2002). The management of innovation in project-based firms. *Long Range Planning, 35*(4), 367-388. doi: 10.1016/s0024-6301(02)00069-9

King, W. R. (2008). Knowledge management and organizational learning. *Omega, 36*(1), 167-172.

Liebowits, J., & Megbolugbe, I. (2003). A set of frameworks to aid the project manager in conceptualizing and implementing knowledge management initiatives. *International Journal of Project Management, 21*(3), 189-198.

Lindner, F., & Wald, A. (2010). Success factors of knowledge management in temporary organizations. *International Journal of Project Management, XX*(XX), XXX-XXX.

Love, P., Fong, P S. W., & Irani, Z. (2005). *Management of knowledge in project environments* (P. Love, P. S. W. Fong & Z. Irani Eds.). London: Elsevier.

Lubit, R. (2001). Tacit knowledge and knowledge management: The keys to sustainable competitive advantage. *Organizational Dynamics, 29*(4), 164-178.

Ly, E., Anumba, C. J., & Carrillo, P. M. (2005). *Knowledge management practices of construction project managers*. Paper presented at the 21st Annual ARCOM Conference, University of London.

Morris, P. W. G. (1997). *The management of projects* (Paperback edition ed.). London: Thomas Telford.

Newell, S., Brensen, M., Edelman, L., Scarbrough, H., & Swan, J. (2006). Sharing knowledge across projects: Limits to ICT-led project review practices. *Management Learning, 37*(2), 167-185.

Nonaka, I. (1991). The Knowledge-Creating Company. *Harvard Business Review, 69*(6), 96-104.

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company*. New York: Oxford University press.

PMI. (2009). *A Guide to the Project Management Body of Knowledge: PMBOK Guide* (4th ed.): Project Managenet Institute.

Schindler, M., & Eppler, M. J. (2003). Harvesting project knowledge: a review of project learning methods and success factors. *International Journal of Project Management, 21*(3), 219-228.

Tan, H. C., Carrillo, P., Anumba, C., Kamara, J. M., Bouchlaghem, D., & Udeaja, C. (2006). Live capture and reuse of project knowledge in construction organisations. *Knowledge Management Research & Practice, 4*, 149-161.

Tan, H. C., Carrillo, P. M., & Anumba, C. J. (2011). Case study of knowledge management implementation in a medium-sized construction sector firm. *Journal of Management in Engineering, 28*(3), 338-347.

Teerajetgul, Wasan, Chareonngam, Chotchai, & Wethyavivorm, Piyanut. (2009). Key knowledge factors in Thai construction practice. *International Journal of Project Management, 27*, 833-839.

Thiry, M., & Deguire, M. (2007). Recent developments in project-based organisations. *International Journal of Project Management, 25*(7), 649-658.

Turner, J. R. (2009). *The handbook of project-based management: leading strategic change in organizations* (3rd Ed.). London: McGraw-Hill.

Urquhart, C. (2013). *Grounded theory for qualitative research: A practical guide*. London: Sage.

van Donk, D. P., & Riezebos, J. (2005). Exploring the knowledge inventory in project-based organisations: a case study. *International Journal of Project Management, 23*(1), 75-83.

Wiewiora, A., Trigunarsyah, B., Murphy, G., & Coffey, V. (2013). Organizational culture and willingness to share knowledge: A competing values perspective in Australia context. *International Journal of Project Management, 31*(8), 1163-1174.

Wiig, K. M. (1997a). Knowledge Management: An Introduction and Perspective. *Journal of Knowledge Management, 1*(1), 6-14.

Wiig, K. M. (1997b). Knowledge Management: Where Did It Come From and Where Will It Go? *Expert Systems with Applications, 13*(1), 1-14.

Zhao, D., Zuo, M., & Deng, X. (2015). Examining the factors influencing cross-project knowledge transfer: An empirical study of IT services firms in China. *International Journal of Project Management, 33*(2), 325-340.