

Review

The effectiveness of knowledge sharing on projects: How companies prosper by what they know

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The topic focuses specifically on knowledge sharing on project team, specifically around project teams in the Information Systems (IS) sector. The paper review show knowledge sharing can be effective on IS projects, up to the point where the software is used by the business. A survey was conducted with participants who were actively involved in project teams. The focus was on key role-players, such as Project Managers, Business Analysts and Developers. The study established the knowledge sharing approaches on project teams and re-emphasised the importance of having a knowledge-sharing environment. Furthermore, the study proposed questions to understand the knowledge sharing approaches used on projects, how team members shared knowledge amongst each other, the systems they used to create a knowledge hub, the work environment which also including cultural aspects and also the types of rewards and recognitions that are in place at the workplaces. Despite the low volume of respondents some answers can be explored in further research, however serves as a platform for future studies to understand and assess knowledge sharing approaches.

Key words: Knowledge, Knowledge sharing (KS), Knowledge transfer (KT), Knowledge management (KM).

INTRODUCTION

Organisations have learnt the importance of knowledge as the major driving force behind organisation strategy that knowledge is a fundamental factor behind any organisation's success (Wiig, 1997). The emphasis on knowledge creation, development, organisation and advantage is the focus for improving society (Talebi and Galekandi, 2013). The purpose of this study is to investigate the different approaches to knowledge sharing and knowledge transfer on projects.

The study takes place in South Africa in the Western

Cape region and focuses on project teams in the Investment and electronic payment industries. The study focuses on which knowledge tools are used, and how these are measured for their effectiveness.

Value of study

The study explores the popular research areas of Knowledge Management (KM), Knowledge Sharing (KS) and

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Knowledge Transfer (KT). Thereafter, the study investigates how the research areas can be explored and utilised with efficacy in an Information Systems (IS) project environment. The study also highlights the barriers to the sharing of knowledge in IS-project teams. The study takes a closer look on knowledge sharing approaches that have been used with its challenges and compares knowledge sharing approaches within the team.

Research question

What are the most effective knowledge-sharing approaches for projects?

Literature review

In order to provide an informed view of this research, the literature review has been categorised into the various relevant headings. These are discussed below.

Understanding Knowledge

Knowledge is commonly acknowledged as an important economic resource in today's economy (Bou-Llugar and Segarra-Ciprés, 2006; Søndergaard et al., 2007). It is becoming increasingly evident that organisations should acquire knowledge that is useful and relevant, in order to retain their competitive advantage (Long et al., 2012). Knowledge management (KM) is defined as the exploitation and development of the knowledge assets of an organisation – with a view to furthering the organisation's objectives (Davenport et al., 1998). The bulk of knowledge management literature is primarily concerned with the role of information technology, however organisations that has information technology to manage explicit knowledge may have neglected more important and challenging tasks of facilitating the sharing and utilisation of tacit knowledge (Holste and Fields, 2010). Explicit knowledge is knowledge that is easy to transmit, and can be expressed in various communication mediums, such as words and numbers. Tacit knowledge is knowledge that is held implicitly in the minds of people, which is intricate to articulate, and requires observation, demonstration and experience for its transfer. Knowledge, whether tacit or explicit, is shared in a process, known as the "knowledge spiral". This process comprises four stages: socialisation, externalisation, combination, and internalisation ((Nonaka and Takeuchi, 1995)), where tacit knowledge is elicited, exploited and shared. There can be no growth for the organisation if there is no learning from knowledge that has been shared (Nonaka and Takeuchi, 1995). This would be detrimental to the organisational advancement, which could adversely affect strategy delivery, as well as customer perception and

brand integrity.

Knowledge Sharing and Knowledge Transfer

The terms Knowledge Sharing (KS) and Knowledge Transfer (KT) are often discussed by many authors interchangeably as the term "knowledge sharing" (Liyanage et al., 2009). Knowledge sharing is a people-to-people process (Ryu et al., 2003). It is a two-way process where individuals mutually exchange their knowledge. Knowledge transfer involves either actively communicating to others what one already knows, or actively consulting others, in order to learn what they know (Van Den Hooff and De Ridder, 2004). Knowledge transfer in organisations is about identifying knowledge that is accessible and acquire it to make things more efficient and effective in organisations. Therefore, Knowledge Sharing (KS) in organisations mostly involves exchange of knowledge at the individual level. Knowledge transfer in organisations is about identifying knowledge that is accessible, how to acquire and absorb it well and subsequently, how to make things more efficient and effective in organisations (Liyanage et al., 2009). Knowledge sharing is a daily process in an organisation. The above merely serves to formalise and structure this very basic but critical process.

Through the research, it became apparent that the two main categories of KS methods could be identified as people-engaging and systems-enabling methods ((Doctor, 2007; Ismond and Shiri, 2007). People-engaging methods results in tacit knowledge being shared amongst individuals, whilst systems-enabling methods enable the tacit knowledge to be elicited. Once this tacit knowledge has been captured, it is then shared at the organisational level promoting knowledge sharing provides users with more personalised, responsive and integrated information systems which is mutually beneficial both to the organisation and the users (Reneker, 2000). Workers on projects are at the forefront of a variety of new technologies and as a result must be supported by organisations by improving their intellectual capital and experiences. This in turn contributes to maximising competitiveness and innovativeness (Ling, 2011).

Knowledge transfer in a project team is important for accomplishing specific project tasks (Sandhu and Gunasekaran, 2004). It offers the opportunity to continuously improve the organisation's performance – through knowledge and organisational learning. Knowledge transfer (KT) is about exploiting accessible resources and also about how to acquire and absorb it to make things more efficacious (Liyanage et al., 2009). Transferred knowledge could easily change in shape, form and appearance from the source to the receiver, and a need to interpret the knowledge in a meaningful way. The nature of project teams is generally to move on after the success of a IS project, it is important to have a means to

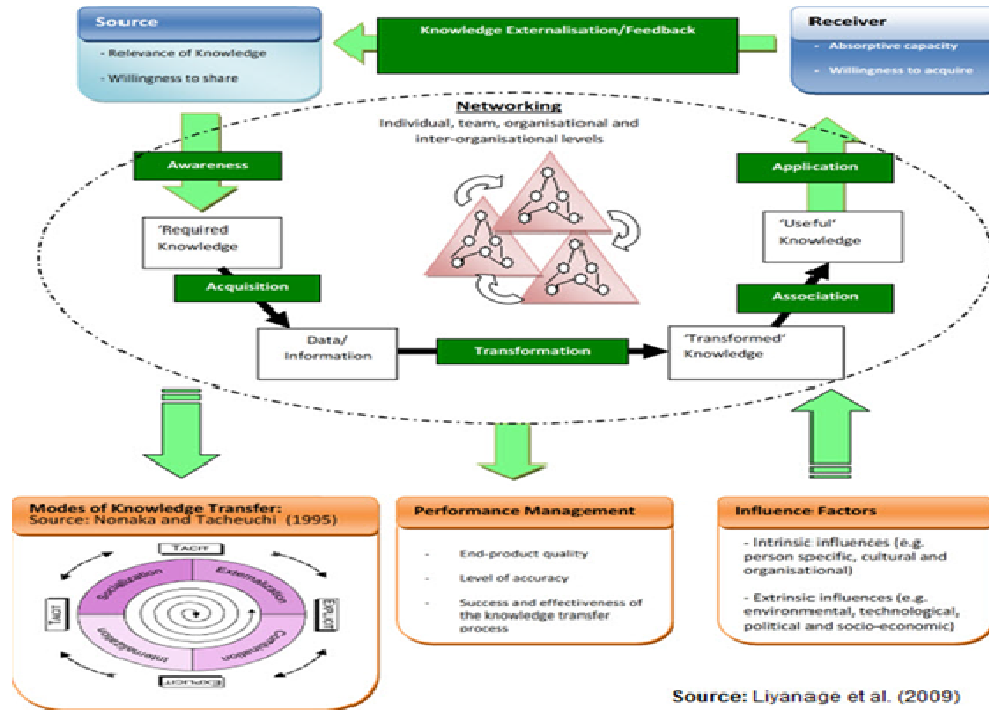


Figure 1: Knowledge transfer process adapted from Liyanage et al. (2009).

transfer knowledge.

Many consider explicit knowledge as equivalent to information, however recorded knowledge is argued to be richer than information as it is a reflection and the result of collated increments of information, which in this context is specific to a situation on which data has been collected and organised to give a meaningful interpretation about the specific situation (Kebede, 2010). Liyanage et al., (2009) proposed a six-stage KT process model (Figure 1) for knowledge transfer by looking at knowledge in two particular aspects: how knowledge is communicated and how it is translated throughout the knowledge transfer process – between the source and the receiver. The authors findings illustrate how the knowledge transfer loop is communicated by either interacting with people, or actively consulting others, in order to learn what they know. They also illustrate how knowledge is translated by transforming knowledge in a meaningful way into a form where the receiver can use it effectively.

Kumar and Ganesh (2009) have explored the diversity of the existing body of literature on knowledge transfer which can be utilised to identifying gaps in the organisations knowledge-transfer strategies. The researchers further provide in-depth view of the knowledge-sharing landscape, illustrating research on the different dimensions of knowledge sharing, knowledge-sharing cultures; effects on individuals and teams and organisations. It also serves as representations of the intricate flow of information, the mechanisms used, and the geographical

dimensions of knowledge sharing, especially when considering project team members. Furthermore, it is also to evaluate the knowledge sharing approaches to business performance as knowledge sharing approaches are becoming more complex rather than simple tasks (Carrillo et al., 2003).

Knowledge tools and knowledge-sharing measurements

Generally, knowledge is maintained by highly experienced or intelligent individuals, which are normally under pressure to deliver (Smith 2007). Workers on project teams are generally at the forefront of IS projects when there is an expectancy for specific deliverables on IS projects. Examples of knowledge sharing tools that are commonly used by organisations are online web tools, electronic database systems and expert locator systems. Supporting these knowledge tools are beneficial in an organisation (Smith 2007).

The literature reveals that knowledge tools and knowledge innovation for the organisation (Smith 2007). Most knowledge tools and knowledge portals yield positive impacts on knowledge sharing (Doctor, 2007; Koulouris and Kapidakis, 2005) Careful consideration must be given of the type of KM tool, because the technology tool alone cannot achieve the KM strategy (Endres et al. 2007). The measurement of these knowledge tools varies, in that they all serve

organisational strategies with specific objectives, depending on the level of intricacy that is required for the organisation's KM strategy.

Knowledge Barriers

Organisations, who want to maintain their competitive advantage, must do so by determining how people, the organisation structure and internal processes, stakeholder relationships and the business environment all relate to each other. Knowledge barriers can then be identified and eliminated in order to create an optimal knowledge-sharing environment (Paulin and Suneson, 2012). Knowledge transfer barriers that occur in organisations can be categorised into three types, namely: individual, organisational and technological barriers (Riege, 2007). Szulanski, (1996) mentioned four stages (*Initiation, Implementation, Ramp-up and Integration*) of KT to identify possible barriers during the knowledge-transfer process. Individual barriers can exist where there is a lack of any clear commitment and intent to create an environment that is conducive to knowledge sharing and also cultural incompatibilities (Dulaimi, 2007). The willingness of the individual to contribute to knowledge sharing could enable the organisation to improve its innovative capability (Lin 2007). Trust between individuals in an organisation can be both an enabler and a barrier to knowledge sharing; as a lack of trust might reduce the knowledge-sharing contributions made by the individuals (Søndergaard et al., 2007). Bakker et al., (2006) suggest that team membership has the largest effect on the density of knowledge sharing. Stakeholders' involvement is pivotal to the success of knowledge management (Sandhu and Gunasekaran, 2004) and lack of stakeholders' involvement could well lead to a failure in the knowledge-management strategy. The lack of engaging in best practices would not necessarily breed inventiveness that could deliver more effectively by sharing knowledge and expertise (Grisham, 2006; Perez-Araos et al., 2007). It is suggested that the KM strategy should best be integrated into the overall organisational strategy, thereby supporting ongoing organisational activities (Christensen 2007; Neumann and Tomé, 2011) Finally, technology alone cannot thrive without being nurtured by those who use it. The involvement of the users is pivotal to the success of knowledge management (Grisham, 2006). Furthermore, the alignment between process and information-sharing technologies is important for co-operative work on projects (Sandhu and Gunasekaran, 2004).

Research Design

The study is a quantitative survey conducted with project teams in organisations that offer business services in the Investment and electronic payments industries. The sampling group was randomly

selected people across business units, in order to measure the knowledge-sharing activities on projects. During the pilot phase of the questionnaire design, a greater percentage of participants indicated that they were not always privileged to have access to the internet. As a result, the questionnaire was retrofitted into an email questionnaire instead of an online survey tool and circulated to project teams. This resulted in a potential target sample of almost 100 participants, each with a specific role on a project. The email based survey received a 14 percent response rate in comparison to a targeted email survey study where only 20 percent response rate was received (Jackson & DeCormier 1999). The preference of an email questionnaire can be deemed as a limiting factor for response rates of the survey. However when reviewing previous research with the uptake between web questionnaires over email questionnaires, the results illustrate that web over email questionnaires are at a minimal advantage in terms of response percentages (Romano, 2002). Some authors have argued that web surveys are not an improved replacement to email questionnaires (Lippert, 2002; McDonald and Adam, 2003). Web surveys in itself held a small percentage of responses (Basi, 1999). Despite these limitations, we believe that our results do reflect important aspects in our understandings of knowledge sharing on projects and contributes to the body of knowledge. Similar studies regard the low response rate of surveys has contributed to their respect knowledge areas (Ha and McGregor, 2013; Isik et al., 2011; Ranchhod and Zhou, 2001; Sandweiss et al., 2012). The 14 responses received were from project managers, business analysts and developers, which translated to a response rate of 9.28% of the potential 100 participants. The proportion of respondents was males: 71% and females 29%, the majority of 71% being under the age of 40, whilst 29% where between the ages of 20-30 years. The majority of 86% had obtained a degree or diploma, with 14% having obtained a Honours or Master's degree. In terms of length of service, 65% of the respondents had been less than 3 years with the organisation; 7% between 4 and 7 years; 14% between 8-10 years; and 14% over 11years. These comprised a balanced combination of job function, as well as a permanent 57%vs contracted 43%employees. The respondents' job functions were split between 36% of Project Managers, 36% of Business Analysts and 28% of Developers.

Measurement

The survey was constructed into four main categories: people-centric knowledge-sharing methods, experience of project-team members, the system-enablement KS tools used, and the role played by trust and culture from an individual and organisational perspective. Subsequently, the open-ended questions allowed the participants to provide information that is tacit and not covered by the closed-ended questions. This was namely, what the participants' perception of knowledge sharing is; what tools and techniques are used in their current environment and how they perceive intellectual capital. All categories were measured using a 5-point Likert scale (Likert, 1932) to illustrate the views of the respondents, from strongly disagree to strongly agree.

Data Analysis

The majority of the questions were measured using a 5-point Likert scale (Likert, 1932), with only a few open-ended questions. The open-ended questions were to understand what the respondents interpretations were about knowledge sharing. To illustrate the general level of ratings, the median function was used to describe the measure of central tendency. To illustrate the most frequently rated score, the mode function was used. Thereafter, the vlookup function in Microsoft Excel was used to count the number of

respondents who scored the most frequently rated score, and this total was then divided by the total number of respondents – to indicate the percentage of the most frequently rated score. Furthermore, the mini- and maxi-functions were used to indicate the lowest and highest ratings scored from the data collected. The survey questionnaire was orchestrated because of the literature review, with the intent of addressing knowledge sharing indicators found in the literature review. The survey questionnaire was then segmented into various categories namely, knowledge sharing practices in teams, assessing if there was any specific software tools (e.g. knowledge portals, interwebs etc.), the use of system tools to share knowledge, to assess if there were any rewards and recognitions in place in the organisations for knowledge sharing, and lastly to assess the work environment and culture. The questionnaire is shown in Table 1, where it illustrates the most common rating, including the percentage of the most common rating of the respondents.

FINDINGS

The results indicated that there are knowledge-sharing processes to some extent. However, the culture of sharing knowledge was not well supported by management. This is an important aspect that can significantly improve knowledge sharing in organisations (Lin, 2007). The results indicated that there was a lack of mentorship and leadership, inadequate time, inadequate IT systems to support knowledge sharing, and a lack of appropriate reward and recognition. The survey also indicated that respondents were ambivalent towards the value and benefit of possessed knowledge and encouragement to establish relationships with internal and external knowledge sources. Five categories were identified that were attributed to knowledge sharing on projects, namely: knowledge sharing amongst team members, culture and trust associated with knowledge-sharing activities, system-enabled tools used amongst team members to share knowledge, rewards and recognition, and work environment.

Knowledge sharing in teams

Based on the findings, 72% of the respondents have agreed that their team members are supportive when creating and sharing knowledge which was supported by natural sharing habits that were evident. However, there was uncertainty on any existing mentorship and coaching to promote knowledge sharing including participation of contribution to knowledge sharing in forums and workshops for example. Another supporting finding is that 50% of the participants did not feel that there is sufficient time to share knowledge and adequate time to identify colleagues in need of specific knowledge. Neumann and Tomé, (2011) iterated the importance of KM strategies, and how it is incorporated as part of the main business strategy and that there are rewards and recognitions in place for efforts to contribute to the knowledge sharing activities.

Culture and trust

There is a 57% indication from respondents that the communication and interpersonal skills amongst their team members are at the right maturity level to share knowledge. Only 28.5% were neither in agreement or disagreement, which potentially indicates that the respondents were uncertain of the maturity of the communication and interpersonal skills amongst team members.

In regards to trustworthiness, 57% of the respondents were in agreement that they trust the individuals in their team and their transferred knowledge. But only 14.2% also strongly agreed with this statement; whilst 21.4% were in disagreement. The results indicate that 71.2% of the respondents collectively agreed that they were able to trust the knowledge of individuals in their team. Trust amongst team members are important to knowledge sharing contributions and can possibly limit knowledge sharing efforts (Søndergaard et al. 2007). A mere 35.7% acknowledged that there was a lack of willingness to share knowledge across organisational units within the same organisation.

System tools

43% of the respondents were in disagreement that there were the necessary IT systems and processes available in the organisation to support their knowledge-sharing requirements. 21% were in agreement that there were IT systems and processes for their knowledge requirements, whilst 21% were unsure if there were any IT systems and processes to meet their knowledge requirements. It has been found that system tools aid knowledge sharing efforts and has positive impacts on knowledge sharing activities (Ford 2006; Endres et al. 2007; Doctor 2007). Further investigation reveals that 14% were unsure in this instance. Only 14% were in agreement that there was any willingness to share, and only one was in strong agreement. There is an overall disagreement in terms of system-enabled tools being used to share knowledge amongst team members. 64% were in some form of disagreement as to having IT systems to facilitate knowledge sharing.

The lack of mentorship and leadership, rewards and recognition evident could be attributed to not having IT systems and tools in place to share knowledge, which is important to have in place for the KM strategy of an organisation (Sandhu and Gunasekaran, 2004).

57% of the respondents were in some form of disagreement on having IT systems and tools available to share knowledge. An opportunity to improve knowledge sharing efforts, must be founded with realistic expectations as technology alone cannot fulfil a KM strategy alone (Riege 2007; Ford 2006). The opened-ended question provided more specifics, since most of the respondents were using simple document

Table 1. Survey questionnaire

Constructs		Most Rated #	Most- Rated Rating	% no. of votes
Knowledge sharing in teams				
Q1	A natural knowledge sharing habit is evident in the team	1	Agree	50%
Q2	Sufficient time is available to establish contacts and encourage relationships with internal and external knowledge sources	1	Disagree	50%
Q3	Social networking happens amongst team members	0	Agree	43%
Q4	There is time to share knowledge, and time to identify colleagues in need of specific knowledge	1	Agree	43%
Q5	Team members are supportive by assisting their peers for knowledge sharing & creation	1	Agree	71%
Q6	There is a post implementation review after the project	1	Agree	43%
Q7	Team members partake in forums, workshops and meetings to share knowledge	1	Disagree	50%
Q8	Mentorship and coaching exist in adequate formats to promote knowledge sharing	1	Disagree	57%
Culture and Trust				
Q9	Communication and interpersonal skills amongst team members are at the right maturity level for knowledge sharing	1	Agree	57%
Q10	Individuals and their transferred knowledge is trustworthy	1	Agree	57%
Q11	There is an awareness and realisation of the value and benefit of possessed knowledge to others	-1	Agree	36%
Q12	Knowledge sharing activities are apparent across different cultures	0	Neither	36%
Q13	There is a willingness to collaborate across organisational units within our organisation	-1	Disagree	36%
System Tools				
Q14	IT systems and tools are available for knowledge sharing activities	1	Disagree	50%
Q15	IT systems and tools support people's work processes and actual communication flows	-1	Disagree	50%
Q16	People's knowledge requirements are met by the IT systems and processes available	-1	Disagree	43%
Q17	Usage of IT systems and tools promotes knowledge sharing.	1	Disagree	57%
Rewards and Recognition				
Q18	There is a reward system in place for creating reusable knowledge resources	-1	Disagree	50%
Q19	My performance appraisal is linked to the knowledge that I am sharing.	-1	Disagree	29%
Work Environment				
Q20	The environment in my team facilitates knowledge storage and retrieval	1	Agree	36%
Q21	The physical work environment and layout of work areas are conducive to knowledge transfer	-2	Strongly Disagree	29%
Q22	Formal and informal spaces are in place to collaborate, reflect and generate new knowledge	0	Neither	29%
Q23	Organisational culture supports knowledge sharing activities	-1	Disagree	50%
Q24	Knowledge retention rates of highly skilled and experienced staff are evident in the organisation	1	Agree	43%
Q25	Resources and infrastructure to successfully support knowledge transfer practices are evident in the organisation	1	Agree	36%

repositories to store and share the knowledge.

Rewards and recognition

The rewards and recognition questions yielded the lowest

ratings of all the questions in the questionnaire (means - 1.0 and -1.5). 86% where in some form of disagreement that there was a reward system in place for creating reusable knowledge resources in the project teams This could also be attributed to the lack of time available, and of system-enabling tools to share knowledge. Although

78% indicated that there was a natural knowledge sharing habit in the respective teams), there was 93% uncertainty and disagreement that knowledge-sharing habits are linked to performance appraisals, which indicates that there is a lack of management involvement promoting such knowledge-sharing habits.

Work Environment

57% of the respondents where in some form of disagreement that organisational culture supports knowledge sharing activities, 43% agreed that knowledge retention rates of highly skilled and experienced staff are evident in their organisation; whilst 21% were in disagreement; and 21% were uncertain. Dulaimi (2007) indicated the importance organisation culture in knowledge sharing activities, and how cultural incompatibilities can act as a barrier to knowledge sharing efforts.

Managerial and leadership aspects proved to be a hindrance to the sharing of knowledge. As many as 43% disagreed that there was a hierarchical structure that promotes knowledge to flow between teams and business units. Further investigation resulted in a total low score for this question. This indicates the importance of having a sound KM strategy incorporated into the main organisational strategy (Rhodes et al. 2008). Only 14% strongly disagreed; whilst 14% were uncertain. The results indicate a hindrance to knowledge sharing to occur between teams and business units. 57% disagreed to some extent that leadership and managerial direction are clearly communicated with the benefits and values of knowledge-sharing practices, whilst 21% were uncertain.

The results indicate that there is a lack of leadership from managers to clearly indicate the benefits and values of sharing knowledge. 50% collectively agreed that stakeholders are involved to support knowledge sharing on projects, whilst 43% disagreed in certain degrees that there was no stakeholder involvement. This indicates slight variance in the difference of opinion amongst the team members. This supports the importance that stakeholders' involvement is pivotal to the success of knowledge management (Sandhu and Gunasekaran, 2004). In addition, the open-ended questions regarding the understanding of what knowledge sharing is, the respondents who commented had an understanding that knowledge sharing must be shared and accessible to everyone in the organisation, with sound best practices in place. The majority of the respondents commented that most of the knowledge repositories were in file servers – with some using electronic document repositories, such as SharePoint and share-drives. It is also evident that the respondents utilised basic folder search tools to trawl through these repositories for explicit knowledge that had been captured and documented. The electronic document repositories provide somewhat of an easier interface to search through the knowledge repositories. Respondents

agreed that the intellectual capital belongs to the organisation, and felt that the knowledge that they were contributing belongs to their place of work.

DISCUSSION

The survey results indicate that there are sign of knowledge-sharing practices taking place in the workplace. However, there are opportunities for improvements to be implemented within project teams to promote effective knowledge-sharing habits. A similar study was also conducted across three teams within a healthcare organisation to attain a clearer understanding of knowledge exchange (Ward et al., 2012).

Overall, the results indicate that there is a strong presence of knowledge sharing amongst team members in the project teams by 72% of the respondents. The project teams involved felt that the knowledge that is shared is trustworthy and supported by mature and trustworthy individuals, which is indicated in the findings by 71%. This serves the organisation positively as the lack of trust could be a barrier to knowledge sharing (Søndergaard et al., 2007). There were no cultural issues evident that limited knowledge sharing in the teams, which is another positive factor as cultural barriers can limit knowledge sharing activities (McDermott 2001). 57% indicated the lack of leadership and 21.4% were uncertain. It is also evident that knowledge sharing across business units is not happening.

As the results have indicated, there is minimal or no leadership in place to drive knowledge-sharing initiatives. As seen in recent years, the majority of organisations are focusing on improving service delivery and customer experience. The Knowledge Management Strategy should have one of the key paradigm shifts of having not only a focus on the external customer – but to view internal customers (i.e. colleagues, cross-functional teams and members of other service-delivery areas as well) as key stakeholders.

What is suggested is that the organisation must consider all the factors and prioritise these as inputs to a comprehensive action plan. Another critical consideration is time management. Time is a critical currency, and it is recommended to use current meetings or forums – as opposed to creating more “meetings” for knowledge sharing. There seems to be a solid foundation of trust amongst team members as indicated in the results, and quick-wins would be to suggest to them how they believe the inadequate time factor as a risk could be mitigated.

This also creates many opportunities for mentoring, and once again, a proposal could be requested from the team members. In summary, people can work smarter and consequently, they could be happier. By giving them a problem to resolve, they feel as if they have been instrumental in finding the solution, which could lead to more buy-in. The organisation must realise the benefit of

having a knowledge-management strategy, timelines could be established to achieve the most effective knowledge-sharing approach in project teams. In the short-to-medium term, people-centric approaches could be explored to elevate the current knowledge sharing that is occurring in the project teams.

Limitations of this study

The limitations of this study was the low response rate because the majority of participants were contractors and deemed the survey as optional, and as a result the survey results cannot be generalised to all organisational contexts and populations. A similar article has been published with low response rates in an online survey (Isik et al., 2011). Organisations wishing to proceed with a survey of such nature for future studies, must understand the complexities and challenges involved and ensure participant involvement to attain more decisive results. The articulation and analysis presented in this study are our interpretation and our understanding of the survey results. In this regard, the study can be used as a basis for future conceptual generalisation studies. Hence, it needs to be clearly stated that this study cannot be generalised to the broader community.

Conclusion

The study reaffirmed that two knowledge-sharing approaches are identified as people-centric and system-enablement approaches. Each of these approaches varies in that each has a specific benefit to share knowledge and could be measured depending on which approach has been used. Barriers limiting effective knowledge sharing on projects could be related to these types, namely: individual, organisational and technological barriers and these could include issues, such as cultural differences and trust. The survey results have illustrated that there is a strong presence of knowledge sharing amongst team members in the project teams across the Investment and electronic payments industries, where it is also evident that knowledge-sharing activities could be improved by having leadership and mentorship role-players involved. There is evidence that personal performance does not encourage knowledge sharing, having minimal time allocated to share knowledge; and thus, the work environments are not ideally seen as knowledge-sharing hubs. Furthermore, some people are strongly individualistic, and do not want to share their knowledge with others. Future research opportunities which can be expedited with a larger participant group and across different industries, which will aid the results to be more explicit. The study provides opportunities for future research by utilising the survey as a litmus test for participant who wishes to research Small

Management Enterprises where knowledge sharing are more task orientated.

Conflict of Interests

The author(s) have not declared any conflict of interests.

REFERENCES

- Bou-Llusar JC, Segarra-Ciprés M (2006). "Strategic knowledge transfer and its implications for competitive advantage: an integrative conceptual framework", *J. Knowl. Manage.* 10(4):100-112.
- Carrillo PM, Robinson HS, Anumba CJ, Al-ghassani AM (2003). "IMPakT: A Framework for Linking Knowledge Management to Business Performance", 1(1):1-12.
- Davenport T, David W, Beers M (1998). "Successful knowledge management projects", *Sloan management review*, available at: <http://dialnet.unirioja.es/servlet/articulo?codigo=2498219> (accessed 15 September 2013).
- Doctor G (2007). "Knowledge sharing: developing the digital repository of SIPS", VINE, Emerald Group Publishing Limited, 37(1):64-73.
- Dulaimi MF (2007). "Case studies on knowledge sharing across cultural boundaries", *Engineering, Construction and Architectural Management* 14(6):550-567.
- Endres ML, Endres SP, Chowdhury SK, Alam I (2007). "Tacit knowledge sharing, self-efficacy theory, and application to the Open Source community", *J. Knowl. Manage.* 11(3):92-103.
- Ford NJ (2006). "The development and evaluation of an information technology support system to facilitate inter-organisational collaboration in HRD", *J. Eur. Ind. Train.* 30(7):569-588.
- Grisham T (2006). "Nurturing a knowledge environment for international construction organizations through communities of practice", *Construction Innovation: Inform. Process. Manage.* 6(4):217-231.
- Ha H, McGregor S (2013). "Role of Consumer Associations in the Governance of E-commerce Consumer Protection", *J. Internet Commer.* 12(1):1-25.
- Holste JS, Fields D (2010). "Trust and tacit knowledge sharing and use", *J. Knowl. Manage.* 14(1):128-140.
- Van Den Hooff B, De Ridder JA (2004). "Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing" 8(6):117-130.
- Isik O, Jones M, Sidorova A (2011). "Business intelligence (BI) success and the role of BI capabilities", *J. Int. J. Intell. Syst. Account. Finan. Manage.* 18(4):161-176.
- Ismond KP, Shiri A (2007). "The medical digital library landscape", *Online Inform. Rev.* 31(6):744-758.
- Kebede G (2010). "Knowledge management: An information science perspective", *Int. J. Inform. Manage.*, Elsevier Ltd, 30(5):416-424.
- Koulouris A, Kapidakis S (2005). "Knowledge Management Policies on Digital Content of Libraries".
- Kumar JA, Ganesh LS (2009). "Research on knowledge transfer in organizations: a morphology", *J. Knowl. Manage.* 13(4):161-174.
- Likert R (1932). "A technique for the measurement of attitudes." *Arch. Psychol.* 22(140):55.
- Lin H-F (2007). "Knowledge sharing and firm innovation capability: an empirical study", *Int. J. Manpower* 28(3/4):315-332.
- Ling C (2011). "Culture and Trust in Fostering Knowledge-Sharing", *Electronic J. Knowl. Manage.* 9(4):328-339.
- Lippert S (2002). "Social Dynamics in Information Systems Survey Research: A Comparison of Administration Media", *Issues Trends IT Manage. Contemp. Organ.* pp.462-466.
- Liyanage C, Elhag T, Ballal T, Li Q (2009). "Knowledge communication and translation – a knowledge transfer model", *J. Knowl. Manage.* 13(3):118-131.
- Long C, Ghazali N, Rasli A, Heng L (2012). "The Relationship between Knowledge Sharing Culture and Innovation Capability: A Proposed Model" 2(9):9558-9562.

- McDermott R (2001). "Overcoming cultural barriers to sharing knowledge", *J. Knowl. Manage.* 41(4):76-85.
- McDonald H, Adam S (2003). "A comparison of online and postal data collection methods in marketing research", *Market. Intell. Plann.* 21(2):85-95.
- Neumann G, Tomé E (2011). "The Changing Role of Knowledge in Companies: How to Improve Business Performance Through Knowledge", *Electronic J. Knowl. Manage.* 9(1):73-84.
- Nonaka I, Takeuchi TH (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press p.304.
- Paulin D, Suneson K (2012). "Knowledge Transfer, Knowledge Sharing and Knowledge Barriers-Three Blurry Terms in KM", *Electronic J. Knowl. Manage.* 10(1):81-91.
- Perez-Araos A, Barber KD, Munive-Hernandez JE, Eldridge S (2007). "Designing a knowledge management tool to support knowledge sharing networks", *J. Manuf. Technol. Manage.* 18(2):153-168.
- Ranchhod A, Zhou F (2001). "Comparing respondents of e-mail and mail surveys: understanding the implications of technology", *Market. Intell. Plann.* 19(4):254-262.
- Reneker MH (2000). "Enterprise knowledge portals: two projects in the United States Department of the Navy", *Electronic Libr.* 69(6):21-403.
- Rhodes J, Hung R, Lok P, Lien BY-H, Wu C-M (2008). "Factors influencing organizational knowledge transfer: implication for corporate performance", *J. Knowl. Manage.* 12(3):84-100.
- Riege A (2007). "Actions to overcome knowledge transfer barriers in MNCs", *J. Knowl. Manage.* 11(1):48-67.
- Romano MF (2002). "Determinants of Web mode choice in a 'Web and paper' survey in a high education population Diogene: a longitudinal survey on Pisa graduates" pp.1-8.
- Ryu S, Ho S, Han I (2003). "Knowledge sharing behavior of physicians in hospitals", *Expert Systems with Applications*, available at: <http://www.sciencedirect.com/science/article/pii/S0957417403000113> (accessed 15 February 2014).
- Sandhu MA, Gunasekaran A (2004). "Business process development in project-based industry A case study", *Bus. Process Manage. J.* 10(6):673-690.
- Sandweiss DR, Kadish H, Campbell K (2012). "Outpatient management of patients with bronchiolitis discharged home on oxygen: a survey of general pediatricians.", *Clin. Pediatr.* 51(5):442-446.
- Smith K (2007). "Supporting e-learning in enterprise: the TE3 project", *Education+Training*, Emerald Group Publishing Limited, 49(8/9):656-671.
- Søndergaard S, Kerr M, Clegg C (2007). "Sharing knowledge: contextualising socio-technical thinking and practice", *Learn. Organ.* 14(5):423-435.
- Szulanski G (1996). "Exploring internal stickiness: impediments to the transfer of best practice within the firm", *Management* 17:27-43.
- Talebi B, Galekandi WK (2013). "Knowledge Management Application in Research Management" 10:124-130.
- Ward V, Smith S, House A, Hamer S (2012). "Exploring knowledge exchange: a useful framework for practice and policy". *Soc. Sci. Med.* 74(3):297-304.
- Wiig KM (1997). "Knowledge Management: An Introduction and Perspective", *J. Knowl. Manage.* 1(1):6-14.