Knowledge Sharing In A Data Warehousing Project: An Investigation Into

The Dimensions Of What, When, And How Knowledge Is Shared

Rao Nemani, University of Minnesota, Minneapolis, USA.

ABSTRACT:

The knowledge sharing in a data warehouse (DW) project is important for managing knowledge for any organization and is critical for its survival. The purpose of this study was to examine the practices of knowledge sharing in terms of what, when, and how knowledge is shared in a DW project. The practices of knowledge sharing in a DW project through the dimensions of what, when, and how knowledge is shared was explored in a DW project. The study design was quantitative and used a web-enabled survey to collect data from 110 DW professionals using a single stage, cross-sectional approach. The study involved what, when and how knowledge is shared in a DW project from the participant's perspective as knowledge providers as well as knowledge receivers. It is expected that the research finding will provide DW managers with an insight into what, when, and how to best share knowledge for a successful DW projects.

Key Words: *Knowledge sharing, Knowledge management, Data warehousing, Knowledge acquisition, Project management*

---

1. Introduction

Knowledge is now recognized as an important component for competitive advantage, hence the organizations are making significant IT investments to leverage and manage organizational knowledge (Nidumolu et al., 2001). In today's knowledge society, success or failure can be determined by the accuracy and timeliness of information access or delivery. In order to support this organizational demand of information, organizations have a need to use data to produce intelligent reports to indicate the market trends and establish a competitive advantage (Groth, 1999, p. 56). Databases are used to store, manipulate, and retrieve data in every organization (Hoffer et al., 2002). The demand of database usage has been rapidly increasing for the past few decades and there was a greater need than before to put the data in a warehouse for a quicker retrieval. A data warehouse (DW) is a centralized database that captures information from different subject areas of an organization's business processes. In other words, a DW is a specially designed repository of data that is used by organizational decision makers (Wixom & Watson, 2001).

When individuals possess such information into their brain and apply it to take actions or make decisions then it will be considered as knowledge. Nonaka (1994) suggested that knowledge can be classified as tacit and explicit knowledge. Tacit knowledge deals with an individual's experiences and know-how. This type of knowledge is increasingly considered

as an important and valuable piece of information. This intangible resource is difficult to acquire and imitate. There are abundant studies on the knowledge sharing (KS) and knowledge management (KM) field. However, there are still opportunities for research on knowledge sharing in Data Warehouse (DW) projects.

Knowledge sharing has become so important that many accept that "the success of knowledge management in the organization depends on effective knowledge sharing practices" (Bhirud et al., 2005, p. 1). Scholars argue that "many a project would not have failed had there been an opportunity to learn from prior mistakes" (Ruuskas, 2005, p. 1). Current knowledge management practices are not effective for a practical knowledge sharing in corporate DW project (Nemani, 2010). These DW project are the basic components of an organizations success (Nemani & Konda, 2009 b).

The problem is the gap that exists between the theory and practice of knowledge sharing in a DW project. The practices of knowledge sharing in a DW project through the dimensions of what, when, and how knowledge is shared are to be examined. The first perspective is that of the DW project professional as the knowledge provider, and the second perspective is from the DW project professional as the knowledge receiver. Without effective knowledge sharing, DW projects are at risk of failing to complete in time and under budget. This will impact the organizations ability to conduct its business effectively and efficiently in the future as they need decision support systems to make informed decisions (Barnard, 2005). This research project will provide the DW managers with more insight into what kind of knowledge sharing practices can help them for the future DW projects.

2. Data Warehousing

Although data warehousing (DW) has only been explored for about a decade or two, many companies have recognized the overtly present results of implementing data warehousing in their businesses model. Even well-renowned companies such as Sears, Capital One, and Finnish Fur sales (Lee et al., 2004, p. 65) have reported a sustained increase in productivity and customer satisfaction by effectively implementing data warehousing (Nemani et al., 2009 c). Furthermore, the benefits of data warehousing in retail include: (a) more efficient promotional efforts, (b) increased sales volume, (c) increased profitability, (d) improved customer relationships, (e) improved vendor negotiations, and (f) improved inventory availability. The data warehousing in the retail industry is applied in three distinct divisions: promotions, vendors, and consumers. Another recent adoption for data warehousing is in the recent trend in retailers pursuing a macro-market analysis for better customer service.

3. What is Knowledge?

Knowledge is defined as the ability to remember previously learned material or information which range from interpreting specific facts to analyzing complete theories. When an organization is able to maximize and leverage their technical and business development resources, it will enhance the company's competitive advantage. Nonaka (1994) suggests that knowledge can be classified as tacit and explicit knowledge. Tacit knowledge deals with an individual's experiences and know-how. This type of knowledge is increasingly considered as an important type of information. This intangible resource is difficult to acquire and imitate. Therefore, it is regarded as the most important source

which could be within an individual or group, or an organization. In contrast, the explicit knowledge comes in the form of books, documents, white papers, databases, standards and policy manuals (Nonaka, 1994). Explicit knowledge also called leaky knowledge (Alavi & Leidner, 2001) because this explicit knowledge can leave an individual or an organization very easily.

4. Knowledge Sharing

The current state of knowledge sharing takes much of its theory from Polanyi (as cited in Nonaka et al., 2000) and then Nonaka (1994), who have proposed two types explicit, and tacit of knowledge (Benander & Benander, 2000; Best et al., 2003; Bhirud et al., 2005; Bouthillier & Shearer, 2002; Castelfranchi, 2004; Fedor et al., 2003; Hall, 2003; Jones, 2007; Kautz & Vendelo, 2001; Malhorta, 2000; Marwick, 2001; Ruuskas, 2005).

Sharing knowledge among members of an organization is a pivotal component of effective management of organizational knowledge. Individuals in any organization do not share their knowledge freely under all circumstances. These individuals need to be somehow motivated to create, share, and use knowledge (Davenport et al., 1998). This is the key factor for a successful knowledge sharing as the knowledge itself does not flow or grow on its own. Alavi and Leidner (2001) consider this knowledge sharing as one of the key processes in the overall knowledge management framework. Even the informal knowledge sharing in organizations can be very effective (Davenport et al., 1998). That is why knowledge sharing is essential for organizations and should be encouraged and rewarded (Nemani & Creason, 2009 a).

4.1. How Knowledge Is Best Shared?

The question of how to best share knowledge may be the greatest challenge to the theory of knowledge sharing. Besides establishing the foundations on the various classifications of knowledge, (Nonaka, 1994) also determined how knowledge sharing is most advantageously executed (Ackerman & Halverson, 2003; Barnard, 2005; Best et al., 2003; Binz-Scharf, 2003; Bures, 2003; Jones, 2007; Marwick, 2001; Ruuskas, 2005; Yoong & Molina, 2003).

4.2. When Knowledge Is Best Shared?

In order to extensively understand knowledge sharing in a DW projects, it is essential to explore when it is best to share knowledge in parallel to what and how aspects (Jones, 2007; Newell, 2004; Ruuskas, 2005). A large majority of the knowledge sharing in a DW project takes place in either a complimentary discussion or a post-project review. During a post-project review, all of the project participants are asked to write a systematic regression of their work and reports in order to uncover the “hidden assumptions” of their work (Newell et al., 2005, p. 8). The underlying purpose for any review session is to ensure that the foundations of a DW project were secure and to learn from past mistakes and prevent them in the future (Newell, 2004). However, recent studies on a DW project review process in most situations shows that it doesn’t produce enough codification (or externalization) because reviews are usually completed too late after the project. This erroneous timing causes business to lose a vast amount of tacit knowledge in addition to inaccurate

translation that could be constructive to the dynamic capabilities of the company (Newell, 2004).

5. Research Questions

There are different knowledge sharing types exist which include knowledge from an individual's skills and know-how, knowledge about the DW project tools and methods, knowledge about the DW project product ideas or design, knowledge from documents, databases, and manuals. Also, what types of knowledge sharing was carried out using both written and verbal forms of knowledge.

The research questions are (a) what types and forms of knowledge are shared in a DW project? There are different knowledge sharing types exist which include knowledge from an individual's skills and know-how, knowledge about the DW project tools and methods, knowledge about the DW project product ideas or design, knowledge from documents, databases, and manuals. Also, what types of knowledge sharing was carried out using both written and verbal forms of knowledge? (b) when is the proper time and space (Ba) for sharing each type and form of knowledge in a DW project? (c) what ways are used to share knowledge in a DW project?

6. Research Instrument

This survey examined the practices of knowledge sharing in a DW project with a specific emphasis on what, when, and how knowledge is shared. The main purpose was to collect data that can be statistically organized; a survey can be used to benchmark processes and behaviors as well as gaps in an organization. This study measured the responses in several formats: attribute, dichotomous (yes and no), multiple-choice, numeric, and Likert rating scale. For the Likert questions; the choices were as follows: *very high, high, little, very little, and I do not know*. Each Likert answer was assigned numeric values to facilitate the analysis of the responses.

The targeted population consists of members of The Data Warehouse Institute (TDWI). Participants were asked directly by TDWI to participate in a web-based survey. This study employed survey as a data collection instrument and further to examines how DW project professionals share their knowledge in a DW project. The study was a quantitative research and intended to explore various knowledge sharing practices used in a DW project. The data was collected through a structured questionnaire that consisted of 35 questions using a 5-point Likert scale to answer questions. The data was analyzed using SPSS statistical software in order to compute various descriptive statistics and compare means when testing the research questions.

7. Data Analysis

This section presents the descriptive analysis of the data collected in this study. Frequency tables of all the data collected are presented. There are three parts to this section that correspond to the three sections outlined in the survey instrument discussion presented earlier. The following tables present the descriptive statistics on the characteristics of the projects that supply knowledge to a DW project. The characteristics were measured in a DW project, and knowledge sharing practices.

Table 1: The Geographic Residences Of The Participants

	Frequency	Percent	Percent	Cumulative Percent
Australia/Pacific	1	0.9	0.9	0.9
South America	2	1.8	1.8	2.7
Asia	5	4.5	4.5	7.3
Europe	14	12.7	12.7	20.0
North America	88	80.0	80.0	100.0
Total	110	100.0	100.0	

Table 1 shows the geographic residences of the participants. The majority of the participants (80%) reside within North America. The second largest group (12.7%) resides within Europe. The third largest group (4.5%) resides within Asia.

Table 2: Participants' Years Of Experience As A DW Professional

	Frequency	Percent	Percent	Cumulative Percent
Less than 2 years	12	10.9	10.9	10.9
3 - 5 years	21	19.1	19.1	30.0
6 - 10 years	34	30.9	30.9	60.9
11 - 15 years	31	28.2	28.2	89.1
Greater than 15 years	12	10.9	10.9	100.0
Total	110	100.0	100.0	

Table 2 summarizes the participants' years of experience as a DW professional with the largest group (30.9%) indicating having 6-10 years of experience as a DW professional. The second-largest group (28.2%) indicated years of experience between 11 and 15 years, and the third-largest group (19.1%) indicated 3-5 years of experience.

Table 3: Summarizes The Participant's Various Industries

	Frequency	Percent	Valid Percent	Cumulative Percent
Banking	9	8.2	8.2	8.2
Consulting	12	10.9	10.9	19.1
Education/Training	5	4.5	4.5	23.6
Government	2	1.8	1.8	25.5
Healthcare	41	37.3	37.3	62.7
Insurance	15	13.6	13.6	76.4
Manufacturing	2	1.8	1.8	78.2
Other	8	7.3	7.3	85.5

Retail	5	4.5	4.5	90.0
Software	3	2.7	2.7	92.7
Technology	8	7.3	7.3	100.0
Total	110	100.0	100.0	

Table 3 summaries the participant's various industries. The largest group of participants (37.3%) indicated healthcare as their industry. The second largest group of participants (13.6%) indicated insurance as their industry. The third largest group of participants (10.9%) indicated consulting as their industry.

Table 4: Summarizes The Level Of Education Achieved By The Participants

	Frequency	Percent	Valid Percent	Cumulative Percent
High School Diploma / GED	1	0.9	0.9	0.9
Higher than Doctorate Degree	1	0.9	0.9	1.8
Bachelor Degree	1	0.9	0.9	2.7
Doctorate Degree	3	2.7	2.7	5.5
Some College	12	10.9	10.9	16.4
Bachelor Degree	41	37.3	37.3	53.6
Master Degree	51	46.4	46.4	100.0
Total	110	100.0	100.0	

Table 4 summarizes the level of education achieved by the participants. The largest group of participants (46.4%) indicated achievement of a master's degree. The second largest group of participants (37.3%) indicated achievement of a bachelor's degree. The third largest group of participants (10.9%) indicated that they had some college education but not enough to fulfill a bachelor's degree.

Table 5: DW Team Size

	Frequency	Percent	Valid Percent	Cumulative Percent
16 - 20 members	9	8.2	8.2	8.2
11 - 15 members	16	14.5	14.5	22.7
2 - 5 members	20	18.2	18.2	40.9
Greater than 20 members	21	19.1	19.1	60.0
Do Not Know	21	19.1	19.1	79.1
6 - 10 members	23	20.9	20.9	100.0
Total	110	100.0	100.0	

Table 5 shows that the group of participants (20.9%) had a DW project with 6-10 members. The second group (19.1%) had a DW project where the number of project members is unknown. The third group, also 19.1% of the population, had a DW project with more than 20 members involved.

Table 6: Primary Reason for Team Members Sharing Knowledge with You

		Frequency	Percent	Valid Percent	Cumulative Percent
	They want to educate me about products and services.	2	1.8	1.9	1.9
	I benefit from their knowledge.	5	4.5	4.6	6.5
	They genuinely want to help others learn.	5	4.5	4.6	11.1
	Of the relationship I have built with them.	6	5.5	5.6	16.7
	They want to help me do a better job.	7	6.4	6.5	23.1
	It makes their job easier.	11	10.0	10.2	33.3
	It is part of the organization culture.	14	12.7	13.0	46.3
	They want to help the DW project succeed.	58	52.7	53.7	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 6 summarizes the primary reason why the DW team members share knowledge with them. The largest group (53.7%) showed that the main reason for knowledge sharing was to help the DW project succeed. The second largest group (13%) indicated that the main reason was because it's part of the organization culture. The third largest group (10.2%) indicated that the main reason was because it made their job easier. Two participants chose not to answer this question.

Table 7: Primary Reason Why You Share Knowledge With Team Members

		Frequency	Percent	Valid Percent	Cumulative Percent
	To educate them about products and services.	4	3.6	3.7	3.7
	Of the personal relationship they built	4	3.6	3.7	7.4

	with me.				
	It makes my job easier.	8	7.3	7.4	14.8
	It is part of the organization culture.	9	8.2	8.3	23.1
	Others can benefit from my knowledge.	15	13.6	13.9	37.0
	I want to help them do a better job.	26	23.6	24.1	61.1
	I want to help the DW project succeed.	42	38.2	38.9	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 7 summarizes the participants' primary reason why they share knowledge with the DW team. The largest group (38.9%) showed that the main reason for knowledge sharing was to help the DW project succeed. The second largest group (24.1%) indicated that the main reason was to help other team members do a better job. The third largest group (13.9%) indicated that the main reason was others could benefit from the knowledge. Two participants chose not to answer this question.

Table 8: Most Effective Way of Sharing Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
	In the conference call	1	.9	.9	.9
	Via Instant messenger	2	1.8	1.9	2.8
	Via web based conference	2	1.8	1.9	4.6
	If other, please specify	3	2.7	2.8	7.4
	Via e-mail	11	10.0	10.2	17.6
	Documents or reports	16	14.5	14.8	32.4
	In the Project Team Meeting	19	17.3	17.6	50.0
	In Person	54	49.1	50.0	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 8 summarizes the participants' most effective way of sharing knowledge with other DW project members. The largest group of participants (50%) indicated that they share knowledge with other members in person. The second largest group (17.6%) indicated that most effective way of sharing knowledge was in the project team meeting. The third largest

group (14.8%) indicates that they share with other members through documents or reports. Two participants chose not to answer this question.

Table 9: How Effective Was The Knowledge Sharing Process

		Frequency	Percent	Valid Percent	Cumulative Percent
	Do not know	4	3.6	3.7	3.7
	Not Effective	5	4.5	4.6	8.3
	Very effective	6	5.5	5.6	13.9
	Neutral	23	20.9	21.3	35.2
	Effective	70	63.6	64.8	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 9 indicates how much effective the knowledge sharing process was. The largest group of participants (64.8%) showed that knowledge sharing was very effective. The second group (21.3%) indicated that knowledge sharing was neither effective nor ineffective. The third group (5.6%) showed that knowledge sharing was very effective. Two participants chose not to answer this question.

Table 10: Proximity Between Team Members

		Frequency	Percent	Valid Percent	Cumulative Percent
	A significant distance (International)	2	1.8	1.9	1.9
	Within flying distance (1 to 4 hours)	4	3.6	3.7	5.6
	A significant distance	4	3.6	3.7	9.3
	Within driving distance (local)	7	6.4	6.5	15.7
	Within flying distance	7	6.4	6.5	22.2
	Within talking distance	20	18.2	18.5	40.7
	Within walking distance	64	58.2	59.3	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 10 indicates how much close the physical proximity was between the participants and other DW team members. The largest group of participants (59.3%) showed that other team members were within walking distance. The second group (18.5%) indicated that the

team members were within talking distance. The third group (6.5%) showed the team was within flying distance. Two participants chose not to answer this question.

Table 11: How Often The Knowledge Is Shared With Other Team Member

		Frequency	Percent	Valid Percent	Cumulative Percent
	Several times per month	4	3.6	3.7	3.7
	At least once per month	9	8.2	8.3	12.0
	At least once per week	19	17.3	17.6	29.6
	Several times per day	21	19.1	19.4	49.1
	Several times per week	22	20.0	20.4	69.4
	At least once per day	33	30.0	30.6	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 11 indicates how much the participants shared knowledge with other team members. The largest group of participants (30.6%) showed that knowledge was shared at least once per day. The second group (20.4%) showed that knowledge was shared several times per week. The third group (19.4%) showed that knowledge was shared several times per day. Two participants chose not to answer this question.

Table 12: How Was Knowledge Shared

	Count	Column N %
Other	2	2.1%
The knowledge was shared by virtual means in written form to one individual	50	52.1%
The knowledge was shared one-on-one during a face-to-face interaction	67	69.8%
The knowledge was shared by virtual means in written form to a large number of people	68	70.8%
The knowledge was shared in a group or collective during a face-to-face interaction	73	76.0%

Total	96	100.0%

Table 12 summarizes how the knowledge was shared during knowledge sharing. The largest group (76%) shared knowledge through a face-to-face interaction. The second group (70.8%) shared knowledge through virtual means in written form. The third group (69.8%) shared knowledge by one-on-one personal interaction. The variable in this table was a multiple response where the participant could select all choices that applied.

Table 13: How A Team Member Shared The Knowledge

	Count	Column N %
Expertise locater / organization yellow pages	2	2.1%
Other	5	5.2%
Community of practice or purpose	12	12.4%
Wiki	16	16.5%
Calendar & Scheduling, Task Management	27	27.8%
Lessons learned and best practices repositories	36	37.1%
Instant Messaging, White Board, Application Sharing, Video or Telephone Conferencing	38	39.2%
Shared Project Repositories	40	41.2%
Document and content Management	59	60.8%
Email, Message Board, Discussion Board	80	82.5%
Total	97	100.0%

Table 13 summarizes how knowledge was shared. The largest group (82.5%) indicated that e-mail, message board, or discussion board was used to share knowledge. The second-largest group (60.8%) indicated that the knowledge sharing method was document and content management. The third-largest group (41.2%) indicated that shared project repositories were how knowledge was shared. The variable in this table was a multiple response where the participant could select all choices that applied.

Table 14: What Type Of Knowledge Was Shared

	Count	Column N %
Other	2	2.1%
Knowledge from documents, databases, and manuals	68	70.1%
Knowledge from an individual's skills and know-how	76	78.4%
Knowledge about the project's or organization's tools and methods	76	78.4%
Knowledge about the project's product ideas or design	79	81.4%

Total	97	100.0%

Table 14 summarizes what types of knowledge were shared. The largest group (81.4%) indicated that the type of knowledge shared was about the project's product ideas or design. The second group (78.4%) indicated that the type of knowledge shared was about the projects or organization's tools and methods. The third group (also 78.4%) indicated that the type of knowledge shared was about the individual's skills and know-how. The variable in this table was a multiple response where the participant could select all choices that applied.

Table 15: What Stage The Knowledge Was Shared

	Count	Column N %
Project Support Stage	42	43.3%
Project Implementation Stage	45	46.4%
Project Testing Stage	54	55.7%
Project Initiation Stage	62	63.9%
Project Planning Stage	72	74.2%
Project Requirements Gathering Stage	76	78.4%
Project Development Stage	77	79.4%
Project Design Stage	82	84.5%
Total	97	100.0%

Table 15 summarizes when and at what stage of the project does knowledge sharing occur. The largest group (84.5%) shows that knowledge sharing occurs during the project design stage. The second group (79.4%) shows that knowledge sharing occurs during the project development stage. The third group (78.4%) shows that knowledge sharing occurs during the project requirements gathering stage. The variable in this table was a multiple response where the participant could select all choices that applied.

Table 16: What Form Of Knowledge Was Involved

	Count	Column N %
Both	90	81.8%
Verbal	11	10.0%
Written	9	8.2%
Total	110	100.0%

Table 16 summarizes what form of knowledge sharing was involved. The largest group (81.8%) indicated that both written and verbal forms of knowledge sharing were involved. The second group (10%) indicated that the written form of knowledge sharing was involved. The last group (8.2%) indicated that the verbal form of knowledge sharing was involved. The variable in this table was a multiple response where the participant could select all choices that applied.

8. Discussion

This section reports various characteristics of knowledge sharing practices of the sampled participants in a DW project. The frequency tables specify the various knowledge sharing practices in a DW project. Most participants in the study have 3 to 5 years experience in a DW field, and have worked in healthcare at a large organization. The participant organizations have experience in knowledge management, and knowledge management was used in their projects. The most prevalent project team size was between 6 to 10 members. Generally, the practice of knowledge sharing utilized almost equal amounts of written and verbal forms of knowledge. The most used type of knowledge was contained in email, message board, discussion board, document, content management, and shared project repositories. This discovery of knowledge sharing was considered an effective experience in a given DW project. The next chapter provides a brief discussion of the results, contributions to the literature, limitations of this study, recommendations for future study, and a general conclusion of the research.

The survey indicated several results about the participant's background and experience. Most of the participants in this study were experienced DW professionals and also worked in the technology industry at large organizations. Furthermore, these organizations mostly utilized knowledge management in some projects. The most common project team size was between 6 to 10 members. In most cases, both written and verbal forms of knowledge were equally exercised during knowledge sharing. Documents, databases, and manuals were their most prevalent medium of knowledge sharing sent via email.

9. Research And Practical Implications

Building on past research, this study is helpful to researchers in developing a more comprehensive model of knowledge sharing in a DW project setting. There are some practical implications of this study. The concept of knowledge sharing appeared to be complex in two dimensions. First knowledge sharing in interpersonal contact, such as in meetings, communities or a telephone call, is quite different from knowledge sharing by codifying the knowledge in databases that can be accessed by anybody with the right kind of connection. Secondly, providing knowledge is not the same as seeking knowledge and the conditions promoting these behaviors are overlapping but not identical. Assessing knowledge sharing behavior and conditions should take into account these differences. This suggests that we need to further explore and understand the motivational (Nahavandi & Malekzadeh, 1999, p. 31) factors of the knowledge provider and knowledge receiver. The descriptive characteristics reported by the participants in this study can be applicable to DW projects and may be useful for DW practice managers.

10. Assumptions And Limitations

Even though this study has limits on its scope, it is expected to provide a foundation for future studies in knowledge sharing in a DW project. A typical DW project team consists of members with different expertise and backgrounds, which makes the use of information technologies (IT) and sharing knowledge a challenging task (Newell, 2004). This study is based on the following assumptions:

(a) Knowledge sharing is a voluntary act, and (b) motivations for knowledge sharing and hoarding are complex and multi-faceted. There were several limitations of this study and they are: (a) one methodological limitation of this study was that it was exploratory and inductive research, (b) another methodological limitation was that the study may have been vulnerable to the threat of single-source. The participants were drawn from only one professional organization named “The Data Warehouse Institute” (TDWI). This is important because they may be different in the knowledge sharing practices of other project professionals not represented by TDWI, and c) this is a quantitative study using survey questions to gather knowledge sharing practices from DW project professionals. As with all studies using this method, a key assumption of this study is that the subjects were telling the truth while answering the survey questions.

11. Recommendations For Future Research

Previously stated as a limitation, the population size can be increased to ensure more comprehensive results. Furthermore, by incorporating different industries into the sample size the study will have a greater breadth of results. Different industries may utilized alternative methods for knowledge sharing that suits the requirements of that particular industry. Secondly, future studies may choose to distribute the survey through several channels instead of a single organization such as TDWI. Consequently, this would lead to a more diverse sample size and would provide more extensive results. Prospective studies could explore the correlation between successful projects and failed projects. For instance, there may be a difference in the methods of knowledge sharing for successful projects compared to failed projects. This can provide the link for critical knowledge sharing methods that may lead to DW project successfulness.

12. Conclusions

It is clear that knowledge sharing in an integral part of any successful business structure. Moreover, the methods of knowledge sharing also play an important role in the organization's culture and competitiveness. Through this study finding, organizations can make critical decisions on how knowledge is shared during each phase of a DW project. These decisions may enable the project to become more successful simply due to the method of knowledge sharing for a particular project phase. Ultimately, understanding the characteristics of knowledge sharing can provide powerful decision making and planning factors. The company's as well as company’s DW project success may even be detrimental if knowledge sharing is not adequately addressed and utilized.

13. References

Ackerman, M. S., & Halverson, C. (2003). *Sharing expertise: the next step for knowledge management*. Irvine, CA: Irvine.

Alavi, M., & Leidner, D. E. (2001). Review: knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly, 25*(1), 107-136.

Barnard, Y. F. (2005). Developing industrial knowledge management: Knowledge sharing over boundaries. *Proceedings of the International Conference on Advances in the Internet, Processing, Systems and Interdisciplinary Research, 1*(1), 1-6.

Benander, A., & Benander, B. (2000). Data warehouse administration and management. *Information Systems Management, 17*(1), 71.

Best, R. G., Hysong, S. J., McGhee, C., Moore, F. I., & Pugh, J. A. (2003). An empirical test of nonaka's theory of organizational knowledge creation. *E-Journal of Organizational Learning And Leadership, 2*(2), 1-27. Retrieved from http://www.leadingtoday.org/weleadinlearning/rboct03.htm

Bhirud, S., Rodrigues, L., & Desai, P. (2005). Knowledge sharing practices in KM: A case study in Indian software subsidiary. *Journal of Knowledge Management Practices, 6*(6), 1-13.

Binz-Scharf, M. C. (2003). Bureaucratic networks or networked bureaucracies? Knowledge sharing in ICT-enabled innovation projects (NCDG Working Paper No 03-012). Retrieved from http://www.ksg.harvard.edu/digitalcenter/Research/working_papers/binzscharf_NCDG_03-012.pdf

Bouthillier, F., & Shearer, K. (2002). Understanding knowledge management and information management: the need for an empirical perspective. *Information Research, 8*(1), 1-26.

Bures, V. (2003). Cultural barriers in knowledge sharing. *E + M Economics and Management, 1*(6), 57-62.

Castelfranchi, C. (2004). Trust mediation in knowledge management and sharing. *Proceeding Series: Lecture Notes in Computer Science*, 1-15.

Davenport, T., DeLong, D., & Beers, M. (1998). Successful knowledge management projects. *Sloan Management Review, 39*(2), 43.

Fedor, B. D., Ghosh, S., Caldwell, S., D, Maurer, T., J, & Singhal, V., R. (2003). The effects of knowledge management on team members' ratings of project success and impact*. *Decision Sciences, 34*(3), 513.

Groth, R. (1999). *Data mining: Building competitive advantage* (2nd ed., Rev. ed.). Upper Saddle River, NJ: Prentice Hall.

Hall, W. P. (2003). Organizational autopsies and knowledge management. *12th International Conference on Information Systems Development, 1*(12), 26-27.

Hoffer, J. A., Prescott, M. B., & McFadden, F. R. (2002). *Database environment. In B. Horan (Ed.), Modern Database Management* (6th ed., ed.). Upper Saddle River: Prentice Hall.

Jones, C. R. (2007). *Exploring the practices of knowledge sharing between projects: An investigation of the dimensions of what, when, and how knowledge is shared.* Ph.D., Capella University, United States -- Minnesota. Retrieved from http://proquest.umi.com.library.capella.edu/pqdweb?did=1400960991&Fmt=7&clientId=62763&RQT=309&VName=PQD

Kautz, K., & Vendelo, M. T. (2001). Knowledge sharing as spontaneous order: on the emergence of strong and weak ties. *Seminar on Technology Reuse and Knowledge Sharing In Software Firms, 1*(1), 1-37. doi: http://doi.acm.org/10.1145/903893.903896

Lee, S. M., Hong, S., & Katerattanakul, P. (2004). Impact of data warehousing on organizational performance of retailing firms. *International Journal of Information Technology & Decision Making, 3*(1), 61-79.

Malhorta, Y. (2000). Knowledge management for e-business performance. *The Executives Journal, 16*(4), 5-16.

Marwick, A. D. (2001). Knowledge management technology. *IBM Systems Journal, 40*(4), 814.

Nahavandi, A., & Malekzadeh, A. (1999). *Organizational behavior: The person–organization fit*. Englewood Cliffs, NJ: Prentice-Hall.

Nemani, R., & Creason, S. (2009 a). Research Methodologies used in Knowledge Management: A literature Review. *Proceedings of the 4th Annual Midwest Association for Information Systems (MWAIS),* 22-23 May 2009, Madison, South Dakota, USA.

Nemani, R., & Konda, R. (2009 b). A Framework for Data Quality in Data Warehousing. *Proceedings of the 3rd International United Information Systems Conference,* UNISCON, Sydney, Australia, 20(1), pp. 292-297.

Nemani, R., Konda, R., & Nemani, J. (2009 c). Key Factors for an Effective Quality Assurance in Data Warehousing. *Proceedings of the American Society for Quality's (ASQ) Silicon Valley" Conference,* Oct 23rd 2009, Santa Clara, CA.

Nemani, R. (2010). The Role of Computer Technologies in Knowledge Acquisition. *Journal of Knowledge Management Practice,* Vol. 11, No. 3.

Newell., S. (2004). Enhancing cross-project learning. *Engineering Management Journal, 16*(1), 12.

Newell, S.H., Swan, J., & Galliers, R. (2005). Sharing learning through documents: Conflicting outcomes. *Proceedings of the 38th Hawaii International Conference on System Sciences, 1*(1), 233b.

Nidumolu, S. R., Subramani, M., & Aldrich, A. (2001). Situated learning and the situated knowledge web: Exploring the ground beneath knowledge management. *Journal of Management Information Systems, 18*(1), 115-150.

Nonaka. I (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*(1), 14-37.

Nonaka, I., von Krogh, G., & Ichijo. K (2000). *Enabling Knowledge Creation*. New York: Oxford University Press

Ruuskas, I. (2005). *Social structures as communities for knowledge sharing in projectbased environments.* Ph.D., Helsinki University of Technology, Helsinki. Retrieved from http://lib.tkk.fi/Diss/2005/isbn9512276712/

Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS Quarterly, 25*(1), 17-41.

Yoong, P., & Molina, M. (2003). Knowledge sharing and business clusters. *7th Pacific Asia Conference on Information Systems, 1*(7), 1224-1234.

About the Author:

Dr. Rao Nemani is an Adjunct Instructor at University of Minnesota, Carlson School of Management, Minneapolis, MN, USA where he teaches Information Technology Management courses to MBA students. Rao received his Ph.D. in Organization & Management from Capella University, Minneapolis, MN, USA. Rao received his Master of Informational Technology from Swinburne University of Technology, Melbourne, Australia. Rao had spent over 25 years in the business and technology area. His research interest includes knowledge management, strategic management, data warehousing & data mining, Business and IT alignment.

Dr. Rao R. Nemani, University of Minnesota, Carlson School of Management, 321 Nineteenth Ave. S., Minneapolis, MN 55455, USA; Tel: 952-412-9277; Fax: 952-412-9277; Email: Neman017@UMN.Edu

---