Demographics Factors and Knowledge Sharing Behavior Among R&D Employees

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ABSTRACT

Knowledge sharing among the employees is one of the important elements in knowledge management. However, previous studies have indicated that employees are reluctant to share knowledge among themselves. The purpose of this study is to report the findings of a study regarding demographics variables and their impact on R&D employees' knowledge sharing behaviors. The results indicated that demographic variables are not significant predictors of R&D employees' knowledge sharing behaviors.

Keywords

knowledge sharing, knowledge management, tacit, explicit, demographics, gender, race, job position, work experience, organizational tenure, job tenure

1.0 INTRODUCTION

Managing knowledge has become an important agenda for most organizations ever since the concept of knowledge management entered the business world, sometime just before the turn of the millennium. In this new era, knowledge is recognized as one of the organization's most important resources. Hence, organizations have been trying to glean whatever advantage that they can get by using knowledge.

In general, knowledge management is the process of capturing, storing, sharing, and using knowledge (Davenport & Prusak, 1998). From the business perspective, knowledge management is defined by Bergeron (2003) as "a deliberate, systematic business optimization strategy that selects, distills, stores, organizes, packages, and communicates information essential to the business of a company in a manner that improves employee performance and corporate competitiveness" (pg. 8). Based on these two literatures, it has been acknowledged that the sharing or communication of knowledge is an essential element in the knowledge management process.

Furthermore, according to Gold, Malhotra, and Segars (2001) many organizations have realized that effective knowledge sharing is crucial to enhance their core competencies and gain competitive advantage. In fact, Bartol and Srivastava (2002) pointed out that organizations have started to realize that knowledge sharing is critical to knowledge creation, organizational learning and performance achievement.
Unfortunately, previous studies have indicated that employees in general are reluctant to share knowledge (Michailova & Husted, 2003; Wang, 2004). Therefore, there is a need to find out who among the people in the workforce have a higher tendency to share knowledge. It is the purpose of this paper to discuss the findings of a study regarding the demographic factors and their relationships to employees' knowledge sharing behavior.

2.0 LITERATURE REVIEW

2.1 Knowledge Sharing Behavior

Knowledge sharing has been defined in several different but similar ways by different researchers. In general knowledge sharing has been defined as the action of individuals in making knowledge available to others within the organization (Ipe, 2003). Similarly, Bartol and Srivastava (2002) viewed knowledge sharing as the sharing of organizationally relevant information, ideas, suggestions, and expertise with one another.

Even though most studies defined knowledge sharing at the individual level as a single dimension construct, there are also those who proposed a two dimensions perspective. For example, according van den Hooff and de Ridder (2004)

knowledge sharing process consists of 'donating' and 'collecting' aspects of sharing. Other researchers, such as Ipe (2003) and Koskinen, Pihlanto, and Vanharanta (2003) acknowledge the differences of tacit and explicit knowledge sharing. Hence, in this study knowledge sharing behavior refers to the act of communicating and disseminating one's acquired job-related knowledge, either explicit or tacit, with other members within one's organization.

2.2 Explict vs. Tacit Knowledge Sharing

It is commonly agreed that disseminating and communicating explicit knowledge is easier than sharing of tacit knowledge (Ipe, 2003). Sharing of tacit knowledge, is more challenging (Hendriks, 1999) because according to Koskinen et al. (2003), tacit knowledge represents "knowledge based on the experience of individuals. It expresses itself in human actions in the form of evaluations, attitudes, points of view, motivation, and etcetera. Usually it is difficult to express tacit knowledge directly in words and often the only way of presenting it is through metaphors, drawings and different methods of expression not requiring a formal use of language" (pg. 218). As such, the tacitness of knowledge is a natural impediment to the successful sharing of knowledge between individuals in organization (Ipe, 2003).

Sharing of explicit knowledge is much easier because it can be done by means of books, manuals, video clips, databases and expert system, as well as through formal training. Therefore, the sharing of explicit knowledge requires very little encouragement for it to happen. Yet, by no means can it be neglected. Sharing of explicit knowledge is beneficial to the organization because it can improve employees' ability to complete their work more efficiently in terms of time (Hansen & Haas, 2001).

On the other hand, tacit knowledge sharing is argued to be a product of socialization and dialectic debate among employees (Fernie, Green, Weller, & Newcombe, 2003) and it requires face-to-face interactions (Fernie, et al., 2003; Koskinen, et al., 2003). Furthermore, as proposed by Selamat and Choudrie (2004), the diffusion of tacit knowledge requires organizations to encourage the development of individual's meta-abilities, i.e. personal, acquired abilities that underpin and determine how and when knowledge will be practiced within the organization. Thus, sharing of tacit knowledge requires a lot effort and determination.

Nonetheless, tacit knowledge sharing is important to the organization because a study by Hansen and Haas (2001) revealed that it improves quality of the employees work outcomes and it signals competence to clients. Furthermore, as Selamat and Choudrie (2004) pointed out in their literature review, the presence of explicit knowledge is meaningless without tacit knowledge to augment it. This is because only with tacit knowledge that we can put the explicit knowledge into practice.

2.3 Demographic Variables and Knowledge Sharing

The effect of demographic variables on job related behaviors has undergone rigorous examination, but the results are still inconclusive (eg. Ehigie & Otukoya, 2005; Kidder, 2002). Where knowledge sharing is concerned, there are studies that look into the effect of demographic variables, but the number is still small. One of them is a study by Miller and Karakowsky (2005) who looked into knowledge sharing behavior within mixed gender teams doing gender biased task. In essence, they found that there are differences between men and women in their effort to seek for knowledge. In a different study, Lin (2006) found that women are more willing to share knowledge because they are more sensitive to instrumental ties and due to the need to overcome traditional occupational hurdles. Lin's (2006) finding confirms an earlier finding by Irmer, Bordia, & Abusah (2002) who also reported that women indicated that they gained more benefits from knowledge sharing. These findings implied that there is a possibility that women might want to share more knowledge compared to men because they want to be perceived as more knowledgeable and thus providing them more opportunities to further their career. Nonetheless, there are also studies reported that gender did not have a significant impact on knowledge sharing (Chowdhury, 2005; Ojha, 2003; Watson & Hewett, 2006).

Besides gender, age is another variable that has been studied. Unfortunately, according to Ojha (2003) and Watson and Hewett (2006) indicated that it did not effect knowledge sharing. Regardless of these findings, as an employee gets older, they have more experience, and no study reports the effect of work experience on knowledge sharing behavior. However, Collin (2004) reported that among the design engineers, the more experienced employees often act as a mentor to the less experienced employees. Through this form of relationship knowledge is shared and transferred from one individual to another.

In fact, the study by Ojha (2003) found that organizational tenure has a significant impact knowledge sharing, but the relationship was negative. This is in contrast to the finding of most studies which reported that organizational tenure was a significant and positive predictor of knowledge contribution (Irmer *et al*., 2002; Watson & Hewett, 2006). Organizational tenure is important in fostering knowledge sharing behavior because the longer an employee works for a certain company, the more knowledge that he or she has acquired, and hence he or she would feel more obligated towards the

organization to ensure that the organization would benefit from it through knowledge sharing. In fact, it is argued here that job tenure could also be an important predictor of knowledge sharing behavior. Unlike organizational tenure, which indicates the length of time an employee has been working for the organization, job tenure indicates the length of time an employee has been in a certain position. The longer a person is at a certain position, the more comfortable he or she is with the knowledge that he or she possess in relation to that job, and therefore, the more he or she is able to share the knowledge with others.

However, where job position is concerned, Ardichvili, Maurer, Wentling, and Stuedemann (2006) found that not only the top manager, but the middle-level managers were also not participating in knowledge sharing efforts. This means job position also did not have an impact on knowledge sharing behavior. This is in contrast to the finding of Collin (2004) who indicated that senior employees often acted as a mentor to much younger employees. In fact, in most cases, in a mentoring relationship, where knowledge sharing often occurs (Sackmann & Friesl, 2007), the mentors are often employees from higher positions.

Currently, no studies reported on the effect of ethnicity on knowledge sharing behavior, but in the Malaysian culture, this could be a differentiating factor. This is due to what is known as 'losing face'. The concept of losing face is associated with the loss of dignity, prestige and dignity (Cardon, 2006). Preserving face is important in the Malaysian culture regardless of race (Abdullah & Low, 2001). Where sharing knowledge is concerned, Malaysians in general, are afraid of losing face which could occur when we make mistakes and receive negative feedback, even though we are not sure that we will be getting one (Abdullah & Low, 2001). Furthermore, the idea of giving and receiving praise also makes some of us feel ill at ease. Therefore, when it comes to sharing knowledge, some of us can be quite reserve in expressing our ideas and opinions, much less voluntarily offering our knowledge to other people.

Unfortunately, it is not known whether there are differences in the importance of preserving face with regard to ethnicity, among the Malaysians, and hence, it is not known whether race will affect knowledge sharing behavior. Still, Sackmann and Friesl (2007) found that when working in teams, ethnicities affects knowledge sharing in a negative way. In addition to that, where organizational citizenship behavior is concerned, a study by Jones and Schaubroeck (2004) indicated that, race did have an effect on the behavior. Hence, there is a possibility that different ethnic group might show different tendencies in terms of knowledge sharing behavior.

Other than that, marital status and level of education were also reported not to influence knowledge sharing among the software development engineers (Ojha, 2003). In short, not many studies on knowledge sharing behavior focus on demographic differences. Therefore, the effects of demographic factors on knowledge sharing behavior are still not definitive. However, in general the findings of some studies have implied that certain demographics variables do have an impact on employees' knowledge sharing behaviors. Hence, in this study it was hypothesized that:

H1: There are significant differences between (a) male and female, between (b) races, and between (c) job positions with regard to knowledge sharing behavior

H2: Demographics variables (a) age, (b) work experience, (c) organizational tenure and (d) work tenure, have significant relationships with employees' knowledge sharing behavior.

3.0 RESEARCH METHODS

3.1 The Respondents

The target population for this study encompassed employees of research and development (R&D) companies who are involved in R&D projects. This study purposely chose this group of employees because R&D is a knowledge intensive work (Swart & Kinnie, 2003), and therefore, for these people knowledge sharing is crucial to ensure the success of their projects. In order to reach these people, companies that conduct R&D or have a R&D department were contacted. 426 companies were contacted, but only 93 agreed to participate in the study. Subsequently, a total of 533 questionnaires were distributed to these employees with the assistance of the firms' human resource managers. Respondents were required to mail the completed questionnaires directly to the researcher using the self-addressed envelopes that were provided. Respondents were given three weeks to complete the questionnaires. However, two weeks after the due date, only 140 (26.27%) were returned to the researcher. Of this, only 114 questionnaires (21.39%) were used for data analysis.

Of the 114 respondents, a majority were males (63.2%). The respondents in this sample were from various ethnicities. The percentages for the Malay and Chinese respondents were almost equal (48.2% and 43.0% respectively), while the rest of respondents were Indians and other races (8.7%). A majority (79.8%) of the respondents has at least a bachelor's degree. A total of 41.2% were managers, while the rest are at the non-managerial positions (58.8%). The mean age of the respondents is 31.93 years (SD=7.75 years). On the average, the respondents have 8.01 years of work experience (SD= 6.91 years). The mean organisational

tenure is 5.48 years (SD= 5.68 years) whilst the mean for job tenure was 3.53 years (SD=3.73 years).

3.2 Data Collection Instruments

In this study, knowledge sharing behaviour was conceptualized as the extent to which one communicate and disseminate one's acquired job-related knowledge, either explicit or tacit, with other members within one's organisation. This construct was measured using 8 items that were adapted from the studies by Jaw and Liu (2003) and Bock, Zmud and Kim (2005). The items from Bock et al., (2005) were originally used to measure individuals' intention to share explicit and tacit knowledge. Therefore, some modifications were made to the items in the scale so that they reflect individuals' actual behaviour of sharing knowledge. For this purpose, the words "I will" or "I intend" in the original items were replaced with "I often". Responses to the items were made on a 5-point scale (1= strongly disagree to 5= strongly agree).

A principal component analysis with varimax rotation was conducted on the measurements for knowledge sharing behaviours. Two factors emerged as a result from the factor analysis of the knowledge sharing behaviour scale, with an eigenvalue of above 1. Two items were dropped due to high cross-loadings. These two components were named 'tacit knowledge sharing' (TKS) and 'explicit knowledge sharing' (EKS). The items for TKS include "I often share my experience or know-how from work with other organisational members", "I often share my expertise from my education or training with other organisational members", "in my organisation, I would express my opinion actively", and "I often exchange ideas with organisation members from daily social life and informal meetings". On the other hand, the items for EKS are "I often share my work reports and official documents with members (*e.g. co-workers who have to produce similar reports or documents*) of my organisation", and "I often provide my manuals (*e.g. technical books or notes regarding work*), methodologies (methods for completing a certain job) and models (*examples from previously completed projects*) for members in my organisation". A reliability tests conducted on the TKS and EKS items indicate a reliability coefficient of 0.80.

4.0 RESULTS AND DISCUSSION

The conceptual development has lead to the prediction that there is a difference between male and female employees in levels of KSB. However, as displayed in Table 1, results from this study indicated there is no significant difference in the overall knowledge sharing behavior, and EKS behavior. Nonetheless, there is a slight difference between male and female in terms TKS behavior. Results indicated that male have a higher tendency to share tacit knowledge compared to female. Thus, H1a is only partially supported.

With regard to the differences between races, the only significant differences that are visible are between the Malay and the Chinese people in terms of TKS behavior and between the Chinese and the Indians and other races in terms of overall knowledge sharing behavior. The results indicated that the level of TKS behavior is higher among the Malay employees compared to the Chinese employees, and the level of knowledge sharing is higher among the Indian employees and other races compared to the Chinese. This means that H1b is also partially supported. However, where job position is concerned, there is no significant difference between the managerial and the non-managerial employees in their tendency to share knowledge in general, and also for both TKS and EKS behavior. Hence, H1c is not supported.

Table 1: Results of t-test

Variables compared	N	KSB		TKSB		EKSB	
		Mean	t-value	Mean	t-value	Mean	t-value
Gender							
Male	74	3.93	1.53	3.95	2.11*	3.90	0.62
Female	42	3.76		3.40		3.82	
Race							
Malay	55	3.93	1.81	3.95	1.98*	3.90	1.81
Chinese	49	3.73		3.70		3.76	
Malay	55	3.93	0.80	3.95	0.45	3.90	1.13
Indian & others	10	4.10		4.05		4.20	
Chinese	49	3.73	2.01*	3.70	1.69	3.76	1.78
Indian & others	10	4.10		4.05		4.20	
Job position							
Managerial	47	3.90	0.96	3.92	1.20	3.88	0.23
Non-managerial	49	3.79		3.77		3.85	

* Statistically significant at $p<0.05$

Table 2 shows the inter-correlations coefficients (r) among variables, which were calculated by means of Pearson's Product Moment. The results indicated that age, work experience, organizational tenure and job tenure did not have a significant relationship with any of the knowledge sharing behavior variables. Hence, H2 is not supported.

Table 2: Correlation between variables

	Variables	1	2	3	4	5	6
1	Age (years)	1					
2	Working experience (years)	.879**	1				
3	Organization tenure (years)	.827**	.783**	1			
4	Job tenure (years)	.718**	.549**	.715**	1		
5	Tacit KSB	.007	.011	-.079	-.028	1	
6	Explicit KSB	-.034	-.069	-.047	-.056	.452**	1
7	KSB	-.009	-.021	-.078	-.044	.926**	.755**

** Correlation is significant at the 0.01 level (2-tailed).

5.0 DISCUSSION AND CONCLUSION

Although the conceptual development of this study has lead to the prediction that the demographic variables would have a differential and significant impact on employees' knowledge sharing behavior, the results were mainly not significant. One reason that explains this result is that the study was conducted among R&D employees, whereby it is possible that knowledge sharing is an important aspect of their day to day activities. As such, factors such as age, job position, experience and tenure did not have a significant impact on their knowledge sharing behavior.

Still, this study shows a difference by gender in terms of TKS behavior, whereby men shared more tacit knowledge compared to women. This is in contrast to the previous finding by Irmer *et. al.* (2002) and Lin (2006), who indicated that women share more than men. The finding of the current study is very interesting because even though generally, man and women did not differ in their KS behavior, they do differ in terms of TKS behavior. As discussed, sharing of tacit knowledge is more difficult compared to sharing of explicit knowledge. It requires more direct interaction between individuals. Sharing of tacit knowledge occurs more among men most probably because during their social interactions, men discuss more about their work as compared to women. Therefore, it is possible that during these interactions that they share knowledge with each other.

The findings also showed that the Malay share more tacit knowledge compared to the Chinese, and in general the Indians and other races shared more knowledge compared to the Chinese. One reason that contributes to this situation maybe due to the fear of loss of face that permeates among the Chinese society (Cardon, 2006). Although, preserving face is important in the Malaysian culture regardless of race (Abdullah & Low, 2001), it is possible that this feeling is stronger for the Chinese compared to the other races. In other words, Chinese respondents may perhaps perceived that the act of sharing information with others may reveal their own weaknesses.

Other than that no other differences were found and it can be concluded that demographic factors did not play a major role in the knowledge sharing behavior among R&D employees. Nevertheless, it is interesting to find out whether the findings could be different in other types of jobs for example among physicians, attorneys, public officers etc.

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