AN EXAMINATION OF THE QUALITY OF TACIT KNOWLEDGE SHARING THROUGH THE THEORY OF REASONED ACTION

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ABSTRACT

Knowledge is information and understanding gained through experience, some of this professional knowledge of an employee is recorded and documented among the organization's files and databases (explicit knowledge), professional experience, know how, know why are held back in the minds of employees (tacit knowledge). This tacit knowledge when appropriately shared can become vital source of quality products/ services and innovation.

Knowledge sharing is hampered when individuals are not motivated enough to come forward and share their professional experiences, to obtain high quality of knowledge sharing one needs to understand the motivations (intentions) behind it. Theory of Reasoned Action (TRA) helps us comprehend them. It states that intentions are function of person's attitude and subjective norms which collectively help form intentions.

Data regarding the knowledge sharing intentions of 209 Information Technology (I.T) professionals from more than 70 I.T companies registered with PSEB located in 5 major cities of Pakistan was obtained. Using Structured Equation Modeling (SEM) technique, the TRA model showed a good fit with the researched data. The I.T professionals show their intent towards sharing tacit knowledge and this intent is mostly influenced by the subjective norms towards sharing knowledge and less by their personal attitude.

Key Words: *Knowledge Management, Quality of Tacit Knowledge Sharing, Information Technology, Theory of Reasoned Action, Structured Equation Modeling.*

1) INTRODUCTION

Knowledge is the human understanding of a particular field of interest that has been attained through training, observing and experiencing. Data and information which is encoded, stored and disseminated is known as content component of the knowledge more popularly as **Explicit Knowledge**. The experience, situation, conditions as perceived by owner of the knowledge is the context component of knowledge, usually termed as the **Tacit Knowledge**. Nonaka (1994) defines knowledge as information and understanding gained through experience which inherently resides within individuals. Knowledge is classified as explicit or tacit; explicit being the documents and records within the organization and tacit being the know-how and experience of the knowledge worker.

Tacit knowledge is like riding a bicycle which cannot be learnt by having it explained by someone; it can only be learnt through personal experimentation. Another example of tacit knowledge is demonstrated in the case study of Matsushita Electric Industrial Company. This firm wants to develop a bread machine but cannot replicate the dough-kneading process. The professional's baker's tacit knowledge which resides in the minds and the special movements are difficult to be articulated. Although a team of software developers are working on replicating it but they keep on failing. They finally succeed when one of the developers volunteers to be an apprentice to an expert baker. The combination of explicit and tacit knowledge is used to finally develop a quality product (Nonaka, 1985).

Sharing knowledge is an activity by which knowledge is exchanged among people. The difficulty with sharing of tacit knowledge is that sharing is voluntary act and sharing of quality knowledge by knowledge workers is only possible if individuals are willing to share. Organizations might design the best knowledge management systems to capture knowledge but if individuals are not motivated, the efforts would be wasted. To obtain quality knowledge sharing individual's perspective needs to be understood. The **Theory of Reasoned Action** helps us understand this individual behavior. The theory states that individual's behavior is triggered by the intentions and intentions are formulated by the kind of attitude one has towards a specific behavior and the approval of the important others for that specific behavior. (Ajzen, 1988). Similarly we are also guided by the saying of the Prophet Mohammad (PBUH) "Actions are a result only of the intentions of the actor…." (Mohammad,

2009). This famous quotation signifies the importance of intentions in our behavior.

The arrangement of the this article is as follows: Section I is introduction, section II is introduction to knowledge sharing, importance of knowledge sharing, theory of reasoned action, and quality of knowledge sharing and is presented which is followed by section III on theoretical back ground covering empirical research articles on knowledge sharing intentions and behavior. The fourth section describes the research model which is followed by the methodology section. The sixth section covers the descriptive results, measurement results and structural results. Finally the article is concluded by some discussion and recommendations.

1.1) Knowledge Sharing

Knowledge sharing can be defined as a process of conveying knowledge from a person to another and also to collect shared knowledge through information and technology (Hwie Seo *et al.*, 2003). To knowledge sharing there are antecedents to consider which encourage or restrain knowledge sharing. Personality, Attitude, Work Norms, Vocational Reinforces, Organizational Culture, Policies and Strategies are some of the impediments to knowledge sharing (Awad *et al.*, 2004). Riege (2005) lists three dozen of these barriers which need to be addressed in order to implement a knowledge management strategy. One way to understand the effect of these barriers is through the Theory of Reasoned Action (TRA). TRA helps us understand the cognitive process of formation of intentions and it has been successfully used in numerous studies to understand intentions and predict behavior (Sheppard *et al.*, 1998). In recent years, a number of studies have used TRA to understand the sharing behavior among different professionals and knowledge workers.

Helmstada (2003) says that sharing is a voluntary act, therefore a lot depends on the individuals beliefs. When the individual believes that sharing is good and beneficial for organization and is aware that he/she will be recognized and given credit for his/her contribution then the knowledge worker will initiate sharing. The knowledge worker will also share when he believes that the top management is supportive of this behavior and there exists a culture of sharing knowledge. So we realize that capturing tacit knowledge is a complex issue, effort at the organizational level, individual level and technological level is required.

Developing of innovative systems, access to organizational resources and development of a sharing conducive culture is a must!

1.2) Importance of Sharing/Capturing Tacit Knowledge

The mobility of work force is a constant threat and a challenge for management. Retaining its knowledgeable worker and the knowledge has become top priority. Some organizations have started activities to capture knowledge one such example is of Xerox which maintains the record of best practices and in result made substantial saving (Brown *et al.*, 2000). British petroleum initiates a project of virtual teamwork to promote knowledge sharing which has five- to-one returns within six months (Ives *et al.*, 2007). Young professionals after gaining vital experience in a company either look for another local company or go abroad. Developing a system which makes sharing of knowledge a routine aspect of work enables the organizations to capture vital knowledge and reuse it where needed. Technologies based firms like Ford Motors, Hewlett Packard, Chevron have taken the initiative to capture individuals tacit knowledge, store it and reuse it enhancing revenues and cutting costs (Sveiby, 2001).

1.3) Theory of Reasoned Action and Quality of Knowledge Sharing

Researchers and psychologist believe that by studying intentions they can predict behavior and take appropriate measures in order to obtain desired results (Figure 1). Fishbein and Ajzen frame TRA in 1975 which states that an individual's level of behavior is determined by intentions to carry out the behavior and intentions are jointly determined by an individuals' attitude (A) and subjective norm (SN) concerning the behavior. The attitude (A) is the positive or negative evaluation of self performance of a particular behavior. SN is an individual's perception about the particular behavior which is influenced by judgment of significant others like boss, colleagues, mentor, friends, parents (Ajzen and Fishbein, 1980). The same can be tested for knowledge sharing behavior. Positive attitude towards sharing tacit knowledge and the perceptions of the norms for tacit knowledge sharing forms the intentions to share knowledge.
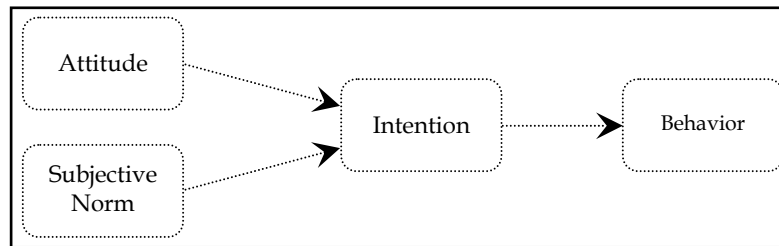
Figure 1: Theory of Reasoned Action simplified Model

1.3.1) Quality of Tacit Knowledge sharing:

The difficulty in the sharing of tacit knowledge is mostly due to the fact that knowledge is created by human, and one cannot be forced to share it. Van den Hoof et al. (2004) lists two impediments to knowledge sharing intentions (motivation) to share knowledge and the ability to share knowledge. Understanding the barrier can help us to take corrective measures, resulting in higher quality of knowledge sharing. The knowledge management process can successful solve problems when the quality of knowledge is ensured (Tongchuay *et al*, 2008). So we define Knowledge Quality as the knowledge which is shared is timely, is accurate, is complete, is consistent and is relevant. To satisfy all these criterions the contributor has to be motivated in order to deliver quality.

Using the TRA one can postulate that intentions (motivations) towards tacit knowledge sharing, the intentions are formed by individual's positive attitude towards sharing and the perception that the important others support the concept of sharing tacit knowledge. It is only then an individual would be inclined to share high quality of tacit knowledge.

Braun (2005) recommends the uses the theory of planned behavior which is the based on theory of reasoned action in order to understand the motivational level development of intentions. The paper indicates that a positive attitude and the perception of other's approval of knowledge sharing results in enhancing the quality and quantity of knowledge sharing.

Our paper is fore mostly focuses on measuring intentions level for sharing tacit knowledge among I.T professional. Secondly it explores knowledge sharing intent formation through the Theory of Reasoned Action. Following are the research questions addressed:

1) What is the extent of Intent for Sharing Tacit Knowledge in I.T professionals?
2) Do attitude and subjective norms towards tacit knowledge sharing influence intention to share tacit knowledge?

2) THEORETICAL BACKGROUND

Literature review on the issue of Knowledge Sharing Intentions indicates TRA/TPB[1] as one of the leading theories in understanding and predicting behavior in general and more specifically in knowledge sharing. Bock *et al*. (2005) conducts research to find the effects of extrinsic motivators, social psychological forces and organizational climate on the behavioral intention in knowledge sharing. The researcher uses TRA framework as a base model to study Intentional attitude and the study reveals that attitude and subjective norm are positively related and the subjective norm influences the formation of attitude for sharing knowledge. Shin et al. (2008) using TRA model, studies intentions to share knowledge among academicians in Malaysian university. The findings show that attitude and subjective norms has a positive effect on intentions to share. The role of attitude is higher than the subjective norm and this is attributed to individualistic nature of academicians. Seewon *et al*. (2003) studies sharing behavior of physicians in hospitals through TRA and TPB. The study compares the results of both the models and finds that both models exhibiting acceptable model fit indices with TPB being superior to TRA. Chennamaneni (2006) using TPB, identifies that the knowledge sharing behavior can be predicted by intentions and perceived behavioral control. Yang 2006) using Theory of Planned Behavior has identified that descriptive norm has a positive effect on tacit knowledge sharing intention but shows no support for tacit knowledge sharing behavior and identified situational factors such as conducive communication mechanism and availability of resources which can facilitate the behavior. Overall most of studies conducted showed good support for TRA/TPB theories on predicting behavior in general and knowledge sharing in particular.

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[1] Theory of Planned Behavior

3) RESEARCH MODEL

Quality of knowledge sharing is possible when humans have motivation (Intention) to share. Intentions to share tacit knowledge are formed by attitude and subjective norms. Higher the attitude higher the intentions to share tacit knowledge. The more there is support by the significant others in the organization for sharing tacit knowledge the higher the intentions, this support would also indirectly effect the attitude formation as well, which in turn would help formulate positive intentions. The researchers have drawn the following research model (Figure 2) and with hypothesis given below:
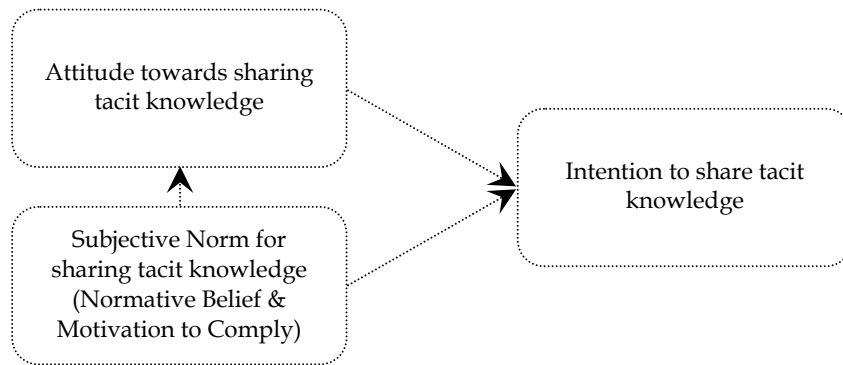
Figure 2: Research Structural Model

H1: The higher the attitude towards tacit knowledge sharing the higher the intentions to share tacit knowledge.

H2: The higher the subjective norm of tacit knowledge sharing the higher the intentions to share tacit knowledge.

H3: The higher the subjective norm the higher the attitude to share tacit knowledge

4) RESEARCH METHODOLOGY

4.1) Scope of the Study

The study is limited to understanding and measurement of the intentions to knowledge sharing as suppose to the actual behavior. Presently tacit knowledge management initiatives are in rarity and few knowledge management systems exit in this part of the world. Observing and

measuring tacit knowledge sharing behavior is not possible thus the research has been constrained to the study of intentions formation.

For the study the researchers have considered the I.T professional who are either software developers or systems/network support engineers. These individuals gain experience while working on different projects and resolving client's problem. I.T managers are avoided as managers generally desire to promote an environment where employees help each other and share knowledge. I.T professionals who are with the industry for 4 to 5 years were encouraged as they have gained some vital experience who have trainings on latest technologies and have the first hand experience of working on these technologies. They are the future source of the vital tacit knowledge.

4.2) Study Design

Primary data on the intentions, attitude and subjective norms on tacit knowledge sharing are obtained. The population for the study is the I.T staff working in approximately 1000 software firms which are registered with Pakistan Software Export Board[2]. Most of these software companies function in the five cities of Pakistan namely Islamabad, Karachi, Lahore, Faisalabad and Abbottabad. 375 questionnaires are distributed to more than 70 software firms. A 5-point Likert scale anchored by "strongly disagree" (1) to "strongly agree" (5) is used. It is ensured that not more than 3 responses per firms are obtained. The questionnaires are personally delivered to the management and they are requested to get these filled by I.T professionals. The respondents are given adequate time to reply and responses are collected back on a convenient time.

To analyze the model the researchers have used the multivariate analysis technique known as Structural Equation Modeling (SEM). This approach is chosen because of its ability to test casual relationships between constructs with multiple measurement items (Jorekog, 1996).It allows separate relationships for each set of dependent variable. SEM has the facility to analyze complex models in a unified manner as compared to the traditional regression model (Gefen *et al*, 2000). SEM specific technique developed by Wold (1989) which is based on two stage model testing the Measurement Model and Structural Model (Path Model).

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[2] www.pseb.org/search.php.

Measurement model helps define the latent variables conducts correlations, factor analysis and model fitness on latent variables. Structural Model defines linear relationship between latent variables and provides with path coefficients of the model.

There are two kinds of variables observed and latent variables while working in SEM. Observed variables are directly measured where as latent variables are measured through the observed variables. There are two sub categories within latent variables known as exogenous and endogenous variables. A latent variable is endogenous when it is a dependent variable or moderating variable. A latent variable is exogenous when it is an independent variable and not affected by any other variable. In our research model "Intention to Share Tacit Knowledge" is an endogenous latent variable and "Subjective Norm for Sharing Tacit Knowledge" is a latent exogenous variable. "Attitude to Share Tacit Knowledge" is a mediating variable therefore we classify it as an endogenous latent variable which is affected by "Subjective Norm to Share Tacit Knowledge". Actual items of the instrument act as the observed variables. SEM allows allocating individual error terms to all of the variables except for the exogenous variable.

4.3) Scale/Instruments

For this study validated instrument is adapted from previous published research. Bock et al, (2005) instrument on Attitude to share knowledge. Subjective Norms for sharing knowledge and Intention to share knowledge instrument is adapted. The instrument is also pretested by a group of I.T professionals who are asked to evaluate the instrument for its language appropriateness and the flow of the questions. A pilot study of 50 I.T professionals is conducted which resulted in low factor loading on 3 of the items of the variable Attitude to Share Tacit Knowledge therefore these items are removed and revised questionnaire is distributed.

5) RESULTS

5.1) Descriptive

A total of 375 questionnaires are distributed with 233 responses and 23 were incomplete or unusable. 209 responses are used for the analysis. Of the I.T professional 60% respondents are Network/System Support

personals, 35% Software Developers , 4% from IT project management and 1% are I.T trainers. The average year of experience of these professionals with industry is 3 years and average experience with the organization is 2 years. 93% are male respondents and 7% female. The average age is 27 years, 45% hold a bachelors degree and 49% hold a masters degree, 5% have other qualifications. The mean value on the Intentions to share knowledge is 4.05 with a standard deviation of 0.63 indicating that most I.T professionals have the intent to share their knowledge. The mean value on Subjective Norm is 3.78 with standard deviation of 0.52 indicating moderate level of perception on knowledge sharing norms. Mean value for Attitude is 3.95 with standard deviation of 0.577 indicating again a moderate attitude towards knowledge sharing.

5.2) Measurement Model Testing

To check for consistency Cronbach Alpha is obtained using SPSS 18.0. Attitude to Share received 0.577, Subjective Norm (Normative Belief) receive 0.786. Subjective Norm (Motivation to Comply) receive 0.555 and Intention to Share Knowledge receive 0.905. Item-total correlation indicates that one item from Attitude to Share had low value, by dropping one item the Cronbach Alpha of the factor Attitude to share improves to 0.674. Ideally the acceptable values have to be 0.7 and above (Nunnally et al., 1994) in our case all the other factors show good reliability except for Subjective Norm (Motivation to Comply) which exhibits a moderate reliability. Confirmatory Factor Analysis is conducted using AMOS 16.0, convergent validity is obtained by studying the factor loading, Attitude to Share items receive values ranging from (0.573 to 0.888), Subjective Norm items ranging (Normative Belief) values ranging (0.544 to 0.921). Subjective Norm item receive (Motivation to Comply) values ranging from (0.32 to 1) and Intention to Share Knowledge items values ranging from (0.632 to 0.895) in most of the cases the loading are above 0.35 which is the recommended level (Hair et al, 1998). Modification Indices indicated error term for SN4 had a small significance variance which is dropped from the model[3]. Covariance between error terms of ISTK5, ISTK3 and ISTK1, ISTK2 was indicated; therefore the structural model was re-specified with correlations between error terms of ISTK5, ISTK3 and ISTK2, ISTK1 which resulted in the following over all model fit indices.

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[3] http:\\fb013000030.lancs.ac.uk/notes/stru_equ/session6.pdf.

Based on SEM standards/heuristics for verifying the fitness of the model we analyze the P-value. The P-value indicates the overall fitness of the model with the collected data and >0.05 value is an indication of overall fitness of data. For our research model the value is 0.218 which well within the limits. The Chi-Square, GFI, NFI, AGFI and RMR values are the indicators of construct validity and are all in the acceptable range (Gefen, 2000). To check for the path analysis we analyze the structural model.

5.3) Structural Model Testing (Path Analysis)

A path model of the research model is depicted in Figure 3: which shows the coefficient receives against each variable. The path coefficients are also separately listed in Table 1. The variable Subjective Norm (SN) has a positive direct effect (0.600) on Intention to Share Tacit Knowledge (ISTK) and is significant at .007 level which is consistent with the findings of Shepherd (1994), Seewon et al (2003). Further it also indicates that Subjective Norm(SN) has a positive effect on Attitude(Att) (0.56) and is significant at .000 level which proves the hypotheses no: 2 and no: 3 of our research. The affect of Attitude (Att) on Intention to Share Tacit Knowledge (ISTK) is (–0.062) and not significant which disproves our hypothesis no: 1.

Table 1: Strength and Significance of Individual Path

Path Coefficient (Standardized Regression Weights)		
SN→ATT	0.557	Significant at 0.000
SN→ISTK	0.600	Significant at 0.007
ATT→ISTK	-.062	Significant at 0.662

Figure 3 shows the R-Square received on the model is 0.32 indicating that the model measures 32% of variability in the intentions to share tacit knowledge.
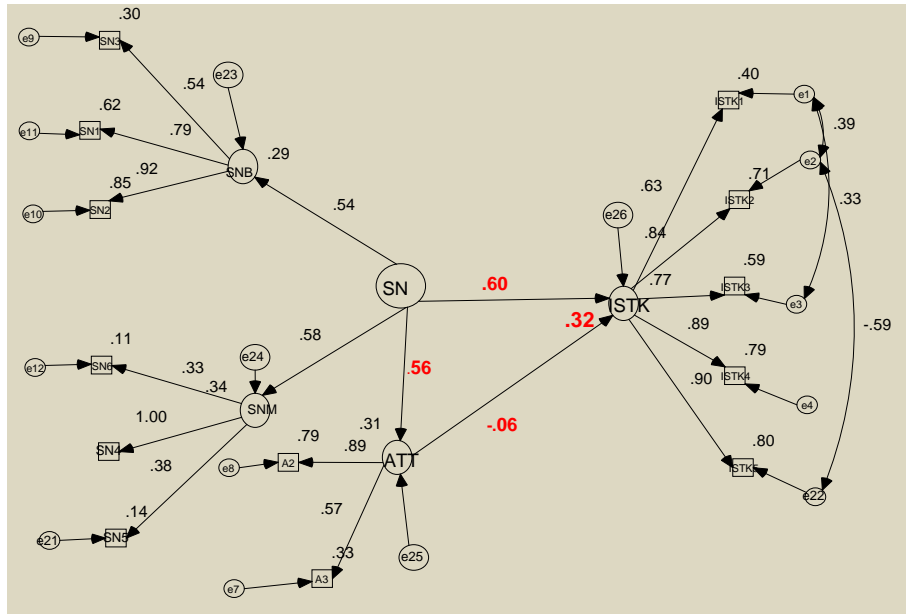
Figure 3: Research Structural Model

SN (Perceived Subjective Norm to Share Tacit Knowledge), SNB (Normative Belief to Share Tacit Knowledge), SNM (Normative Motivation to Share Tacit Knowledge) ATT (Attitude to Share Tacit Knowledge), ISTK (Intentions to Share Tacit Knowledge) e1..e28 as Error term.

6) DISCUSSION

Sharing of Tacit Knowledge is a social behavior; to understand it Theory of Reasoned Action has been applied. It theorizes that an individual who has a positive attitude towards sharing [their….?] tacit knowledge and perceive that the important others are supportive of this behavior then the individual would certainly develop positive intentions to share their tacit knowledge. The theory was applied to test the sharing of tacit knowledge behavior. The results of the study partially supported the theory. The relationship between subjective norm and intention was successfully established, so was the relationship between subjective norm and attitude, but the theory did not hold true in the case where the relationship between attitude and intentions was found to be negative and insignificant. The question is why does the Pakistani I.T professional show a good intent level to share his/her tacit knowledge? But scores low on attitude towards sharing tacit knowledge. This can be explained under the backdrop of Geert Hofstede cultural values.

According to Hofstede[4] Pakistan's national culture is identified as low on *Individualism*, high on acceptability of *Power Distance* and low on *Long Term Orientation*. These finding suggest that people in this part of the world prefer to relate with a group, are comfortable with imbalance of distribution of power, have regard for tradition, like to carrying out social responsibilities and are very conscious of protecting one's face. All of these values indicating a strong role of the cultural on its people. Any social behavior would be immensely influenced by social values and norms. Therefore while studying the sharing behavior in this society, one would find that intentions of individuals would be greatly influenced by prevalent norms and beliefs. The individual would be found to succumb to the society pressure and shy away from following their own true will and their true feeling. The society norms .have precedence over individual attitudes, that is why when the Pakistani I.T professionals were assessed on their intentions to share tacit knowledge , they showed low attitude but good intent and this can be attributed to the fact that society and the important others dominate the intention formation.

7) IMPLICATIONS

Knowledge sharing is an important activity which ensures the optimal utilization of a very important resource "Knowledge" particularly the "Tacit Knowledge". This resource enables the organizations to make quick quality decisions, produce quality product/services and encourage innovation. Since sharing knowledge is human behavior, ensuring the quality of sharing requires a deep understanding of the psychology of human behavior. The Theory of Reasoned Action provides us an insight into the intention formation. The better we understand the dimensions of tacit knowledge sharing intention the more chances we have of obtaining high quality of tacit knowledge.

The study has several implications to tacit knowledge sharing intentions among I.T professionals. First it has been demonstrated that TRA can be used successfully to explain the Intention formation towards tacit knowledge sharing. Second the research findings have highlighted the pivot role of subjective norms within the TRA model. It is deducted that local I.T professionals intentions are more influenced by the beliefs of the

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4 http:\\ geert-hofstede.com/hofstede_pakistan.shtml

important others (boss, colleagues, mentor, friends) and less by their own personal beliefs.

Third the management needs to motivate these professionals through socialization process of commitment, respect and recognition. Organizations need to develop interactions between the expert and the novice by letting them bond as mentor and apprentices.

Forth the sharing of quality tacit knowledge is a human act which needs nurturing and it cannot be forced. Hence an atmosphere of caring, interaction, trust and respect is to be provided. Fifth the local companies need to initiate implementation of Knowledge Management Systems, the real data source to these systems are the professionals and in our case, they have shown intent to share their tacit knowledge. Fifth tacit knowledge sharing can help improve existing organizational practices and fuel the innovation process.

Collectively these implications are encouraging and I.T organizations need to have a Knowledge Management strategy, provided they develop a knowledge sharing culture first.

There are some limitations of this study which can be overcome if research is carried out in the areas indicated below.

a) The researchers believe that actual knowledge sharing behavior needs to be re-studied once a sufficient number of organizations have implemented knowledge management strategies and knowledge management systems.
b) To obtain high level of predictability TPB has been adopted as it is a superior model (Seewon, 2003) to measure behavior as it caters for variable subjective control which is closely associated with behavior.
c) Although the study is limited to the survey of I.T professionals intentions to share their tacit knowledge but we can cautiously apply these findings to other similar technology based companies.

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