Understanding Knowledge Sharing Intention
From IT Service Operations and KM Infrastructure Perspectives

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Abstract

Knowledge management (KM) is an extremely important activity in the IS industry where IS/IT professionals are often involved in knowledge-intensive work. To add value and benefit the organization, knowledge of these professionals needs to be shared. The business focus of IS/IT industry is changing from technology management to service management, the concern of IT Service Operations (ITSO) is increased. In addition, KM Infrastructure (KMI) is one of key organizational capabilities lead the organization in the direction of successful KM. Consequently, it is believed that both ITSO and KMI of organization affect knowledge sharing behavior of their employees. This research explores the influence of ITSO and KMI on employees’ intention to share knowledge, and proposes a research model from this perspective. Overall, the results demonstrate a strong support of the proposed model.

Keywords: Knowledge Sharing Intention, IT Service Operations, KM Infrastructure

1. Introduction

In modern organizations, knowledge is treated as a vital and significant strategic organizational resource that can influence the competitive advantages of the organization (Alavi and Leidner, 2001). Knowledge management (KM) is considered as a key activity which is critical to the organization’s success. From an individual perspective, knowledge is defined as a justified belief that increases an entity’s capacity for effective action (Nonaka, 1994). In the organizational context, KM refers to identifying and leveraging the collective knowledge in an organization to help the organization to compete. Therefore, managing individual employee’s knowledge for increasing organization’s benefits is one of key objectives of KM. Especially, managing knowledge is an extremely important activity in the IS/IT industry where professionals are often involved in knowledge-intensive work (Rus and Lindvall, 2002). Organizations are likely to run into difficulties if the knowledge of individual employee is not well-managed. Knowledge sharing or transfer is perceived to be the most essential activity (Bock and Kim, 2002). Therefore, this research aims at two questions: (1) What organizational factors facilitate knowledge sharing among employees? (2) How these factors affect knowledge sharing behavior of employees? Since employees’ intention to share knowledge is the most vital determinant of their knowledge sharing behavior, IT Service Operations and KM Infrastructure are identified and believed to influence employees’ intention. This paper is the first attempt to investigate the impact of them on knowledge sharing intention.

2. Theoretical Development

2.1 Knowledge Sharing
It is no doubt that knowledge sharing takes an important role in maintaining sustainable competitive advantages of an organization in IS/IT industry. In recent years, it attracted researchers to study it from a variety of perspectives. Ajzen’s (1991) Theory of Planned Behavior (TPB), a widely-accepted theory in social psychology, has been applied in this research for studying knowledge sharing behavior. A pilot study by the authors revealed that TPB is a sufficient model to explain knowledge sharing intention in IS context. According to this theory, intention to perform a behavior is the direct determinant and the most important determinant of actual performance of such behavior. It is believed that the stronger intention to engage in a behavior, the more likely should be its performance. The individual employee’s intention to share knowledge can be predicted with high accuracy from the attitudes toward knowledge sharing behavior, the subjective norms regarding knowledge sharing, and the perceived behavioral control over knowledge sharing. First, attitude is an individual’s positive or negative behavioral belief about performing a specific behavior. Second, subjective norm is the individual’s perception that most people who are important to him or her think he or she should or should not perform the behavior in question. Last, perceived behavioral control refers to the degree to which an individual feels that performance or nonperformance of the behavior in question is under his or her volitional control. Applying TPB in this study, we hypothesize that:

Hypothesis 1: Attitude toward knowledge sharing is positively related with intention to share knowledge.

Hypothesis 2: Subjective norm regarding knowledge sharing is positively related with intention to share knowledge.

Hypothesis 3: Perceived behavioral control over knowledge sharing is positively related with intention to share knowledge.

Although knowledge sharing intention has been studied broadly in previous research, researchers pay little attention on the effect of two key factors: ITSO and KMI. We believed that both these factors are essential for KM in IS/IT industry, and play a critical role in affecting employees’ intention of knowledge sharing. Each of these aspects is discussed in the following sections.

2.2 Information Technology Service Operations

Many IS/IT companies realize management of technology is not adequate in the current business environment, and that their focus are shifting to service management nowadays (van Bon, 2002). In managing IT services, ITSO, which includes daily operational activities to enable and monitor on-going service provided as well as to handle customer service requests to meet agreed level of service quality, involves extensive knowledge which needs to be shared among employees. Firms reorganize their IT operations in order to be more responsive to user needs. The most critical need for IT operations success includes recruiting, training, and retaining knowledgeable people to operate, maintain, and develop IT services (Applegate et al., 1999). Therefore, knowledge sharing plays an important role in daily operations. From this perspective, a preliminary study in this area by the authors identified the need for investigation of the relationship between knowledge sharing intention and ITSO.

For service management in IT, Information Technology Infrastructure Library (ITIL) is a de facto industry standard and one of the most widely accepted approaches in the world (van Bon, 2002). ITIL contains a set of best practice advice and guidance on the provision of quality IT services, thus many global companies adopt it into their business for managing IT services. Based on ITIL, various operational activities which involve extensive knowledge
sharing among the employees belonging to ITSO were identified and classified into three categories in a previous study by the authors. They are (1) operation management; (2) incident and service request management; and (3) problem management. Consequently, we hypothesize that ITSO influences intention to share knowledge through its three direct determinants:

**Hypothesis 4:** Practice of IT Service Operations in organization is positively related with employees’ attitude toward knowledge sharing.

**Hypothesis 5:** Practice of IT Service Operations in organization is positively related with employees’ subjective norm regarding knowledge sharing.

**Hypothesis 6:** Practice of IT Service Operations in organization is positively related with employees’ perceived behavioral control over knowledge sharing.

### 2.3 Knowledge Management Infrastructure

Previous research indicates that competitive advantage increasingly requires knowledge sharing among employees in modern organizations. Gold et al. (2001) make use of the absorptive capacity theory to study organizational capability from the KM perspective. They define organizational capability is the ability of an organization to realize the value of its knowledge assets, assimilate it and apply it. Similar argument is provided by Lee and Choi (2003) in their study of knowledge enablers, they mention that knowledge infrastructure establishes enabling conditions for achieving organizational performance through facilitation of knowledge sharing processes. However, the effect of knowledge management infrastructure (KMI) on the knowledge sharing behavior of individual employee within the organization has not been investigated. Even though the importance of individual knowledge towards organization’s competitive advantage is addressed in Grant’s knowledge-based theory (Grant, 1996), researchers pay little attention on it in the studies of KMI. The KMI of an organization is believed to be an important factor influencing knowledge sharing intention of its employees. Prior studies considered KMI as a multi-dimensional construct (Blackler et al., 1998; Gold et al., 2001), therefore, technological, structural and cultural dimensions of KMI are studied in this research.

#### 2.3.1 Technological Infrastructure

Technological dimension of KM infrastructure refers to the existing technology-enabled binding within the organization, and it determines how knowledge is accessed and how knowledge flows throughout the enterprise (Gold et al., 2001). In their in-depth study of organizational IT infrastructure capability, Lewis and Byrd (2003) attach the importance of IT to implementation of KM initiatives. IT is used as a means to support KM (Lee and Choi, 2003), and to integrate fragmented information and knowledge flow in an organization (Gold et al., 2001). Technological infrastructure facilitates sharing of knowledge by offering the conditions that enable knowledge to be readily accessible, quickly distributable, and easily retrievable.

#### 2.3.2 Structural Infrastructure

Structural dimension of KM infrastructure refers to the presence of norms and trust mechanisms, and it comprises an organization’s formal organizational structure and incentive systems (Gold et al., 2001). Previous research reveals that knowledge sharing and collaboration is more likely to be encouraged in the organization with more flexible, less formalized and centralized structure. Reward and incentive systems motivate, compensate, and recognize the workers for taking time and effort to contribute their knowledge and expertise. Arguments exist with regard to the effect of such systems on knowledge sharing behavior (Davenport and Probs, 2002). Therefore, it is suggested that a reward and
incentive system should be in form of both material (monetary gratification and compensation) and immaterial (career prospects, involvement in decision making and recognized contributions), to motivate employees extrinsically and intrinsically.

2.3.3 Cultural Infrastructure
Cultural dimension of KM infrastructure refers to the shared contexts that is developed within the firm, and it should be established and communicated effectively across the whole firm for encouraging successful KM process (Gold et al., 2001). An appropriate culture should be created to encourage both formal and informal interaction between employees, so that their opinions, associations, relationships and knowledge are shared across boundaries of and within the organization. Such collaborative culture aids development of shared understanding, and promotes knowledge exchange by reducing fear and risk of workers. In addition, employees are more willing to participate and more active in knowledge sharing when their relationship is high in trust (Lee and Choi, 2003) and learning is promoted (Andrews and Delahaye, 2000).

Regarding KM Infrastructure, we hypothesize that it influences the intention to share knowledge through its three direct determinants:

Hypothesis 7: Establishment of KM Infrastructure in organization is positively related with employees’ attitude toward knowledge sharing.

Hypothesis 8: Establishment of KM Infrastructure in organization is positively related with employees’ subjective norm regarding knowledge sharing.

Hypothesis 9: Establishment of KM Infrastructure in organization is positively related with employees’ perceived behavioral control over knowledge sharing.

3. Research Method
The survey research method was used to collect data for testing the proposed model. The questionnaire employed in this study had been used in prior studies. The scales developed by Ajzen (2002), Gold et al. (2001) and the authors were used for measuring Knowledge Sharing Intention, KM Infrastructure and IT Service Operations constructs respectively using a seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree) in the survey. The questionnaire was administered to 50 working IS/IT professionals attending a part-time postgraduate degree program in an university. A total of 42 completed questionnaires were returned for a response rate of 84%. Among the respondents, about 69% were male and 31% were female. The average working experiences was 6.9 years (S.D. = 3.3). The respondents are mainly working in Computer & Technology / Internet industry (21.4%) and Banking & Finance industry (21.4%). A total of 28.6% of respondents are analyst programmers, and 14.3% are system analysts. The main job duties of the respondents included development (40.3%), and technical support (18.2%).

4. Analysis
The survey data were analyzed using Partial Least Squares (PLS) which is a structural equation modeling technique that accesses the measurement model (relationships between questions and constructs) within the context of the structural model (relationships among constructs).

4.1 Measurement Model
Three tests were used to assess convergent validity: (1) reliability of questions, (2) composite reliability of constructs, and (3) average variance extracted (AVE) by constructs (Fornell and Larcker, 1981). Reliability of the questions was assessed by examining the loadings of each
question and it was found to be adequate because all the loadings are above 0.7 (Nunnally, 1994) except two (0.698; 0.690); however, they still pass the minimum level of 0.5. When examining the composite reliability of constructs, a score of 0.8 as an indication of adequate composite reliability (Nunnally, 1994). Cronbach’s Alpha is an additional assessment of reliability, all Alpha values above the recommended 0.7 level. It was suggested that the constructs should have an AVE of at least 0.5 for demonstrating an adequate level (Fornell and Larcker, 1981). Table 1 provides a summary of statistical results. Discriminant validity was assessed by looking at correlations among constructs and variances of and covariances among constructs. For this, each question should correlate more highly with other questions measuring the same construct than with other questions measuring other constructs. This can be examined by determining whether the average variance shared between a construct and it measures exceeded the variance shared between the construct and other constructs in the model. Good discriminant validity was demonstrated because all the diagonal elements in Table 2 were greater than corresponding off-diagonal elements, and the correlation between all pairs of ITSO dimensions and KMI dimensions is below the suggested cutoff of 0.90 level (Fornell and Larcker, 1981).

Since the second order constructs (ITSO and KMI) were formed by the first order constructs (the underlying dimensions), the path weights were examined for assessment of relative importance of dimensions. All paths were significant at the 0.01 level. The most important dimension in formation of ITSO construct was problem management (path weight = 0.473) followed by incident and service request management (path weight = 0.355) and operation management (path weight = 0.336). In formation of KMI, the most important dimension was structural infrastructure (path weight = 0.439) followed by cultural infrastructure (path weight = 0.397) and technological infrastructure (path weight = 0.293).

<table>
<thead>
<tr>
<th>Construct</th>
<th>Composite Reliability</th>
<th>Cronbach’s Alpha</th>
<th>Average Variance Extracted</th>
<th>Construct</th>
<th>Composite Reliability</th>
<th>Cronbach’s Alpha</th>
<th>Average Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>OM</td>
<td>0.882</td>
<td>0.867</td>
<td>0.601</td>
<td>TI</td>
<td>0.928</td>
<td>0.898</td>
<td>0.723</td>
</tr>
<tr>
<td>ISRM</td>
<td>0.914</td>
<td>0.909</td>
<td>0.680</td>
<td>ATT</td>
<td>0.948</td>
<td>0.926</td>
<td>0.820</td>
</tr>
<tr>
<td>PM</td>
<td>0.924</td>
<td>0.911</td>
<td>0.709</td>
<td>SN</td>
<td>0.925</td>
<td>0.859</td>
<td>0.754</td>
</tr>
<tr>
<td>SI</td>
<td>0.916</td>
<td>0.886</td>
<td>0.686</td>
<td>PBC</td>
<td>0.891</td>
<td>0.781</td>
<td>0.673</td>
</tr>
<tr>
<td>CI</td>
<td>0.890</td>
<td>0.854</td>
<td>0.619</td>
<td>INT</td>
<td>0.916</td>
<td>0.835</td>
<td>0.785</td>
</tr>
</tbody>
</table>

| OM | 0.775 |
| ISRM | 0.623  | 0.825 |
| PM | 0.592  | 0.595  | 0.842 |
| SI | 0.190  | 0.222  | 0.382  | 0.828 |
| CI | 0.170  | 0.180  | 0.458  | 0.707  | 0.787 |
| TI | 0.234  | 0.254  | 0.159  | 0.572  | 0.591  | 0.850 |
| ATT | 0.237  | 0.227  | 0.498  | 0.410  | 0.462  | 0.086  | 0.906 |
| SN | 0.331  | 0.381  | 0.371  | 0.483  | 0.635  | 0.358  | 0.556  | 0.868 |
| PBC | 0.409  | 0.259  | 0.515  | 0.458  | 0.382  | 0.177  | 0.684  | 0.336  | 0.820 |
| INT | 0.207  | 0.104  | 0.441  | 0.487  | 0.428  | 0.088  | 0.742  | 0.350  | 0.758  | 0.886 |

Note: The diagonal elements are the square roots of the average variance extracted (AVE); the off-diagonal elements are the inter-construct correlations.

### 4.2 Structural Model
With adequate measurement model, the hypotheses were tested by examining the structural model. The test of the structural model includes estimating the path coefficients (the strengths of the relationship between the dependent and independent variables) and the $R^2$ value (the amount of variance explained by independent variables). A significance level of 0.05 was adopted. All path coefficients, except one, were significant, providing strong support for the research model (Figure 1). The structural model explains 23.7%, 39.1% and 30% of the variance for attitude, subjective norm and perceived behavioral control respectively; and 67.1% of the variance for intention to share knowledge. All hypotheses were supported except Hypothesis 2.

**5. Discussion and Implications**
Overall, the results from this study indicate that the proposed model is an adequate model for investigating behavioral intention of knowledge sharing from the perspectives of ITSO and KMI. It can be observed from the $R^2$ values that the model explains the knowledge sharing intention and its determinants. All hypotheses, except the Hypothesis 2, were significant. This could be due to the characteristics of the sample which included fairly experienced respondents (over 6.9 years of experience) on whom the influence of subjective norm towards intention to knowledge sharing may be minimal.

This study presents significant theoretical contributions as well as practical contributions. Theoretically, it adds to the existing body of KM literature by identifying the key organization factors influencing knowledge sharing behavior, and exploring the relationships between them. This study attempts to take ITSO and KMI perspectives to explore knowledge sharing behavior of employees, and the result suggests that both are significant factors to facilitate and enable knowledge sharing. This study also has implications for practice in knowledge sharing promotion within the organization. Since ITSO and KMI significantly affect all direct determinant of knowledge sharing intention, knowledge sharing could be promoted through establishing ITSO practices and KM infrastructures. The
identified dimensions provide a foundation for establishment of ITSO and KMI, therefore top management could start their promotion of knowledge sharing at these dimensions. Although a strong support of the research model is demonstrated in this study, there are certain shortcomings that need to be addressed. The relatively small sample size has limited statistical power of the implications drawn. In addition, the use of self-report scales to measure the study variables may involve the possibility of common method bias for some results obtained. Research opportunities exist for studying the effect of other components of ITSM on knowledge sharing in addition to ITSO. Moreover, future research extending this study from intention to actual performance of knowledge sharing behavior would also be interesting.

References


