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The Relationship Between Knowledge Characteristics And Knowledge Value

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ABSTRACT

This paper seeks to define the relationship between knowledge characteristics and their perceived value. The research model proposes that the knowledge characteristics influence the perceived value of knowledge. The survey was conducted in eight large organizations in Thailand. The proposed hypotheses were examined by applying Structural Equation Model. The research reveals two knowledge characteristics that negatively affect perceived value of knowledge due to transfer difficulty. In addition, one knowledge characteristic is found to positively influence value perception of knowledge due to difficulty to imitate, which in turn leads to competitive advantage. The study contributes to richer understanding of the most crucial factor in knowledge transfer, that is, knowledge itself. This should be of interest to management responsible for organizational knowledge exchange agenda.

Key words- Knowledge characteristic, Value of knowledge, Knowledge transfer

Paper type- Research paper

1. INTRODUCTION

Today most buyers are cautious, wanting value for their money when buying products or services. Characteristics of products and services always lead to their perceived value. All product and service innovation must answer the question what are the characteristics on which customers will place value. Marketers also try to communicate these characteristics to customers. Knowledge is a kind of credence product that needs high involvement because its value is difficult to recognize until it is acquired and used (Desouza et al., 2006).

Value of innovation can be derived from the performance expectancy that using the innovation will help improve job performance. The innovation value can be derived from social influence, the perception that others considered important believe that one should use this innovation (Venkatesh et al., 2003). Regarding stream of research in knowledge management, researchers have pursued what is perceived as knowledge value (Bock et al., 2005; Ford & Staples, 2006; Kankanhalli et al., 2005; Wasko & Faraj, 2005). Value of knowledge can be derived from its usefulness and the privilege it confers (Desouza, et al., 2006; Ford & Staples, 2006). People not only acquire knowledge because of wanting to know or use it, but they also acquire knowledge because they expect to be recognized as an expert in a knowledge domain, especially one to which their social context gives value (Brown & Duguid, 2001). Usefulness of knowledge can derive from the advantage gained from using knowledge for task accomplishment. It also derives from compatibility of knowledge with the task for which it is to be used. Privilege results from looking good, gaining job status, or reputation when being an expert in the knowledge domain.

Innovation acceptance and usage can be influenced by effort expectancy to use it (Davis, et al., 1989; Moore & Benbasat, 1991; Venkatesh et al., 2003). Likewise, knowledge characteristics are classified based on attributes that cause difficulty in the transfer process i.e. stickiness of knowledge (Leonard, 2007; Simonin, 1999; Szulanski, 1996). There are four sticky knowledge characteristics that have been researched by scholars for their transfer difficulties. The first characteristic is ambiguity between cause and effect that leads to success or failure from using it. The second one is specificity for particular use or particular users that renders the knowledge inappropriate for other situations or other users. Since knowledge contains both explicit and tacit components, the tacit component can cause difficulty in transfer because it cannot be codified and communicated by language. Finally, complicated knowledge that contains many interrelated components is hard to transfer (Leonard, c2007; Powell et al., 2006; Riusala & Smale, 2007; Simonin, 1999; Szulanski, 1996; Szulanski et al., 2004).

Despite the growing interest in knowledge characteristics and the value dimensions of knowledge, our review of available literature has found no study that addresses what knowledge characteristics lead to its perceived value. Therefore, the main research question of this study is what are the relationships between knowledge characteristics and value perceived.

2. THEORETICAL BACKGROUND

The first perceived value of knowledge representing performance expectancy from using knowledge is Perceived Relative Advantage (Venkatesh et al., 2003). The relative advantage construct is derived from Innovation Diffusion Theory (IDT) where the construct refers to "the degree to which an innovation is perceived as being better than its precursor" (Moore & Benbasat, 1991, p.195). The other construct that pertains to performance expectancy is Perceived Usefulness using the Technology Acceptance Model (TAM/TAM2) (Davis, et al., 1989; Venkatesh & Davis, 2000). The Perceived Usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). Scholars have acknowledged the similarity of the two constructs (Davis et al., 1989; Moore & Benbasat, 1991; Karahanna et al., 1999; Venkatesh et al., 2003). Knowledge will be perceived as having value when new knowledge is better than previous knowledge or lack of knowledge. New knowledge is better when it can provide recipients with new insight or skill to

accomplish a task more effectively and efficiently (Desouza, et al., 2006; Ford & Staples, 2006). Expecting this value from using the acquired knowledge, a recipient needs to clearly understand what are the factors and how they interact to produce a production capability and intended performance (Szulanski, 1996; Szulanski, et al., 2004). A recipient should also recognize the rational link between actions and outcomes, inputs and outputs, and causes and effects from applying knowledge (Simonin, 1999). In addition, the reason for the success and failure of a practice should be acknowledged (Leonard, c2007). Researchers use the term Causal Ambiguity of Knowledge to describe the knowledge characteristic that lacks the clear understanding and certainty of the previously mentioned knowledge characteristics. The more causal ambiguity of knowledge, the more uncertainty of the expectation that knowledge will help a recipient to accomplish a task more effectively and efficiently. This lead to the first hypothesis;

H1: Perceived Causal Ambiguity of Knowledge is negatively related to its Perceived Relative Advantage.

The second value of knowledge derives from its compatibility with the situation in which it is to be used and the users who use it. Knowledge compatibility can be in terms of complying with presented need, past experience, presented work practices, and preferred work style (Karahanna et al., 2006; Karahanna et al., 1999; Moore & Benbasat, 1991; Taylor & Todd, 1995; Venkatesh et al., 2003). For knowledge to be valued, it has to be used in a specific place at a specific time (Nonaka & Konno, 1998). This is possible only when users can interpret the knowledge within the context to be used (Chou & He, 2004). Some knowledge is rigidly codified for particular use and particular users, which causes difficulty in adaptation and use by others (Leonard, c2007). Knowledge may be created specifically for use in conjunction with specific resources (McEvily & Chakravarthy, 2002). Knowledge may be appropriate for a particular culture, nation, ethnic, or job profession in which knowledge is previously used (Leonard, c2007). Some knowledge is context rich but when applied to other context will be ineffective or inappropriate. The loss of value when applying knowledge to other context is called the Specificity of Knowledge (Leonard, c2007; McEvily & Chakravarthy, 2002; Simonin, 1999). The greater the Specificity of Knowledge the less the chance of knowledge being compatible for use in other context. This leads to the second hypothesis;

H2: Perceived Specificity of Knowledge is negatively related to its Perceived Compatibility.

Knowledge value can be derived from social influence in which its perceived value depends on how the knowledge is accounted for in the social system. Acquired knowledge can create a recipient's sense of identity (Dixon, 2002). The more an organization places value on certain knowledge, the greater the image gain from knowing or using it (Ford & Staples, 2006; Venkatesh et al., 2003). Image is defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p.195). Regarding knowledge as one form of innovation, the Perceived Image Gain can derive from the improvement in one's social status, sense of pride and job security based on knowing or using knowledge. In the work place where an individual has to compete with others, image can be enhanced by a person's competitive advantage. Tacitness and complexity of knowledge can, on the negative side, cause transfer difficulties but on the positive side they can be sources of competitive advantage for those who know or use the knowledge because it is difficult for others to imitate (Kang, 2007; McEvily & Chakravarthy, 2002). Tacitness of Knowledge is the characteristic in which knowledge contains personal know-how, skill that is hard to capture, or a knowledge source's mental model (Nonaka & Konno, 1998). Complexity of Knowledge is a degree of knowledge difficulty that needs much effort to comprehend or use (McEvily & Chakravarthy, 2002). Complicated knowledge usually contains many unique interrelated components that are equally important on the outcomes of using the knowledge (McEvily & Chakravarthy, 2002; Simonin, 1999).

Knowledge that can be codified and entered into knowledge repositories or expert systems will minimize the value of those who know or use it. Potentially this could render one redundant or easily replaced. Therefore, personal competitive advantage can be sustained when one obtains tacit knowledge that is hard

for others to imitate (Jelavic, 2011).As a result, knowledge with a high degree of tacitness should enhance job security for those who know and use it. This leads to the following hypothesis;

H3: Perceived Tacitness of Knowledge is positively related to Perceived Image Gain.

Marketing literature introduces the concept called metacognitive experience to represent the process by which consumers analyze information pertaining to product features in order to evaluate the product (Schwarz 2004). For a product where uniqueness signals higher value, metacognitive difficulty makes the product value appear to be satisfied because consumers associate their effort in processing information with the success of fulfilling their goal (Labroo & Kim 2009; Popcheptsova et al., 2010). To improve one's social status and sense of pride from knowing or using knowledge, the knowledge should make a recipient unique and difficult for others to imitate. Knowledge that needs much effort to comprehend will appear to fulfill the uniqueness goal, which leads to the following hypothesis;

H4: Perceived Complexity of Knowledge is positively related to Perceived Image Gain.

IS literature proposes causal linkage between Perceived Relative Advantage and Perceived Compatibility of knowledge (Karahanna, et al., 2006; Moore & Benbasat, 1991). If knowledge is compatible with the context in which it is to be used, then there should be a high chance of effective and efficient task accomplishment by using it. This results in the fifth hypothesis;

H5: Perceived Compatibility of Knowledge is positively related to Perceived Relative Advantage.

The improvement of one's social status will enhance one's power to influence others. This will lead to increasing one's effective and efficient task accomplishment (Venkatesh & Davis, 2000). An individual may thus perceive that knowledge that causes improvement in his or her social status will lead to better job performance. This leads to the last hypothesis;

H6: Perceived Image Gain is positively related to Perceived Relative Advantage.

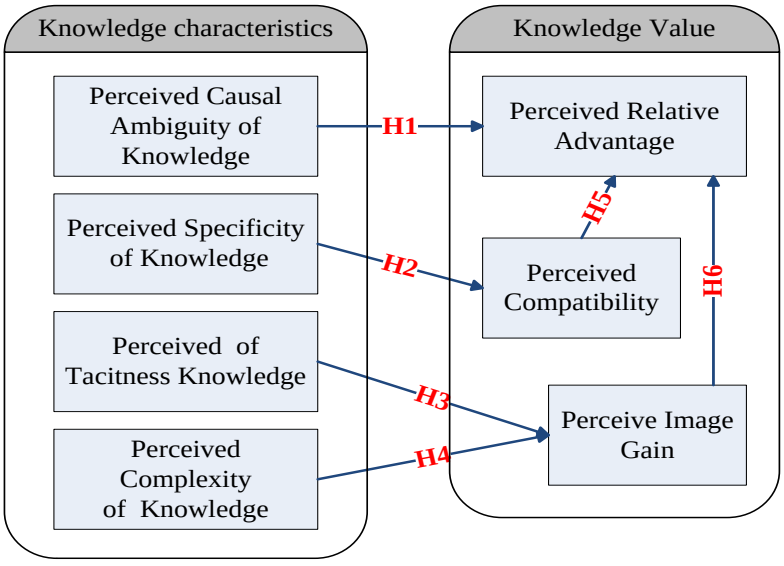

Figure 1 Research Model

3. RESEARCH METHODOLOGY AND ANALYSIS

To test the proposed research model, this study adopted survey method for data collection, and examined hypotheses by applying Structural Equation Model Method to the collected data. The unit of analysis was an individual.

3.1 Questionnaire Design

Where available, the measured items that had been validated by other studies were adapted and altered to fit the study context. The instruction asked respondents to think about and to write down the salient event in which they turn to others for their internal work related knowledge including the knowledge they learned and the source from which they learned it (Levin & Cross, 2004). Because "knowledge" can be an ambiguous term, the respondents were asked to think of knowledge, opinions, points of view, or experience (Gray & Meister, 2004). A pretest was conducted by adopting behavioral coding and cognitive interview techniques with a small group of respondents. Items encountering problems were revised to ensure that the questionnaire would function as intended (Czaja & Blair, 2005). The revised instrument was then pilot tested with 73 knowledge workers in various organizations in Thailand. Based on the feedback received, the survey instrument was refined.

3.2 Sample and Data Collection

The survey was conducted in four large public and four private organizations in Thailand over a period of six months, from October 2009 to March 2010. A senior executive from each organization helped to identify and distribute the survey to respondents who relied heavily on knowledge to accomplish their work (Levin & Cross, 2004). Among the 1111 surveys distributed, 732 responses were obtained yielding a response rate of 66%. Out of 732 responses, 184 responses that did not specify knowledge or the knowledge source and the responses with halo effect response bias, checked by reverse questions, were eliminated from further analysis. This resulted in 548 valid responses, of which approximately 60% of the respondents were female. The average age of the respondents was 38 years, with mean organizational tenure of 11 years and mean position tenure of four years. Their working positions ranged from top executives to staff in various functional areas. Response rate of the study was as high as 66% and T-tests on early and late responders for all variables showed no significant differences, so nonresponse bias was not a threat to the study findings. Harman's single factor test demonstrated that common method variance was not a threat to the study by (1) the result identified six factors with Eigen values more than 1 which explained 65 percent of the variance; (2) the first factor did not account for the majority of the variance among the measured items (31 percent); and (3) the unrotated factor structure did not unveil a general single factor (Karahanna, et al., 2006).

3.3 Analysis

Structural equation modeling (SEM) was used to assess the psychometric properties of the scales and to test the research model and hypotheses concurrently (Hair et al., c2006). AMOS was used as the analytic tool for SEM. The latent constructs defined in SEM can be stated as true latent constructs, hypothetically existing entities (Marcoulides et al., 2009).

As listed in Table 1, all of the measurement model fit indices matched the benchmark fit indices demonstrating goodness-of-fit for the research model (Hair, Black, Babin, Anderson, & Tatham, c2006). The validity of the structural model was also confirmed with acceptable fit indices, and the structural model fit indices were not substantially worse than the measurement model (Hair et al., c2006).

	Number of observations	Number of observed variables	Number of estimated parameters	Degrees of freedom	X^2 p-value	X^2	CFI	TLI	RMSEA
Model fit criteria	> 250 and < 1000	>12, <30	NA	NA	Significant *p*-values	NA	≥ .92	≥ .92	≤ .07 with CFI > .92
Measurement model	548	26	99	278	*p*-values = .000	*692.8*	.94	.93	.05
Structural model	548	26	90	287	*p*-values = .000	*812.2*	.92	.91	.06

Table 1 Model Fit Indices

Convergent validity of the constructs was accessed by three criteria. First, standardized factors with loading of more than 0.5, ideally more than 0.7 were considered as significant. Second, reliability of the constructs was acceptable when construct reliability (CR) were more than 0.7 for each given block of items. Third, the amount of variance extracted (VE) were more than 0.5 to indicate that the majority of the variance was accounted for by the construct not a measurement error. In order to achieve those convergent and discriminant validity criteria, some predefined items with factor loading less than 0.7 were dropped. Ensuring adequate discriminant validity also demonstrated by VE estimates for two constructs were more than the square of the correlation between the two constructs (Hair et al., c2006). All the results are shown in table 2.

Constructs	Items	Item loadings in CFA	CR	VE	Square of the correlation between the two constructs						
					PRAK	PCPK	PIGK	CAK	PCK	PSK	PTK
Perceived Relative Advantage of Knowledge (PRAK)	5	0.76 0.78 0.77 0.76 0.76	0.88	0.59	0.77						
Perceived Compatibility of Knowledge (PCPK)	4	0.67 0.81 0.74 0.74	0.83	0.55	0.60	0.74					
Perceived Image Gain of Knowledge (PIGK)	5	0.75 0.79 0.67 0.85 0.81	0.88	0.60	0.14	0.10	0.78				
Perceived Causal Ambiguity of Knowledge (CAK)	3	0.65 0.76 0.71	0.75	0.50	0.12	0.09	0.14	0.71			
Perceived Complexity of Knowledge (PCK)	3	0.66 0.72 0.66	0.72	0.46	0.02	0.03	0.01	0.01	0.68		
Perceived Specificity of Knowledge (PSK)	3	0.58 0.93 0.91	0.86	0.68	0.03	0.03	0.01	0.14	0.14	0.82	
Perceived Tarcitness of Knowledge (PTK)	3	0.52 0.74 0.83	0.74	0.50	0.02	0.01	0.06	0.20	0.22	0.07	0.71

Table 2 Convergent Validity and Discriminant Validity of the Constructs

**The shaded numbers in the diagonal role are square roots of the variance extracted*

4 RESULTS

4.1 Hypotheses Tests

To support the proposed theory, the path estimates corresponding to the specified hypotheses were examined. Theory validity was verified by the extent that estimated parameters were statistically significant and in the predicted direction (Hair et al., c2006). The estimated parameters for the structural relationships representing the results of the 1st to 6th hypothesis testing are shown by figure 2.

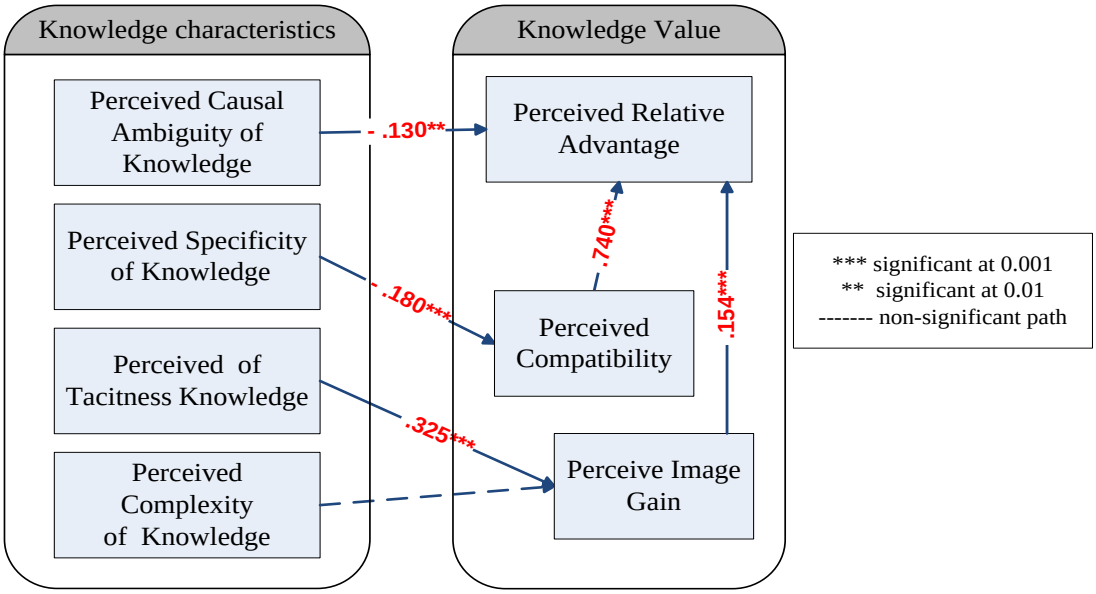

Figure 2 Results of Patch Estimate for the Hypotheses

5 DISCUSSION

A unique feature of our study is the examination of the influence of four knowledge characteristics on three knowledge value perspectives. The four original proposed knowledge characteristics can be divided into two groups. The first group emphasizes the negative consequence from transfer difficulties. The other group is viewed from the positive side regarding difficulty to imitate, which in turn leads to competitive advantage. These two distinct groups of factors both have an affect on perceived knowledge value, the first group negatively and the second positively. Causal Ambiguity negatively influences a recipient's value perception in terms of advantage from using knowledge i.e. Perceived Relative Advantage. The result complies with previous research in which validity of knowledge source contribution is limited when crucial factors and their interrelation that leads to performance of using knowledge cannot be determined i.e. the degree of Causal Ambiguity. This is usually associated with a wider gap between advocate description and the actual performance of using knowledge (Szulanski, et al., 2004). The Specificity of Knowledge causes negative value perception regarding the appropriateness of using knowledge in other contexts i.e. Perceived Compatibility. The Specificity of Knowledge causes knowledge to lose its value in redeploying for alternative use or by other users (Leonard, c2007; Simonin, 1999). Our finding illustrates that Tacitness of Knowledge infers knowledge value in terms of Perceived Image Gain. Knowledge with high tacitness, though difficult to acquire, is worthwhile as it makes one unique and difficult for others to imitate. Thus, those who know and use it will have competitive

advantage over others, which in turn enhances their social status, sense of pride and job security. Regarding value of knowledge, the more chance to use the acquired knowledge in various contexts i.e. Perceived Compatibility, the more knowledge can be helpful to accomplish work i.e. Perceived Relative Advantage. Finally, knowledge which causes improvement of one's social status i.e. Perceived Image Gain, will enhance job performance due to increasing one's power of influence.

The limitation of this study is due to data being collected from organizations that were willing to participate in the study and not randomly selected, therefore the possibility that the samples are atypical of a more general population exists. The study has an implication for an organization that does not let knowledge exchange be a personal agenda but intends to enhance it. Revealing the influence of knowledge characteristics on perceived value of knowledge, this study sheds light on the basic fundamental factor that is involved in every knowledge exchange, which is perception of knowledge. Management should not overlook this factor when intending to launch new knowledge throughout an organization.

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