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A Cognitive Process of Knowledge Sharing under the Environment of Knowledge Management Systems

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ABSTRACT

Scholars have studied the critical factors that affect the intentions behind knowledge sharing. However, an individual who is satisfied with those factors doesn't necessarily do so. When he/she considers whether to share or not, he/she usually calculates the losses and gains based on the level of perceived value of knowledge. With inclusion of the perceived value of knowledge, it has been found that there are both positive and negative relations between the perceived value of knowledge and the intention to share the knowledge. In order to resolve these contrary relations, this study proposes a cost-benefit knowledge sharing model that enables the analysis of individuals' cognitive process. We hypothesize that the contrary relations are due to the characteristics of two distinct types of knowledge: intellectual property and non-property.

Keywords (Required)

Perceived value of knowledge (PVK), knowledge sharing, cost-benefit analysis, cognitive process of knowledge sharing.

INTRODUCTION

Organizations achieve successful knowledge management systems by knowledge sharing. The main questions that drive this process are the following: first, "how eagerly do individuals put their knowledge on the system?", and second, "how valuable is the knowledge?" Some scholars have claimed that knowledge-holders are not willing to share their knowledge if they think their knowledge is valuable (Ford et al. 2005; Gupta et al. 2000a; Kalman et al. 2002). In practice, however, valuable knowledge doesn't seem to entail knowledge hoarding. Argote et al. (2003) state that social isolates with special expertise are likely to share their precious knowledge. Ford and Staples (2005) find that the perceived value of knowledge (PVK) is positively associated with the intention to share knowledge.

This study proposes a cost-benefit knowledge sharing model. The assumption underlying this model is the following: the value of knowledge is unknown until an individual shares his knowledge. This model is divided into two steps: knowledge acquiring step and knowledge sharing step. In the former, the PVK is affected by knowledge acquisition cost. In the latter, the intention to share is affected by the sharing cost and sharing benefit depending on the level of PVK.

We hypothesize that the contrary relations are due to the characteristics of two distinct types of knowledge: intellectual property and non-property. In our research, we examine how these two types of knowledge can be differently applied to the model. Further, we also explore if these two types of knowledge can provide explanations when the PVK positively affects the intention to share and when the PVK negatively affects the intention to share.

This paper is organized as follows: first, we discuss the PVK and intention to share knowledge. This is followed by a brief discussion of types of knowledge. A conceptual model of cognitive cost-benefit knowledge sharing process is elaborately proposed and described. After the development of conceptual model, a plausible result is discussed.

PERCEIVED VALUE OF KNOWLEDGE (PVK)

It is very difficult to objectively value knowledge. Nevertheless, knowledge sharing intention is presumed to be associated with value of knowledge. In addition, intention designates prior propensity and thus cannot be valued by others. Perceived Value of Knowledge (PVK) refers to the degree to which a knowledge-holder perceives his knowledge as being valuable.

PVK is a dominant factor that determines the degree to which the knowledge-holder intends to share his knowledge (Ford 2004). Leidner (2003) contends that individuals will consider the value of knowledge to themselves when they decide whether or not they will share it. Ford and Staples (2005) define PVK along with its dimensions using qualitative method, and quantitatively test its association with propensity to share. They find that the overarching dimensions of PVK are benefits, usefulness, uniqueness, and source (acquisition cost), and PVK is significantly related to knowledge-holders' intention to share their knowledge.

In this study, a modified PVK scale comprising use benefit, usefulness, uniqueness, Perceived Quality of Knowledge (PQK), and demand dimension is proposed as in Figure 1.

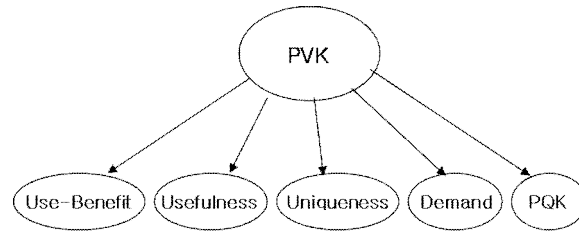


Figure 1. Perceived Value of Knowledge

This scale is useful as it provides a clear visual representation of the factors that drives the intention to share knowledge. Further, it also addresses the peculiarities of knowledge differentiated from non-knowledge such as products.

Use benefit dimension

Researchers have found that people consider benefits as the most important factor in determining the value of knowledge (Ford et al. 2005). From the transitional point of view, however, benefits can be divided into “from owning” and “from sharing”. The former is defined as use benefit, which means that knowledge-holders benefit from using the knowledge. The latter is defined as sharing benefit, which means that the knowledge-sharers benefits from sharing the knowledge. The dimension of use benefit includes competitive advantage, peace of mind. Additionally, appreciation is one of dimensions of PVK (Ford 2004). The differences of use benefit and sharing benefit will be discussed later in the section on sharing benefit.

Usefulness dimension

Usefulness is a dimension of PVK. Usefulness is frequently discussed in several studies in terms of “knowledge usefulness”. This implies that we can determine whether certain kind of knowledge is useful or not. This cognitive process is conducted by “valuing”. Levin (2004) mentions that the usefulness of knowledge is determined by the knowledge-seeker. Liao et al. (2004) explain the hierarchy of data, information, and knowledge in terms of usefulness. Gosain et al. (1997) state that scholars value usefulness as an important criteria for evaluating knowledge. Ford (2004) finds that usefulness of the knowledge is the most valued dimension of PVK by interview.

Uniqueness and demand dimensions

Knowledge is unique when only some people have a certain kind of knowledge. To the extent that others don’t have the knowledge that a few have, that knowledge is more unique to the knowledge-holder (Ford 2004). Uniqueness can be replaced by scarcity that is used in our everyday life along with value. The scarcer something is, the more value it has. While scarcity values of certain kinds of products such as antiques, rare stamps, art works, etc. are represented by their price, the scarcity values of what cannot be sold such as intangible cultural assets are identified and respected. Scarce knowledge is similar to scarce products in that costs have relatively less affect the scarcity values compared to demand. As if scarcity shows value, the degree of uniqueness of a piece of knowledge indicates how valuable the knowledge is. Further, perceptive uniqueness of one’s knowledge indicates the perceived value of the knowledge.

The determinant relation of uniqueness to the value has been widely studied. Gupta and Govindarajan (2000b) argue that uniqueness is the basis of the value of knowledge. Pearce (2001) states that the more unique the information is, the more valuable it is, and that the existence of substitutes is a critical factor affecting the economic value of the information. Cialdini (2000) argues that the availability of knowledge can reduce its valuation through a series of perceptual processes. Ford and Staples (2005) propose uniqueness as one of the dimensions of PVK.

It is also important that the perception of the extent of the demand of a piece of knowledge might determine the perception of its value. As mentioned above, the value of a product can be presented by price, and price is determined by demand if other conditions are controlled. In the case of a non-product, however, value is determined by demand because price is not accounted for. That is, the more people want one’s knowledge, the more valuable the knowledge is. Further, perceived demand for one’s knowledge modulates the perceived value of the knowledge.

Perceived quality of knowledge (PQK) dimensions

Perceived quality of knowledge (PQK) dimension is also accounted for as a dimension of PVK. Toften et al. (2004) states that the perceived quality of information is an indicator of perceived value of information. Behrendt et al. (2003) postulates that the quality of knowledge assets may depend on its timeliness, accuracy, reliability, presentation, completeness, its importance to solve a particular problem, and its relevance or format from the customer's perspective.

INTELLECTUAL PROPERTY AND NON-PROPERTY KNOWLEDGE

Intellectual property is denoted as an intangible asset that consists of human knowledge and ideas. It is usually protected by law such as patents, copyrights, trademarks, design, etc.. From intellectual properties, knowledge-holders are able to derive economic benefits. When there is no economic benefit from sharing intellectual properties, such knowledge is substantial to the organization while being useless to knowledge-holders. Rather, sharing intellectual properties within organization sometimes gets the knowledge-holders extraneous benefits such as reward and being respected by co-workers. Members in an organization are likely to share their intellectual properties no matter who will eventually have rights for the knowledge only if they get benefits based on the PVK.

Non-property knowledge refers to the knowledge that cannot be converted to property. This means that the knowledge-holders cannot derive economic benefits. However, sharing the non-property knowledge might result in losing power; furthermore, in the worst possible instance, the knowledge-holders might be useless to the organization. Members in an organization are not likely to share their non-property knowledge, but are likely to hoard it, so as not to lose power.

DEVELOPMENT OF THE COST-BENEFIT KNOWLEDGE SHARING MODEL

Once an individual acquires knowledge, he possibly values the knowledge based on perceptions of how beneficial it is to his status and financial profit and its uniqueness, its demand, and its quality. At this point, a person can ask to share the knowledge (if people know who has the knowledge). Sharing incentives can motivate the individual to share his/her knowledge. Also, s/he can possibly begin to consider sharing the knowledge for some reason. Then s/he will calculate cost and benefit from sharing the knowledge in his/her mind. Once the calculation is done, the individual will decide whether share or not. Figure 2 illustrates this cognitive process from knowledge acquisition to sharing.

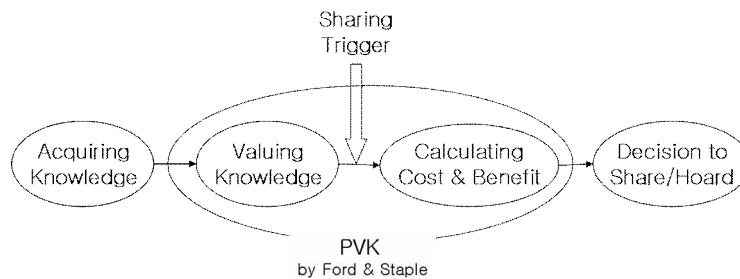


Figure 2. Cognitive Process from Acquisition to Sharing

Individuals may not value their knowledge until they consider costs and benefits. However, this study decomposes PVK by Ford & Staple into modified PVK – valuing knowledge in Figure 2 – and calculation of costs and benefits in order to make cost-benefit analysis easier.

Based on Figure 2, we develop a conceptual model of cost-benefit enabled knowledge sharing as in Figure 3.

Costs

Costs can occur in each transitional process wherever knowledge is managed. Although the process from knowledge acquisition to knowledge sharing consists of only one phase, it can be divided into two phases if cognitive process is accounted for as shown in Figure 2. Table 1 shows the knowledge management process costs and their classification into two categories: acquisition cost and sharing cost. Acquisition costs represent the costs that occur before consideration of knowledge sharing, and sharing costs represent the costs that occur after the knowledge owner takes knowledge sharing into account.

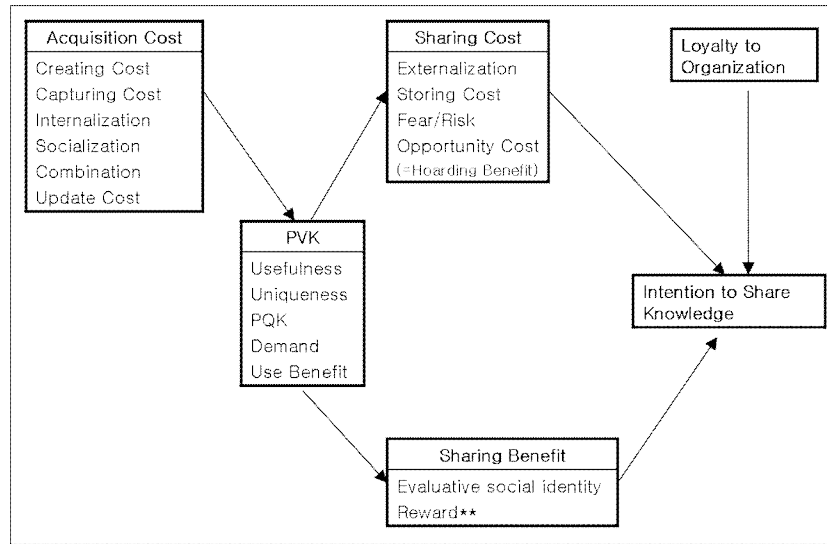


Figure 3. Cost-Benefit Enabled Knowledge Sharing Model in KMS

Costs		Description	Acquisition Cost	Sharing Cost	Note
Conversion Cost (Nonaka 1994)	Internalization	Explicit → Tacit	√		
	Externalization	Tacit → Explicit		√	
	Socialization	Tacit → Tacit	√		
	Combination	Explicit → Explicit	√		
Internal Transaction Cost (Williamson 1996; Shin 2004)	Searching	Finding useful knowledge for given tasks.	√		Capturing Cost
	Storing	Adding one's knowledge to organizational knowledge-base		√	
	Distributing*	Transferring one's knowledge to others			N/A (KMS)
	Applying**	Actually carrying out			N/A
Fear/Risk (Szulanski 1996; Shin 2004; Ford 2004)		Fear/risk for loss of hegemony		√	
		Fear/risk for loss of knowledge		√	
Updating Cost (Detmer et al. 1997; Shin 2004)		Up-to-date knowledge	√		

Table 1. Processing costs from managing knowledge at the individual level and their division

* Not applicable to knowledge management system domain; ** Not applicable (out of scope)

Sharing Benefits

Sharing benefits are distinguished from use benefit which is one dimension of PVK. From the transitional point of view, benefits as well as costs are divided into pre-consideration benefit and post-consideration benefit. Pre-consideration benefit is defined as use benefit and post-consideration benefit is defined as sharing benefit.

Benefits from knowledge include aspects such as being deemed the expert, gaining a sense of pride, deriving a competitive advantage, peace of mind, power, and this knowledge “let me keep my job and get paid” (Ford 2004). Among these benefits,

power, pride and evaluative social identity emerging from “being deemed the expert” or “being more valued by coworker and manager” are sharing benefit, whereas competitive advantage, peace of mind, and appreciation are use benefit. Feedback and reaction enable pride and social identity.

Interestingly, social isolates with special expertise are more likely to share their unique knowledge than socially connected members with unique expertise (Argote et al. 2003). This implies that social identity strongly affects the intention to share knowledge. Constant et al. (1994) find that the higher the perception of self-ownership, the more willing the person would be to share the expertise. Constant et al. (1994) propose this is because the intrinsic benefits of knowledge sharing goes to the “owner” of the expertise.

ANALYSIS

Knowledge standing for non-economic benefits is classified by two categories; intellectual property and non-property knowledge. In legal parlance, knowledge pertinent to intellectual property is transferable to others, but the right of the knowledge cannot be transferred. A patent, for example, gives the creator exclusive rights, but provides information to others (White et al. 2004). Thus, irrespective of who holds the right over certain intellectual property, the knowledge-sharer will not lose the knowledge after sharing it. Instead, it is likely that the knowledge-sharer will receive benefits from sharing it -either monetary or mental.

Further, non-property knowledge is related to education and training and includes network capital and tacit expertise that an engineer or scientist may possess (White et al. 2004). Thus, it is possible for a knowledge-holder to lose his knowledge or hegemony after sharing it. Additionally it is also not easy to convert tacit knowledge into explicit knowledge.

In context, we hypothesize that each construct will be assigned to intellectual property and non-property as in Table 2.

Constructs		Intellectual Property	Non-property Knowledge
PVK	Usefulness	O	O
	Uniqueness	O	O
	PQK	O	O
	Demands	O	O
	Use Benefits	O	O
Acquisition Costs	Creating	O	O
	Capturing	O	O
	Internalization	O	O
	Socialization	O	O
	Combination	O	O
	Update	O	O
Sharing Costs	Externalization	O	O
	Storing	O	O
	Fear/Risk	X	O
	Opportunity	X	O
Sharing Benefits	Evaluative Social Identity	O	O
	Reward	O	O
Loyalty to Organization		O	O

Table 2. Hypotheses - Relevance of Constructs to Types of Knowledge

RESEARCH PLAN

It is established that PVK is a critical factor determining intention to share knowledge. However, PVK is the hidden cognitive process at the individual level, and thereby not accessible. Thus, it is necessary to improve the environment toward increasing the sharing margin by subtracting sharing cost from sharing benefit. The first step for the improvement might be to understand the difference between intellectual property and non-property knowledge. The cognitive process model of

knowledge sharing will help to understand the differences, offer a framework to implement knowledge management system within an organization, and also suggest policies to consider in various situations.

This study shows a possibility that intention to share knowledge might increase, decrease, or remain the same as PVK increases. This is not because PVK has no association with the intention to share knowledge but because the sharing margin moderates the relation between PVK and the intention to share knowledge.

Based on this work, we will empirically show how well the cost-benefit knowledge sharing model fits the data, and if the difference between intellectual property and non-property knowledge results in the different sharing attitude.

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