지식전파 및 공유 수단으로서의 블로그에 대한 탐험적 연구

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An Exploratory Investigation into BLOG as a Tool for Knowledge Transfer and Sharing

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Abstract

In this study, we investigate the possibility of deploying a recently emerging Internet-based technology, called Web log or Blog, to address the problems of knowledge transfer and sharing, particularly in the case of tacit knowledge. We examined the use practice of four blogs and then identified several properties relevant to knowledge transfer and sharing. They include the specific style of blog format, content ownership attribution, posted article organization, communication tools and method, news feed function, and various links from/to outside websites. These features were argued to facilitate knowledge transfer and sharing. In particular, we discussed a great deal about the structure of comments and links as tools for collaboration and idea sharing, which enables the knowledge conversion processes (socialization, externalization, combination, and internalization). We then provide several guidelines to develop blogs as a knowledge management tool.

Keywords : Knowledge Management, Blog, Knowledge Transfer, Knowledge Sharing

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1. INTRODUCTION

Knowledge management is a systemic and integrated approach to identifying, sharing, and applying tacit and explicit knowledge residing in an organization to facilitate effective and productive attainments of organizational work [Alavi and Leidner 1999; Davenport, Jarvenpaa and Beers 1996; Lee 2000; Sage and Rouse 1999]. Among the various activities of knowledge management, effective integration and application of organizational knowledge constitute critical capabilities to create and sustain competitive advantage [Brown and Duguid 1998; Grant 1996]. The effectiveness of integration and application activities is, in turn, directly affected by that of knowledge transfer and sharing activities, because sharing knowledge in organizational memory is the basis of action [Gold, Malhotra and Segars 2001].

There are many studies that investigate knowledge transfer and sharing in terms of knowledge flows [Gupta and Govindarajan 1991; Gupta and Govindarajan 2000a], knowledge diffusion [Appleyard 1996; Robertson, Swan and Newell 1996], absorptive capacity [Cohen and Levinthal 1990], alignment of IT and business [Kearns and Lederer 2003], and in particular knowledge transfer channels [Holtham and Courtney 1998]. While these studies contribute to the understanding of the effect of knowledge sharing and transfer on individual and organizational performance, they do not address the issues such as what kinds of information technology can facilitate the knowledge transfer and sharing activities and how the technologies should be organized to better tackle the problems of knowledge transfer.

This study investigates the possibility of deploying a recently emerging Internet-based technology, called Web log or Blog, to address the problems of knowledge transfer and sharing, particularly in the case of tacit knowledge. A blog is an online journal that contains a collection of observations, stories, news and other items on a typical webpage [Albrycht 2004; Farmer 2004]. By definition, a blog is considered to be a personal and informal communication tool that allows individuals to have one's own space to voice their opinions as well as the opportunity to communicate with others. In this paper, we discuss the problems of knowledge transfer and sharing based on the previous literature [e.g., Alavi and Leidner 2001; Nonaka 1994; Nonaka and Konno 1998; Orlikowski 2002] and the features of blogs that address those problems. We then provide a set of guidelines for designing a corporate blog for facilitating knowledge transfer and sharing followed by topics for future research.

This paper is expected to contribute to the literature in two ways. First, this paper investigates the connection between the structure embedded in blogs and the facilitation of knowledge transfer and sharing in organizations. Second, this study offers a set of guidelines that are likely to influence the effectiveness of knowledge sharing and these guidelines can be tested in the future studies.

2. Issues in Knowledge Transfer and Sharing

Knowledge is defined as "a justified personal belief that increases an individual's capacity to take effective action [Nonaka 1994]", and has been categorized into explicit and implicit knowledge [Alavi and Leidner 2001; Nonaka 1994; Nonaka and Konno 1998]. Explicit knowledge is the formal or codified knowledge that is a usable body of facts and concepts relevant for a job and can be transmitted using systematic language [Alavi and Leidner 2001; Bassellier, Reich and Benbasat 2001; Nonaka 1994; Nonaka and Konno 1998]. On the other hand, tacit knowledge is referred to as the knowledge such as mental model and know-how rooted deeply in individuals' experiences and values [Leonard and Sensiper 1998; Nonaka and Konno 1998]. It is "gained over time by trial and error and through intensity of effort [Nonaka 1994]" and is therefore embedded into an individual's behavior [Bassellier, et al. 2001]. This stickiness or embeddedness of tacit knowledge makes the transfer and sharing of the knowledge difficult, sometimes even impossible [Orlikowski 2002]. In addition, the problems of knowledge sharing result from the fact that organizations do not know what kind of knowledge they have and that employees do not know what their cohorts have or are doing [Alavi and Leidner 2001]. Although it is hard to accomplish, knowledge sharing within an organization or among related organizations positively affects the competitive advantage of organizations [Alavi and Leidner 1999; Alavi and Leidner 2001; Kearns and Lederer 2003; Kogut and Zander 1992; Orlikowski 2002].

According to previous studies, knowledge transfer mechanism can be largely categorized into formal and informal mechanism [Gupta and Govindarajan 1991, 2000a]. Gupta and Govindarajan [1991, 2000a] identify two mechanisms of knowledge transfer as formal integrative mechanisms and corporate socialization mechanisms. They argue that the two different mechanisms render decision-making processes and course of actions different and thus firms carefully mix the two mechanisms to maximize knowledge transfer. Desouza [2003] categorizes the mechanism for tacit knowledge exchange into deliberate mechanisms as a planned interaction mechanism and emergent mechanisms as an informal and unplanned mechanism. He then argues that informal and emergent mechanisms are good to cultivate tacit knowledge exchange because tacit knowledge can be transferred better in an informal setting and new knowledge likely emerges during the transmission. To make the mechanisms work effectively in converting tacit knowledge to explicit knowledge, knowledge management processes including socialization (the process of converting tacit knowledge to new tacit knowledge through shared experience), externalization (the process of converting tacit to explicit knowledge), combination (the process of converting explicit to enhanced and systematic explicit knowledge), and internalization (the process of embodying explicit into tacit knowledge)

have to be incorporated [Nonaka and Konno 1998].

One of the key issues of knowledge transfer mechanism is knowledge transfer channel. Previous studies categorized the knowledge transfer channel into formal and informal, based on formality of knowledge transmission; and personal and impersonal, depending on the deployed medium [Alavi and Leidner 2001; Karlsen and Gottschalk 2004]. Gupta and Govindarajan [1991, 2000a] argue that among the five factors (value of source unit's knowledge stock, motivational disposition of the source unit, existence and richness of transmission channels, motivational disposition of the target unit, and absorptive capacity of the target unit) that affect knowledge flows within multinational corporations, the transmission mechanism richness, in particular formal integrative mechanisms, consistently affects knowledge flows across contingencies.

Some studies highlight that the strength of ties in a network influences the effectiveness of knowledge transfer [Robertson, et al., 1996] in that a weak tie is more effective than a strong tie to create and share new knowledge [Alavi and Leidner 2001]. If the tie among members of a group is very strong, the group may not accept knowledge from outside of the group and the shared knowledge is homogeneous, which will reduce the effectiveness of knowledge transfer and creation. Hence, the degree of the strength of the tie among members is critical to the success of knowledge transfer and sharing given the fact that knowledge in the business context is primarily obtained through social interaction that leads to a network of relationships for information [Cross and Baird 2000].

Other studies emphasize the importance of culture for effective knowledge transfer [Desouza 2003; Karlsen and Gottschalk 2004; Kim, Chaudhury and Rao 2002; Nonaka and Konno 1998; Nonaka and Takeuchi 1995; Orlikowski 2002]. Culture as shared belief systems can guide the behavior of constituents of a group [Hall 1992, 1993; Oliver 1997; Teece, Pisano and Shuen 1997]. The effectiveness and selection of knowledge sharing mechanisms defined in terms of access to the knowledge and use of the knowledge are mediated by environmental factors such as technological change, culture and industry types [Appleyard 1996]. Hence, it is important that firms foster an open and positive culture to high quality and innovation [Hall 1993].

In sum, to make knowledge transfer and sharing effective, firms take into account the issues of knowledge transfer mechanism for explicit and tacit knowledge, formal and informal knowledge transfer channels, the strength of knowledge sharing networks, and cultural openness.

3. The Role of Web Log in Knowledge Transfer and Sharing

As discussed earlier, blog is a recently emerging Internet-based technology. It is an online repository of personal opinion about public issues or personal stories about every-

day life [Albrycht 2004; Farmer 2004]. In terms of knowledge management, it can be regarded as a type of knowledge bin [Walsh and Ungson 1991] or a common place ('ba') for knowledge creation [Nonaka and Konno 1998] as well as a knowledge transfer channel. A blog is expected to provide individuals with a cheap and easy tool to express oneself in a personal space and to be connected to the outside world to communicate with others [Albrycht 2004, Farmer 2004]. Recently, business organizations have eagerly utilized blogs to reach customers and employees and to demonstrate the human-side of an organization to its customers [Wagstaff 2004]. Moreover, they attempt to use their blog as a knowledge management tool [Bradbury 2003].

There are several properties of blogs that allow them to be good knowledge management tools. First of all, the installation and use of blog is relatively easy so that users can easily organize the items in their blogs to express themselves using various functions provided by the software. High possibility of self-expression and attention from others motivate users to transform their tacit knowledge to explicit knowledge even without other incentives involved [Lee and Cole 2003].

Secondly, relatively standardized tools such as RSS (Really Simple Syndication)/XML (Extensible Markup Language) allow users to gather the information from other websites or blogs into one's own blog and to organize them in a chronological order [Albrycht 2004]. This functionality allows users to be connected to outside as well as inside experts to obtain their knowledge. The users can make multiple links to various expert blogs outside of their organization and share very different viewpoints from their own, which may resolve the strong tie problem in knowledge sharing.

Thirdly, blogs provide users with functions to attach comments to the original articles and even put a specific comment in the main title page to complement the original idea. Comments on the original article play a role as a powerful means for collaboration and knowledge sharing [Albrycht 2004].

Blogs as a knowledge transfer and sharing channel can cover informal transmission in terms of formality of channels, but embrace both personal and impersonal knowledge transfer. Although participants of a topic cannot see the others, they can communicate with each other in a personal mood through a threaded conversation using the comment function, which in turn allows other users to observe the texts of the thread. This combination of the main article and comments can be considered to be an important knowledge bin [Walsh and Ungson 1991].

The use of blogs in knowledge management also can facilitate the knowledge conversion processes including socialization, externalization, combination, and internalization, fully or partly. Blogs can deal with the socialization process by enabling the informational network between authors and commentators. By writing up articles about various topics related to one's expertise and posting the articles, blog users make tacit knowl-

edge explicit and useful to other readers. The owner of the articles now can reflect the ideas or comments posted by other readers. This process corresponds to a combination of knowledge. Finally, the authors and commentators can internalize the knowledge posted or discussed in blogs through the discussion processes or text revision processes.

In sum, blogs provide several positive properties for knowledge management including ease of personalization, broad networking, enhanced communication, and interaction to facilitate knowledge transfer and sharing. These properties cannot be easily obtained through other communication media such as email, personal webpage, and bulletin board. In the next section, we discuss the results of an exploratory study on four general types of blogs on the Internet.

4. Research Setting and Methods

To uncover the ways knowledge is transferred and shared among individuals through blogs, we examined and collected data from four unique blog sites over a two month period. The four sites reviewed are : http://blogs.zdnet.com (ZDNet), http://www.dailykos.com (Dailykos), http://blogs.sun.com/roller/(Sun Microsystems), and http://www.scienceblog.com/blogs/(Scienceblog). Each of these blogs was selected based on the size and popularity of the blog, the diversity of blog users, communication tools available within the blog, and overall format and structure of the site. We collected from the four blog sites the information about 1) the number of comments per article posted to evaluate the popularity of a topic, 2) the number of comments within comments to examine the in-depth discussion, 3) the possibility of direct author response to comments to assess the personal communication availability, 4) the number of links of an article to outside world, and 5) the number of comments posted on the main page to check the actual effect of knowledge sharing. In the remainder of this section, the characteristics of each blogsite examined are described.

ZDNet ZDNet (http://www.zdnet.com) is a knowledge web of technology. This site provides technology news in a format that cannot be edited through viewer comments; a directory of technology papers, Webcasts, and case studies; numerous downloadable tools; and reviews of consumer technological products. The links to the blog pages are placed in a prominent and very accessible position on ZDNet's home page. Users may select the blog or blogs they wish to read by one of two methods : First, by linking directly into a particular blog article page under the heading "Recent Blogs" or, second, by choosing to view a page displaying a variety of new blogs tied to a specific subject matter, which is listed on the home page under "New blogs." Individual blogs are organized in such a way that the authors maintain ownership of their work by having their names and faces appear at the top of their blogs. By clicking on this biographical information at the top of a blog, the user is brought to the entire list of blogs

written by that author, including a calendar of archived blogs from previous months.

As a blog site, ZDNet enjoys its popularity in terms of the diversity of authors, readers, and topics. The site format is professionally designed; when a reader opens the home page, s/he will see a listing of news articles (with the most recent listed first), and under each article is a comments link which brings the reader to a page that displays the article s/he selected, followed by any comments that other readers have added to that article in chronological order. Each of these individual article/comments pages has an open invitation for anyone to add a comment to the page; however, this comment will be added, in the order it is received, to the list of other comments and cannot be listed under any particular comment the reader wishes to respond directly to. Further, within each entry, there is a URL posted in the event that readers want to trace back the route he or she has explored. ZDNet allows readers to utilize multiple means of communication, including available RSS feeds and links to other web news reports directly in original text and comments. ZDNet also offers the readers responsible authorship, as each commenter can expect an author to reply to their comments when such action is called for. However, ZDNet controls the content of its pages by subjecting all comments to moderator review. While the existence of moderator review may hinder the free reign of communication through the site, it may also prevent a biased influence of a user on the other readers, as well.

Dailykos Dailykos, a political website with a liberal disposition, is a website dedicated specifically to blog postings, so the reader does not have to seek out a link to find blog pages. Rather, they are the most noticeable part of the site's homepage. The home page of this site brings the user to a somewhat bland list of open thread discussions and short news bits posted by members. From this page, a reader can click on the "link and discuss" tags under each entry that brings up the selected thread plus all comments attributed to it.

Dailykos authors, who, like the commenting user base, are more numerous than their counterparts at ZDNet, retain ownership of their blogs in a similar way to the technical web site. Similar to ZDNet, Dailykos offers users the opportunity to link directly from an individual blog to the diary page of that blog's user. However, unlike ZDNet, this site's links do not include a headshot of the author, and the links to these pages are, in a way, buried in the text, as they are not well differentiated from other links throughout the blogs (such as those linking to information source websites outside of the Dailykos infrastructure). Individual blogs on Dailykos are, overall, organized similarly to those on ZDNet's "New Blogs" open source page and, similarly, the blog listing that one arrives at when directly entering http://blogs.zdnet.com. The similarities are primarily based on the formatting, whereas there is a general page that

displays a number of discussions by different authors and, under each discussion, an optional link bringing the reader to the individual blogsite that elaborates on the topic by including discussion from commenting readers. In this sense, a casual observer may view only the overview pages and attribute full ownership of the blog to the author whose article he glances over, whereas a more fully-involved participant may read the original author's article followed by the numerous comments by multiple users and, in the end, attribute ownership of the blog to the community, rather than to the original author.

To post comments and/or use the site to post individual blogs, a user may become a member free of charge. Once someone becomes a member, s/he can post comments, keep an online diary, and customize the look of his own Dailykos page. All users choose their display options including the default opportunity to view the entire open thread format, so that the reader does not have to click on a "comments" tag in order to view other users' opinions once they are in the "link and discuss" page. Unlike ZDNet, Dailykos offers viewers the option to comment directly to an existing comment, not just to the original author's post. blogs within Dailykos often refer to and link to other, related blogs within the Dailykos site. The special interest orientation of the site, however, with the authors and commenters almost exclusively politically liberal, causes an over-consensus effect, which can be regarded as the drawback of strong tie. The few conservative viewpoints made by commenters tend to be buried under mounds of opposing opinions, as they are refuted heavily by the bulk of the contributing viewers. However, this drawback can be lessened by adopting the function where authors put their articles in "recommended diaries" that would likely support his own point of view, regardless of the views discussed in the blog's comments.

Sun Microsystems' Blog Sun Microsystems' blog consists of a blog community within a corporate web site; available for Sun Microsystems employees to write about anything they want. The site is formatted simply with the home page displaying two listings that motivate the authors to post their views about specific topics : First, the most recent postings by all authors and then the most popular individual blog sites in order of popularity. These two lists, however, are formatted differently from one another. Although they both display the author's name, the recently posted list includes the title and category of the new post and the time it was posted. The 'most popular' list, on the other hand, details the name of the author's overall web log, the number of hits it has received, and a link to the RSS feed.

Unlike any of the other three blogsites we examined, the link to Sun's blog page in Sun's overall web site is not visible, which may indicate that this blog site is developed only for employees. In an attempt to locate the blogsite directly from Sun's homepage, we tried multiple options : search and browsing.

The three terms that we used to locate the blogsite, "Blog", Blogs", and "Blogs.sun.com", failed to bring us directly to http://blogs.sun.com, the main Sun blog page. However, an indirect way to reach the site through Sun's home page does exist. Under the heading "On this Site", a user can choose the link to "News & Events", a page which, on the left side, displays a visual link to the following site, http://www.sun.com/aboutsun/media/blogs/index.html, which lists, among links to individual member blog sites, a link to the main blog community, under the heading blogs.sun.com.

Once in the blog community, however, viewers of Sun's blog pages may observe a greater sense of individual blog ownership than in any of the other sites we examined. Each individual blog page can be designed to the author's specification, although most of them are kept quite standard, including a calendar with links to archived blog postings, an RSS feed, and an individualized list of favorite links in a column on the right, with the continuous web log and links to comments on the left. If a viewer wishes to view any particular blog article, he cannot avoid entering the author's diary-style blog site. As the viewer clicks on the link to his blog of choice, he is transported to the full blog diary of the chosen blog's author, and this diary format allows the original authors to maintain a more veritable grasp on their written work.

This site has many characteristics that differ from the other three blog sites. Although comments are allowed, few blogs attract very many comments. Moreover, the blog page belonging to the company's president does not allow anyone to comment on his postings, reducing his blog to a monologue. E-mail addresses are not included in the blog sites, but it appears that many authors receive comments from other employees via e-mail rather than through comments added to their blogs, according to their announcement in the posted article that the author revised the article based on the comments.

Scienceblog The last blog site examined is Scienceblog, which is a much smaller-scale blog than the others. It covers the special interest orientation of science, which in itself encompasses many distinct disciplines, therefore resulting in a diverse following of authors and readers. In addition to the blogs, other sections of the overall Scienceblog page include surveys, forums, and articles organized by science topic.

Scienceblog is formatted most similarly to ZDNet, in that its homepage (http://www.scienceblog.com) offers viewers much more than just a list of blogs, yet the interactive blogs are emphasized as an important part of the site. Unlike ZDNet, however, Scienceblog *does* list selected individual blogs directly on its homepage in addition to the "Blogs" link (to http://www.scienceblog.com/blogs/) in the list of additional site links. The site's format directs the viewers' attention to the most recent articles first. This is accomplished primarily through the way that the home page includes only the most recent articles, and the

viewer must click on the links to additional pages if s/he wishes to see the older, archived entries on the additional 6 available pages. Moreover, this site offers various features that some of the other blogs are missing, such as XML-based RSS feeds, the ability to reply directly to comments, and a thorough categorization of entries. Ironically, however, these features are hardly ever used, and more specifically, most blog entries do not attract any comments at all.

Similar to the other sites, Scienceblog gives full credit to the authors of each blog. Readers may click on the author's name at the end of any blog abstract or full article to pull up available biographical information about that author. Within an author's biography, the site includes a link to that author's recent blog entries, which are listed in reverse chronological diary format. It is inferred, therefore, that Scienceblog, like all the other blog sites we examined, offers its authors a great degree of implicit compositional ownership.

5. The Major Features of Blogs in Use Relevant to Knowledge Transfer

As discussed above, blogs, regardless of the topic areas, incorporate common features such as self-managed specification of blog format, ownership of the content posted, chronological organization of the articles posted, communication tools including emails and comment function for threaded conversation, news feed function using RSS/XML, and various links to outside websites. These features facilitate knowledge transfer and sharing in three ways: First, they, in particular personalized format and threaded communication, motivate individual users to articulate what they know about specific topics (knowledge externalization) and to participate in social interactions with others through various communication tools, resulting in socialization for knowledge conversion [Nonaka 1994; Nonaka and Konno 1998].

Second, the features allow users to build social networks through direct interaction with both authors and other commenters and to set up knowledge network through various links to inside experts' blogs (strong tie) and outside experts' blogs (weak tie). To make this network strong and legitimate, authors of blog articles offer a means by which to authenticate their claims, thereby allowing readers to feel more confident that the sources of the information they read is secure. The most common way that the blog authors validated their articles is by offering links to their information sources within their blog. This feature is most commonly used by ZDNet and Dailykos, but is also used, albeit more sparingly, by authors on the other two blog sites. A second way that readers can feel more confident about the information they are receiving is the number of respectable web sites that refer to or offer links to the blog in question. For each blog entry that we reviewed, we ran a search using the Google search engine to pinpoint whether any additional web sites reference the specific blog by title. Of the four blog sites we examined, the

blogs from Sun Microsystems and ZDNet had the most references to them from respectable outside web sites, suggesting that the information on these blog sites can be assumed factual.

Finally, the features provide comment functions that are the most effective vehicle for collaboration and sharing ideas [Albrycht 2004]. <Table 1> shows the comparison of blogs with traditional webpages in terms of knowledge conversion modes.

Among these properties of blogs, comment structure or the way of commenting is the most interesting due to its effects on knowledge transfer and sharing. In the context of knowledge sharing, main articles posted in blogs can be viewed as main bodies of knowledge or stable release versions in Linux Kernel development project [Lee and Cole 2003], whereas comments attached to the articles can be regarded as debugging reports submitted by periphery or experimental versions in Linux Kernel development project [Lee and Cole 2003]. This structure is efficient in creating and sharing knowledge because it offers both stability and flexibility in knowledge sharing while motivating users to participate in the process [Lee and Cole 2003, Orlikowski 2002]. <Table 2> illustrates the characteristics of the commenting behavior in the four blogs we investigated.

As discussed earlier, to investigate the possibility of using blogs as knowledge transfer and sharing tool, this study examined the

〈Table 1〉 Comparison of Blogs and Traditional Webpages

Criteria	Blogs	Traditional Webpages
Main Purpose	• An interactive means of reaching out to customers, clients, suppliers, and other members of the supply chain • Used as a way to gather support for an idea, solicit advertising funds, or collect donations	• By large, one-way communication that reaches out to anyone surfing the web • Used to sell ideas or post information in general
Socialization	• Through ongoing dialogues, developing communities • Offers information and comments by the viewers and users themselves • Flexible and usually un-moderated discussion	• A place to welcome those with common interests, but the author chooses who is allowed to participate in the site • Monitored discussion by author
Externalization	• Offers information and comments that come directly from the author • News feed from outside Blogs typically using RSS/XML feeds	• Offers only information and comments that come directly from the author of the homepage
Combination	• Bloggers rely on traditional news sources to edit and fact-check and also incorporate the ideas captured through the comments of other Bloggers	• Authors read original data and filters and edits personally, through whatever means they find appropriate
Internalization	• Updated articles or information frequently manifest how the comments and emails help improve the authors understanding the topic • Frequent update	• Updated only at the author's pace, which shows the authors understanding is not much affected by the others' comments or ideas

〈Table 2〉 Characteristics of the Commenting Behavior

Blog Name	Examined Topic ID[1]	Number of comments[2]			Number of comments within comments	Author response	Number of outside copy	Comments posed on the main page
		P	N	T				
ZDNet	1	3	4	7	0	No	0	No
	2	4	3	7	0	No	3	No
	3	1	0	1	0	No	0	No
	4	2	3	5	0	No	0	No
	5	2	0	2	0	No	0	No
	6	0	0	0	0	No	0	No
	7	1	1	2	0	No	2	No
	8	3	2	5	0	No	1	No
	9	6	6	12	0	No	0	No
	10	0	1	1	0	No	0	No
Dailykos	11	110	5	115	106	Yes	0	Yes
	12	46	0	46	30	No	0	No
	13	346	0	346	291	No	0	No
	14	44	0	44	N/A	No	0	No
	15	179	0	179	N/A	Yes	0	No
Sun	16	0	0	0	0	No	1	No
	17	0	0	0	0	No	0	No
	18	4	0	4	0	Yes	0	No
	19	7	0	7	0	No	0	No
	20	0	0	0	0	No	0	No
	21	0	0	0	0	No	1	No
	22	10	0	10	0	Yes	0	No
	23	12	0	12	0	Yes	0	No
	24	7	1	8	0	No	2	No
Scienceblog	25	1	0	1	0	No	0	No
	26	1	1	2	0	No	0	No
	27	0	0	0	0	No	0	No
	28	0	0	0	0	No	0	No
	29	0	0	0	0	No	0	No
	30	0	0	0	0	No	0	No
	31	0	0	0	0	No	0	No
	32	0	0	0	0	No	0	No
	33	0	0	0	0	No	0	No
	34	0	0	0	0	No	0	No
	35	0	0	0	0	No	0	No
	36	0	0	0	0	No	0	No
	37	0	0	0	0	No	0	No
	38	0	0	0	0	No	0	No

1) The topics examined in this study are listed in Appendix 1.
2) P: positive comments, N: negative comments, T: total number of comments.

blog information pertinent to knowledge expression and communication between blogging participants. They include 1) the number of comments per article posted, 2) the number of comments within comments, 3) the possibility of direct author response to comments, 4) the number of cases an article is copied to outside world, 5) the number of comments posted on the main page.

The number of comments per article posted Among the blogs examined, Dailykos blog has the most comments per article, whereas ZDNet, Sun Microsystems, and Scienceblog have less number of comments per article. The difference in the number of comments may result from the characteristics of the article posted. For example, political issues may provoke the responses positive or negative because the responses to those issues involve the value systems of individuals while technical issues typical in the other blogs are value neutral. Moreover, there exists a difference in comment control systems: free posting versus regulated posting.

For example, Dailykos blog uses a free posting policy for comments, but ZDNet is using a regulated posting policy in which every comment is sent to proper authorities, checked for relevance, and posted as a legitimate comment. The regulated posting may keep the quality of communication and knowledge but may hinder the free flow of knowledge which in turn hampers creative and voluntary knowledge sharing.

As mentioned earlier, there are some blogs that prevent users from posting their comments at all even though blog sites in general are designed to act as open-access forums. However, it is evident that although the comments posting is limited or prohibited, the communication between the author or a blog owner and the readers cannot be avoided. One of the examples is Sun Microsystems' blog. In one particular blog, it is stated that: "… Community at work. Keep the (constructive) comments coming. Looks like everyone loves the new UI. Keep in mind this is a beta [Clingan 2004]." This comment suggests that the author has been receiving comments from peers regarding his/her blog, yet the blog itself shows zero comments. This phenomenon indicates that some people prefer to correspond in a one-to-one format, sharing their ideas only with the person to whom they are responding, and not to the general public [Burke 2001; Kock 2004]. The recipient of the e-mail or phone call could be the original author of the Blog or it could be one of the people who posted a comment on the blog, depending on whom the commenter wishes to contact. One of the reasons that people may wish to correspond in this way, rather than in the open blog format is that some people are averse to criticism and review, and therefore do not wish to have large audiences privy to what they have to say [Costa, Dinsbach, Manstead and Bitti 2001; Dahl, Manchanda and Argo 2001; Kock 2004; Lee and Wagner 2002]. People who do not take well to criticism would not like to see others commenting on or changing their ideas in any way (social

pressure under the presence of others), and so they will therefore avoid putting themselves into a position that will allow their comments or ideas to be thoroughly debated. If a lot of these types of people participate on the Sun Microsystems blog site, then this may help us understand the tremendous difference between the great number of readers and the low number of comments on most of their blogs.

Another interesting phenomenon observed is the number of positive and negative comments per article. In the Dailykos blog, the number of positive (or confirming) comments overwhelmingly outnumbered dissenting (or negative) ones, but ZDNet, on the other hand, often has variable amounts of positive and negative comments. The difference in the number of assenting comments may result from the characteristics of the community. For example, Dailykos is oriented to the liberal side of politics and users who post their ideas are most likely liberal so that their opinions converge; whereas, the other blogsites deal mostly with technical issues including information technology and medical treatment.

The number of comments within comments This feature was examined to find out how the threaded conversation affects the convergence of opinion or leads to the discussion of different aspects of the same topic. As shown in <Table 2>, with the exception of Dailykos, the other three blogs do not have comments within comments, which indicates the participation of users in knowledge sharing activities is limited due to either the site policy of regulating the comment posting or topic irrelevance for lengthy conversion. Another possibility is a medium change from blog comments to email, because email may provide a safer environment or allow in-depth discussion through back and forth feedback [Daft and Lengel 1986; Kock 2004]. This transfer of media is, as discussed above, implicated by the statement in many of articles posted in Sun Microsystems' blog.

The frequency of direct author response to comments <Table 2> shows that there are few direct responses from authors to the comments attached to blog entries. This feature was investigated to figure out the direct communication between the author and commenters as the facilitator for networking among the users and sharing knowledge between experts and the general audience. The direct communication between an expert and his trainees within a community has proven to be an effective means of knowledge transfer [Gupta and Govindarajan 2000b; Kim, et al., 2002; Nonaka and Takeuchi 1995].

The number of cases an article is copied to outside world <Table 2> shows that some blog articles in Sun Microsystems' blog and ZDNet blog are linked to and posted in outside blogs, news website, and even homepages of highly regarded newspapers. This result indicates that blogs with authority in terms of expertise and popularity can act as a source of knowledge and that there exist real

knowledge networks connecting various Blogs or general websites.

Earlier in this paper, we also argue that blogs can function as a knowledge network by providing links from/to inside/outside links as well as using XML-based RSS feed to automatically receive the updates of linked sites or blogs. This feature may lessen the problems of strong tie within an organization where same opinions or knowledge are shared to hinder innovative idea generation [Alavi and Leidner 2001; Kautz, Selman and Shah 1997; Robertson et al., 1996]. Of course, in some cases, this feature may aggravate the strong tie problem because individual users collect the information and knowledge similar to or which back up their own opinions. However, the links from/to other blogs are believed to provide an opportunity to develop weak ties to obtain heterogeneous opinions.

The number of comments posted on the main page This feature was investigated to find out the role of comments as an error fixing method like debugging report in the Linux Kernel development project [Lee and Cole 2003]. <Table 2> show that only one of the blog sties we examined allows comments to be picked to the main page. This feature is frequently used by online newspaper companies to show off their fairness and to provide equal opportunity to opposing opinions. In terms of knowledge transfer and sharing, this feature is very important for correcting errors existing in articles, if any, given the bounded rationality of individuals [Eisenhardt and Zbaracki 1992; Simon 1955]. If there are enough people who review an article, errors or biases will likely be fixed.

6. Concluding Remarks

We examined the use practice of four blogs and then identified several properties relevant to knowledge transfer and sharing. They include the specific style of blog format, content ownership attribution, posted article organization, communication tools and methods, news feed function using RSS/XML, and various links from/to outside websites. These features were argued to facilitate knowledge transfer and sharing. In particular, we discussed a great deal about the structure of comments and links as tools for collaboration and idea sharing, which enables the knowledge conversion processes (socialization, externalization, combination, and internalization). Through this open, informal, and integrated communication structure, users can enjoy a personal but connected space where part of socialization (tacit → tacit), externalization (tacit → explicit), combination (explicit → explicit), and part of internalization (explicit → tacit) are supported. I expect the readers to gain some insight into the very nature of blogs as a knowledge management tool when they design knowledge management systems. In particular, the role of comments and reply in facilitating tacit knowledge transfer and sharing need to be taken into account as the key to boost up the knowledge exchange between and among employees. The recognition

of the participants, one of the most important facilitator for knowledge exchange, can be gained through article copied to outside (for authors) and frequent author response to comments (for the commentators). The role of organizations will lie in encouraging employees to participate in these activities, employing easy-to-use tools, and designing compensation schemes.

In terms of conclusion, we address in the remainder of this section several issues of blog organization as a knowledge management tool. Grant and Baden-Fuller [1995] argue that knowledge domains in a firm should match the product domains the firm produces. A perfect congruence of knowledge domains with product domains allows firms to maximize the exploitation of the firms' knowledge. On the contrary, inconformity of knowledge domains with product domains makes knowledge management efforts useless [Kim et al., 2002]. Therefore, when organizations design blogs for knowledge management, they have to understand what they have in terms of knowledge and who has the knowledge and then motivate the experts to actively participate in blog communication [Desouza 2003; Orlikowski 2002]. Motivating employees to take part in blog communication is critical to the effective knowledge transfer and sharing, but it is not easy to accomplish [Desouza 2003]. As in the practice of the four examples, placing the author's name in the article as main author or contributor is a good method to encourage employees to contribute. Rewarding the employees who post the most popular or excellent article based on the commenters' evaluation is another way of boosting up the use of blogs as a knowledge management tool. To this end, it is recommended that companies specify rules for knowledge transfer and sharing and identify roles of employees to facilitate the process [Davenport and Prusak 1998; Kim et al., 2002].

Rules may include (a) meta rules regarding the procedures facilitating the knowledge transfer and sharing (b) rules concerning specific knowledge which can be reused [Davenport and Prusak 1998] (c) rules regarding rewards based on the contribution of employees to knowledge transfer and sharing. Roles are defined based on division of labor, a source of dynamism and efficiency [Brown and Duguid 1998], for knowledge transfer and sharing. Kim et al. [2002] categorize the roles in knowledge integration into builders, designers, users, and owners. Builders convert tacit knowledge into explicit knowledge through rules, while designers set up knowledge agendas in which the required knowledge is listed. Users are the people who utilize extant knowledge and evaluate its relevant to the tasks they take charge of. Owners are knowledge activity sponsors and chief advocates who are responsible for budgeting money and time to support knowledge activity and for rewarding or punishing. However, in the context of blog use for knowledge transfer and sharing in an organization, authors of the main articles can be the builders, designers, and users, because they may have their own design of the knowledge agenda to be shown in their blog, elicit

the implicit knowledge they have to the explicit realm of knowledge, and read and utilize the knowledge posted by others. Commenters can be both users and builders, because by posting their comments, they can correct or at least enrich the content posted by the author.

The main problem in the use of blogs as knowledge management tool lies in the owners' role as an advocate. If the users perceive that their companies observe or monitor their activities in the blog pages, they may not stay in the blog or reveal what they know. Therefore, company's intervention should be limited [Bradbury 2003], but owners can act like an invisible hand that establishes rules of game and makes sure the blog works. Another issue for the owner is related to information control. Some type of information impulsively posted by blog users (either from within the corporation or external participants) could be troublesome to the corporation. For example, employees may record items in their blogs that "could someday be used against the company in a lawsuit or simply to disclose to the outside world confidential information or strategies" [LeClaire 2003]. Li [2004] suggests that corporations must provide guidelines in the form of policies and a "code of ethics" including the ownership and legitimacy of content and confidentiality policy to regulate the actions of both employees and external bloggers on their site.

This study is purely exploratory to explain the features of blogs as a knowledge management tool. Future research should investigate issues such as how the features identified in this study affect the perception of effectiveness of blogs, user satisfaction, and eventually the performance of individual users; which functionality should be added to make the blog an effective knowledge management tool; and how the blog can change the practice of knowledge transfer and sharing in organizations. By answering these questions, as Straub et al., [2002] and Straub and Watson [2001] called for, the research that explains the development and use of net-enabled systems, future research contributes to the understanding of the effect of networked applications on organizations.

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Appendix 1

1. Study finds almost a third of computer users growing complacent about cyber threats
2. Patent table gets turned against Sun's Schwartz
3. Enterprise wikis getting interesting
4. ROFL of the Day : "WMA is an open standard"
5. Whew! That's one cherry of an OS!
6. France gives the green light to cell jamming
7. MySQL to leverage Microsoft's open source software
8. Outsourcing : mentor capitalist addresses social policy
9. Intel's Andy Grove rabid about lack of flu vaccine
10. One down. One to go. IBM joins Liberty Alliance.
11. Summing up Cheney
12. Iraqi WMDs? Nope. It's Official. … Again.
13. Open Thread : Dailykos http://www.dailykos.com/story/2004/10/6/205118/575
14. Sure, Bush "met with" the Black Caucus in Congress.
15. The smoking gun on voter registration fraud : Nathan Sproul
16. I Believe in IP
17. The Clingan Zone-Netbeans 4 Beta 2
18. The Clingan Zone-Context is worth 1000 Words
19. Mono: Dead on Arrival
20. Duck and Kangaroo are Delicious
21. Kangaroo is Delicious (and the end of my political career)
22. Friday Free Stuff
23. Sun Ray Girl (Squared)
24. Hackers and Patents
25. Ironic Viruses
26. Terrific Image from ISS of Hurricane Ivan
27. Strange-Looking Rocks in Hawaii
28. Incidents and Accidents
29. Rich stellar clusters may be "dwarfed"
30. Big Rip is on the Way
31. Distant quasars and growth of supermassive black holes
32. Cosmo-LEP finds strangelets in cosmic rays?
33. Women in Science
34. Where is the MTBE, ethanol, energy or environmental debate in this election?
35. Plate Tectonics and Fusion
36. Peer to Peer
37. Ground Meat Fat Testing
38. Yeah, but were the jokes this good on the Titanic?

저자소개

김 용 진

서강대학교 경영학과 부교수로 재직중이며 뉴욕주립대-버팔로에서 박사학위, 서강대학교에서 MBA, 그리고 서울대학교에서 경영학 학사를 취득하였다. 뉴욕주립대-Binghamton에서 조교수로 재직하였으며 주요 연구관심분야는 지식경영, 서비스 경영 및 혁신, IT 프로젝트와 평가, 그리고 전자상거래 등이며 주요 논문을 MIS Quarterly, Communications of the ACM, Decision Support Systems, JITAA, Information Systems Frontiers, International Journal of Information Management, Knowledge and Process Management, Communications of AIS, 그리고 Journal of Internet Commerce 등에 발표하고 있다.

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