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“It is what one does”: why people participate and help others in electronic communities of practice

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Abstract

Advances in information and communication technologies have fundamentally heightened organizational interest in knowledge as a critical strategic resource. However, organizations are finding that members are often reluctant to exchange knowledge with others in the organization. This paper examines why. We review current knowledge management practices and find that organizations are treating knowledge as a private good, owned either by the organization or by organization members. We propose that knowledge can also be considered a public good, owned and maintained by a community. When knowledge is considered a public good, knowledge exchange is motivated by moral obligation and community interest rather than by narrow self-interest. We provide support for the public good perspective by providing results from a survey examining why people participate and share knowledge in three electronic communities of practice. The results indicate that people participate primarily out of community interest, generalized reciprocity and pro-social behavior. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Knowledge management practices; People participation; Electronic communities

1. Introduction

Knowledge has long been recognized as a valuable resource for organizational growth and sustained competitive advantage, especially for organizations competing in uncertain environments (Miller and Shamsie, 1996; Penrose, 1959; Winter, 1987). Recently, proponents of a knowledge-based view of the firm have argued that knowledge is the firm's most important resource because it represents intangible assets, operational routines and

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creative processes that are hard to imitate (Grant, 1996a; Libeskind, 1996; Spender, 1996). Individual learning and new knowledge creation occur when people combine and exchange their personal knowledge with others (Kogut and Zander, 1992; Nahapiet and Ghoshal, 1998). Thus there is a growing awareness of the importance of creating a systematic approach to knowledge sharing and the generation of knowledge flows.

Information and communication technologies, in the form of knowledge management systems (KMS), have been proposed as effective tools to support knowledge sharing. Alavi and Leidner (1999, p. 1) define KMS as “information systems designed specifically to facilitate the sharing and integration of knowledge.” However, field studies in diverse settings indicate that employees frequently resist sharing their knowledge with the rest of the organization (Ciborra and Patriota, 1998). In addition, knowledge is ‘sticky’ and does not flow easily throughout the organization even when knowledge is made available (Szulanski, 1996). The critical issue then, is understanding the social, cultural, and technical attributes of KMS that encourage knowledge exchange (Holsthouse, 1998).

Recent research on organizational knowledge practices suggests that there are two main perspectives underlying the design of KMS: knowledge as object and knowledge embedded in people. The first perspective views knowledge as object that exists independently of human action. It is foremost a private good that can be described along a variety of dimensions such as tacit–explicit, universal–local, declarative–procedural, or sticky–fluid. When knowledge is considered a private good, knowledge can be appropriated by organizations or exchanged as any other commodity (Davenport and Prusak, 1998).

The second perspective, knowledge embedded in people, challenges the disembodied approach to knowledge. This perspective views knowledge as not easily separable from its human actor, and is only meaningful and actionable to those who are already knowledgeable (Hansen et al., 1999). Knowledge is still considered a private good owned by the individual, and its development and exchange occurs through one-to-one interactions.

There is a third perspective of knowledge, one that has only received peripheral attention: knowledge embedded in a community. This perspective views knowledge as a public good that is socially generated, maintained, and exchanged within emergent communities of practice (Brown and Duguid, 1991; Lave, 1988; Lave and Wenger, 1991). Knowledge is an intangible resource that can be shared and spread throughout the community without losing its value, nor being consumed (used up) in the process of transfer. This unique aspect of knowledge suggests that knowledge can be managed as a public good. A public good is a commodity that can be provided only if group members contribute something towards its provision; however, all persons may use it (Komorita and Parks, 1992). When people consider knowledge a public good, people are motivated to share it with others due to a sense of moral obligation rather than an expectation of return.

In this paper, we investigate the implications of treating knowledge as a public good versus private good for knowledge exchange. We address the question of why people contribute time and effort to the provision of knowledge as a public good given the propensity for people to act out of self-interest. The paper is organized as follows: first we start with a comparison of the three perspectives on knowledge. Section 2 draws on previous research to discuss the individual motivations and implications for knowledge sharing and exchange. We then present results from a survey of 342 people participating in three electronic communities of practice to generate insights into why people participate

and voluntarily exchange valuable, personal knowledge with other members in the community. Based on the results, we provide insights and suggestions for guiding the management of knowledge as a public good, and discuss implications for organizations.

2. Theoretical perspectives

In this section, we compare the three perspectives of knowledge (knowledge as object, knowledge embedded in individuals, and knowledge embedded in a community) with respect to the definitions of knowledge and organizational knowledge, attributes of the KMS used to support knowledge flows, assumptions of ownership, motivations underlying exchange and critical implications. The comparisons are summarized in Table 1.

2.1. Knowledge as object

The knowledge as object perspective assumes a positivist, neo-Kantian view of knowledge, defined as “justified true belief” (Nonaka, 1994; Spender, 1996). This perspective assumes that knowledge can exist independently of human action and perception (Townsend, 1993). Knowledge is conceived of as some knowable truth that can be codified and separated from the minds of people. According to this perspective, the goal of knowledge management is to convert the knowledge residing in the minds of people, into structural assets owned by the firm and stored in the firm’s knowledge management system. Therefore, organizational knowledge is defined as the contents of organizational memory, including codified knowledge stored in documents, procedures and KMS (Walsh and Ungson, 1991).

Once knowledge is codified and made a structural asset of the organization, the knowledge can be transferred to others regardless of the location of the individual who contributed the knowledge, it can be shared and built upon throughout the organization, and the knowledge is retained as an asset of the firm even if the contributor leaves the organization. KMS are designed to encourage codification, storage and transfer, using a common database or ‘knowledge repository’, that stores codified, text-based knowledge as well as video, audio, and graphics (to accommodate knowledge that is difficult to articulate). In addition, tools such as search engines and intelligent filters are required to assist knowledge seekers locate requisite knowledge.

The knowledge as object perspective assumes that knowledge is owned by the organization, rather than a personal asset of the individual. So even though the knowledge may reside within the minds of individuals, this view of knowledge assumes that people will codify and exchange this knowledge with the organization just as they would engage in any other exchange or any other work practice. Therefore, when knowledge is viewed as an object owned by the organization, knowledge is considered a private good, and people codify and share their knowledge for the same incentives that are provided for other work practices such as pay, promotions and bonuses.

However, researchers have clearly demonstrated that in many cases knowledge is not like other commodities. People are not necessarily willing to share all types of knowledge (Constant et al., 1994), and organizational culture, not technology, has a greater impact on whether people exchange knowledge (Orlikowski, 1996). In addition, an increase in the

Table 1
Knowledge strategies and key characteristics

	Knowledge as object	Knowledge embedded in people	Knowledge embedded in community
Definition of knowledge	Justified true belief	That which is known	The social practice of knowing
Organizational knowledge	Contents of organizational memory including documents and electronic databases	Sum of individual knowledge	Knowledge existing in the form of routines and shared languages, narratives and codes
Technologies that support exchange.	Knowledge repositories and intelligent search agents	E-mail, phone, knowledge maps, and directories	Discussion groups, listservs, chat rooms, white boards
Assumptions and design implications	Knowledge is codified and becomes a structural asset of the firm.	Knowledge exists in the minds of people and is difficult to share.	Knowledge develops in the context of a community.
	Knowledge is decontextualized.	Requires identification of experts and interaction for the transfer of tacit knowledge.	Members immersed in knowledge flows.
	Assumes new knowledge creation occurs from increased access to codified knowledge.	Potential information overload for experts.	Leverages people's desire to participate in a community.
Knowledge ownership	Organization	Individual	Community
Motivations for exchange	Self-interest	Self-interest	Moral obligation
Promotion of knowledge exchange	Extrinsic and financial rewards.	Reputation, status, obligation.	Generalized reciprocity, self-actualization, access to community.

availability of knowledge may not translate into new knowledge creation. The codification of knowledge only increases the amount of ‘static’ knowledge available to individuals, but does not ensure that people actually access this knowledge. In many cases, people seek information that is the most easily accessed (such as asking co-workers), rather than search for the best information (O’Reilly, 1982). Finally, the knowledge as object perspective presumes that knowledge can be codified and separated from the minds of individuals. The basis for the next perspective recognizes that oftentimes knowledge is difficult to articulate, codify, and separate from the minds of human actors.

2.2. Knowledge embedded in individuals

This perspective views knowledge as inseparable from people, and defines knowledge as “that which is known” (Grant, 1996b), suggesting that knowledge resides only in the minds of individuals. Only people can ‘know’ and convert ‘knowing’ into action, and it is the act of thinking that can transform information into knowledge and create new knowledge (McDermott, 1999). In addition, people seem to know a great deal more than they can articulate. This tacit component of knowledge has a personal quality which makes it hard to formalize and communicate, and is deeply rooted in action, commitment, and involvement in a specific context (Polanyi, 1962). Some researchers even argue that tacit knowledge has greater potential for creating competitive advantage because once knowledge is codified it is easily replicated (Conner and Prahalad, 1996; Starbuck, 1992). Organizational knowledge from this perspective is the sum of the knowledge in the minds of an organization’s employees, and organizational knowledge is increased through the learning of individuals, or adding new people to the organization (Simon, 1991).

The knowledge embedded in people perspective focuses on the management of human resources. Since this perspective views knowledge as difficult to codify and suggests that knowledge loses its value once codified, the goal of KMS is to connect experts with knowledge seekers. KMS are used as a communication device, linking individuals and promoting one-to-one interaction. Tools such as on-line directories and knowledge maps that identify ‘who knows what’ in the organization are critical for supporting this perspective. In addition, e-mail systems and intelligent e-mail systems (systems that have automatic pointers to designated experts based on the subject matter) have also been proposed as effective technologies.

According to this perspective, knowledge is not owned by the organization, but rather resides within the minds of individuals. Therefore knowledge is treated as a ‘boundary resource’, a relationship-specific asset where the asset is put to use for the organization, but the asset itself resides within an external constituency, in this case the worker (Nanda, 1996). When knowledge is viewed as an individual asset, organizations must recognize that individuals have control over their personal knowledge and can do what they wish with it. Choices include: sharing their knowledge with others, disclosing only some elements of their personal knowledge, keeping their knowledge secret completely, or leaving the firm and taking their knowledge with them. Research demonstrates that when knowledge is perceived to be ‘owned’ by the individual, people are more likely to exchange their knowledge for ‘intangible’ returns such as reputation and self-esteem (Constant et al., 1994; Jarvenpaa and Staples, 2000). In addition, social exchange theory

suggests that expertise is exchanged for status, respect, compliance, and obligation (Blau, 1964). Thus, the knowledge embedded in people perspective predicts that knowledge exchange is motivated by self-interest, however, the returns (reputation, self-efficacy, and obligation of reciprocity) are intangible.

One limitation of the knowledge embedded in people perspective is that knowledge is not converted into a structural asset of the organization. Knowledge is under the control of the individual, it is not easily transferable, and can be lost if the person leaves the organization. In addition, KMS based on knowledge maps, pointers to people, and e-mail must be accurate and up to date. Also, these systems can potentially exclude people who may have the answer to a particular question, but have not been identified as experts in the area. Another issue is that these types of systems could potentially lead to information overload for an organization's experts. Instead of experts focusing their time and attention on creating new innovations, their role shifts from that of knowledge creators to knowledge disseminators. In addition, ethnographic researchers examining how work is actually performed suggest that knowledge is not merely an individual asset, but that knowledge creation and transfer are social phenomena and an integral part of a community (Brown and Duguid, 1991; Wenger, 1998). This point is explored in the next perspective.

2.3. Knowledge embedded in community

Although organizations are focused on the first two perspective for guiding knowledge management practices (Hansen et al., 1999), organizations interested in enhancing knowledge exchange should consider a third perspective, a community perspective, that uses KMS to develop and support communities of practice. This perspective defines knowledge as "the social practice of knowing" (Schultze, 1999), and emphasizes that learning, knowing and innovating are closely related forms of human activity and inexorably connected to practice. Brown and Duguid (1991) argue that knowledge detached from practice distorts and obscures the intricacies of that practice, and that organizations are best conceptualized as a collection of overlapping communities of practice. Each community develops its own language, shared narratives and codes, and knowledge is best understood within the context of its community (Boland and Tenkasi, 1995). Learners do not receive or even construct abstract, objective, individual knowledge; rather they learn to function in a community (Brown and Duguid, 1991).

The knowledge embedded in community perspective suggests that knowledge supercedes any one individual, is highly context dependent and is embedded within a community (Brown and Duguid, 1991; Lave, 1991; Orr, 1996; Wenger, 1998). This view attempts to locate organizational knowledge and knowledge creation within distributed, multi-actor routines rather than individual minds (Araujo, 1998). Therefore, organizational knowledge from this perspective refers to the overlapping and common knowledge, which transcends individual members and exists in the form of organizational routines (Grant, 1996b; Nanda, 1996), and is embedded within communities of practice (Brown and Duguid, 1991).

If knowledge is embedded in a community, KMS are best utilized to enable discussion, mutual engagement, and exchange between members of a community of practice. These systems include collaborative technologies such as listservs, electronic discussion groups,

electronic bulletin boards and chat facilities. Knowledge sharing is enabled through mechanisms that support posting and responding to questions, sharing stories of personal experience, and discussing and debating issues relevant to the community.

The knowledge embedded in community perspective views knowledge as collectively owned and maintained by the community. Knowledge exchange occurs primarily through open discussion and collaboration, creating an open knowledge forum supporting the dynamic interchange of ideas. Knowledge is considered a public good where members of the community collectively contribute to its provision and all members may access the knowledge provided. From this perspective, the motivation for knowledge exchange is not self-interest, but care for the community (von Krogh, 1998).

Electronic communities can overcome the limitations of the first two perspectives by providing access to a group of peers dealing with similar knowledge issues. Through this dynamic process of interchange, knowledge is constantly being regenerated and recontextualized, thus maintaining its relevance to the community. Expertise does not have to be located, tracked and kept up to date; all individuals with an interest in the practice are able to participate and learn (Lave and Wenger, 1991). Knowledge exchange via open communities reduces the risk of someone having knowledge but being excluded from the exchange, and also reduces the potential information overload on an organization's experts by distributing the obligation to maintain the community to all members.

3. Motivations for knowledge exchange

The underlying motivations for why people exchange knowledge are fundamentally different across these three perspectives. The motivation to exchange knowledge is affected by whether the decision to share is viewed as primarily economic and motivated by self-interest, or non-economic and motivated by community interest and moral obligation. Different norms govern people's behavior in economic and non-economic spheres of activity and appropriate behavior varies according to context and the nature of the goods being exchanged (Fukuyama, 1995). Thus whether knowledge exchange is viewed as an economic or non-economic exchange is socially constructed and depends upon individual perception and contextual factors such as organizational structures and incentives (Pillutla and Chen, 1999).

The knowledge as object and knowledge embedded in people perspectives view knowledge as a private good, owned either by the organization or the individual. In such cases, people exchange their knowledge through market mechanisms in order to receive commensurate benefits. They are motivated by self-interest and are less likely to exchange knowledge unless provided with tangible returns such as promotions, raises, and/or bonuses, or intangible returns such as reputation, status and direct obligation from the knowledge seeker.

With a public good, the economically rational action is to free-ride, in other words, consume the public good without contributing to its creation or development. The motivation to maximize self-interest does not adequately explain why people contribute to public goods when it is not rational to do so. Therefore, the motivation to exchange knowledge as a public good goes beyond the maximization of self-interest and personal

gain. People do not act only out of self-interest, but forego the tendency to free-ride out of a sense of fairness, public duty, and concern for their community (Schwartz, 1970). People often behave altruistically and pro-socially, contributing to the welfare of others without apparent compensation.

Recent research suggests that work units behaving as focused communities are more innovative (Judge et al., 1997). When people are motivated by moral obligation they are willing to work harder and are more likely to persevere in the face of adversity than people acting out of self-interest (Etzioni, 1988). In addition, research in face to face settings indicates that greater self-interest reduces knowledge sharing (Constant et al., 1994), and people are less likely to use collaborative technologies to share information perceived to be owned by the organization (Jarvenpaa and Staples, 2000).

Research also suggests that introducing tangible rewards in return for the provision of a public good promotes self-interested behavior, reduces intrinsic motivation, and destroys the public good (Deci, 1971, 1972). Although extrinsic rewards provide temporary compliance, these rewards also rupture work relationships, inhibit organizational learning and undermine interest in the work itself (Kohn, 1993). Therefore, organizations promoting knowledge exchange by establishing knowledge markets and providing tangible incentives could actually be encouraging hoarding behavior and competitive actions, diminishing the free flow of knowledge in the organization.

In the following sections we examine long-standing, vibrant electronic communities, where community members voluntarily contribute their knowledge to the public good. The goal of this examination is to provide insights for organizations trying to motivate their members to share knowledge as a public good and develop electronic communities of practice. Specifically, we examine whether people participate in these communities due to motives of self-interest, or if people participate and help others out of concern for the community. Finally, we examine what types of returns (either tangible or intangible) people receive from participation.

4. Method

4.1. Research setting and analysis

In this study, we examined three Usenet newsgroups. The Usenet uses Internet protocols to facilitate message exchange between networked computers and has grown to include over twenty-five thousand different interest newsgroups with more than half a million postings per day (Dern, 1999). Newsgroups are self-organizing, electronic forums where issues associated with the topic of the newsgroup are discussed. These newsgroups are similar to bulletin boards where people post and respond to messages in an asynchronous, text-only messaging system. Contrary to face-to-face groups, electronic communities are open to anyone interested in participating and have no limit on group size. Participation in the community is voluntary and occurs when a message is posted, becoming visible to all readers. Little information about participants is available except for an e-mail address and what the poster voluntarily chooses to disclose (see Kollock and Smith, 1996; Sproull and Faraj, 1995).

We chose three technical communities (comp. lang c++, comp. objects and comp. database) for this study because they were open communities dedicated to developing valuable programming knowledge in rapidly changing technical fields. All message activity was collected for a period of seven-weeks. The seven-week time frame was deemed necessary to control for daily or weekly peaks in group participation, while maintaining the data set size at a manageable level. Using computerized means we analyzed the saved messages and created an e-mail list of unique participants, and sent each participant a survey via the e-mail address provided to the group. We asked each identified participant to provide information as to why they participate and help others. We received open-ended responses from 342 participants, and performed content analysis on the open-ended responses to develop categories describing why people participate and help others in these communities (Holsti, 1969; Krippendorff, 1980). We chose content analysis because this method provides a richness to the data and a deeper understanding of the actual motivations underlying participation without imposing a pre-determined theoretical structure. We began the content analysis by categorizing comments into three general categories: tangible returns, intangible returns, and community interest.

5. Results

Since comments were openly solicited, one participant could list multiple motivations for participation, thus a total of 531 comments were categorized during content analysis. Of these 531 comments, 23 did not fall into a coherent category, resulting in 508 comments for the analysis. Table 2 provides a description of our results including a listing of categories, the number of responses in each category, and some typical responses. In addition to the pre-developed categories namely the tangible returns, intangible returns, and community interest, the comments also provided insights into why people do not help others, as well as factors that detract from participation in the community.

5.1. Tangible returns

Some individuals (reflected in 21.5% of the comments) participate in the community specifically to generate ‘tangible’ returns. In electronic communities, these returns include access to useful information and expertise, answers to specific questions, and personal gain. There are many facets as to what people consider useful: actually receiving help when seeking advice, the help received is delivered quickly, and the information provided in the community is valuable. For example, posting questions to the community can be a fast way to get answers to complex problems. As one person notes “I have often gained valuable information very quickly. Searching for resources, algorithms or the general experience of others in the traditional office environment is very slow and haphazard. The use of newsgroups — no matter how much geek-speak or spam is present — has been a boon in the past.”

In addition, some members indicate that the information available in the community is up to date, not available via other sources, and would otherwise be impossible to find: “There are also new/different tools/products that people use in development, performance tuning, etc. You would have to be very lucky to find these items discussed/advertised in

Table 2
Results of Content Analysis and Sample Comments

Categories	Number of comments	% of total comments	Sample comments
Tangible returns	109	21.5%	
Useful — info valuable	74	14.6%	Great way to get answers to technical problems. The responses are usually accurate, and provide greater detail than I get by looking the answer up in a text.
Answer to specific question	19	3.7%	this NG is one I visited purely to collect one piece of advice; it's not one I normally visit on any regular basis. I don't contribute or expect to, because I have little expertise in this topic area; that's why I visited... to ask advice.
Personal gain	16	3.1%	I am a member of a computer object because I help promote books from The MIT Press that relate to the subject matter. I regularly post announcements regarding our new books to the newsgroup.
Intangible returns	101	19.9%	
Enjoyment/entertaining	33	6.5%	I have always enjoyed sharing my experiences/knowledge with others.
Learn	68	13.4%	It keeps me 'on my toes' even when I'm not doing C++ coding at work. (been doing a lot of JAVA lately). Beginners ask the darndest questions and make you think a little bit.
Interaction with a community	213	41.9%	
Multiple viewpoints	28	5.5%	Newsgroups are one of the few places one can routinely see direct interaction between people with different skill levels as well as completely different sorts of both technical and cultural backgrounds. It's quite interesting to me to watch the differing approaches people take to problems, and different ways they think about things.

Table 2 (continued)

Categories	Number of comments	% of total comments	Sample comments
Peer group	59	11.6%	Other's experience is the best substitute for personal experience.
Altruism/pro-social behavior	50	9.8%	As I say, what amounts to religious conviction. This is simply what one _does_. How can the world improve, unless we improve it?
Reciprocity	68	13.4%	Good information can be learned from this newsgroup. If I gain some knowledge I feel it only right to give back and help someone else.
Advance the community	8	1.6%	I think an active participation in the exchange of knowledge benefits the technical community as a whole.
Barriers to participation	85	16.7%	
Group related barriers	51	10.0%	I laughed when I got this...I've just stopped subscribing to that group (two days ago). After three years of reading it I finally got sick and tired of XXX's insults to others and his inability to respond rationally in arguments. However, computer object has a schism between XXX and (just about) everybody else; the constant arguments that result from this have diminished how useful the newsgroup has become over time.
Obstacles to participation	16	3.1%	I would participate more frequently if my work environment included news server access.
Unhelpful	18	3.5%	Of course, I would like also to give my knowledge to others, but I give much less frequently than I get. It is because lots of people who have much more knowledge than I are in newsgroups. I believe it is very sound situation. I think irresponsible postings from novice people often confuse other people.

any trade mags. Many of these tools are free, but can be very valuable.” Finally, not only are electronic communities fast and useful sources of information, but these communities are also excellent sources of expertise, direct from leading experts: “the newsgroups provide perhaps the most direct line in existence to the leading authorities on the subject matter at hand: many c++ standard committee members participate on a regular basis. If you need clarification on a section of the standard, you can often get it directly from the person who wrote it...”

Another tangible return is to receive help on a specific problem. However, these comments also indicate that people who participate to have specific questions answered are typically acting out of self-interest, and do not participate regularly in the community: “FYI, I only ‘visit’ newsgroups when I have a specific question. I do not have the time to regularly follow groups threads. When I have questions, though I think newsgroups are one of the very best sources of solutions.”

Finally, some people participate in the community to receive some sort of personal gain or status related to their professional position. Participants indicate that the community is an important resource to enhance standing in the profession, to establish a reputation that will hopefully translate into a job, or even to generate clients for consulting business. As this person notes, participation can generate some sort of personal gain: “There are, occasionally, spin-offs of newsgroup participation. Just by being seen to be involved and providing well thought out responses to the threads, offers of consultancy work may arise from time to time. So, the time expense can be seen as a bit of an investment. If people reading the newsgroup like what you say and have a specific problem to solve they would consider asking you to assist them to solve it.”

5.2. *Intangible returns*

While some comments demonstrate that people participate for tangible returns, others indicate that participation in the community is also a source of intangible returns in the forms of intrinsic satisfaction and self-actualization. For instance, 19.9% of the comments note that participation in the community is challenging, helps to refine their thinking, and contributes to the development of new insights. In addition, these comments reflect that participation in the community ‘is fun’ in general, and many people note that they participate in the community because they enjoy learning and sharing with others. This person notes: “I enjoy sharing knowledge that empowers people to help themselves” and “It’s nice to feel like an expert, that someone values the knowledge that has become everyday for you.” Also, some people participate because it makes them feel confident in their expertise, and they get the chance to show-off, like this person: “I get a kick out of feeling competent.”

Other comments reflect that people participate in the community to enhance their own learning and self-efficacy. People note that participation in the community results in learning and keeping abreast with new innovations. Some comments even make the distinction that participation in the community is important because it provides access to knowledge rather than static information: “I joined explicitly to acquire knowledge as opposed to information, to make up for my inexperience.” Others participate because they feel that learning and keeping current on new innovations and issues in the community is

important: “The primary reason that I read newsgroups are to stay abreast with the current thinking by the leaders in the field.”

Finally, people note that answering questions is a challenge, and that working through problems helps to refine their own thinking. As this person notes, the process of articulation can result in solutions: “Quite often answers to problems that are plaguing you can be gained by educating someone else about the problems you face. The case is that, during the process you will see the answers for yourself (a case of to know a subject well, prepare to teach it to someone else).” In addition, participation and helping others strengthens their own skills: “This is also a great experience for me because it helps me strengthen old concepts. If you can teach it then you truly understand it!”

5.3. Community interest

The majority of comments received (41.9%) reflect a strong desire to have an access to a community of practice. These comments indicate that people are participating in order to exchange knowledge pertaining to practice, and that they value the exchange of practice related knowledge within a community of like minded members. In addition, these comments indicate that people do not use the forum to socialize, nor to develop personal relationships: “However, I am not interested in developing personal relationships with other newsgroup participants — only knowledge exchange on as professional a level as possible.” Many people value the processes of exchange, interaction, and the availability of feedback more so than simple access to information. People note that they gain insight from responding to questions and then comparing their response with others, gauging their ideas and expertise: “I realize that there are many solutions to each problem, and that by proposing mine, it may get critiqued, and I will find a better solution, or acknowledgment that mine is OK.” People also find that multiple minds are better than one, making access to a community of others important for innovation: “Someone posts a problem and I reply with a solution. I then get feed back about the viability of my solution. Others may modify it or I may adopt and enhance the solutions of others. I often come away with ideas that no one on the list would have come up with on their own.”

In addition, people indicate that one of the greatest values is the rich interaction offered by the community: “If it just becomes a platform for Q&A and no discussion I would lose interest quickly. No single persons answer should be taken as the only way and a discussion highlights the variations and flaws to a solution or even a problem. It’s like in any social circle. You hang around those who you like to interact with. The interaction being the important part. If the interaction ceases, there is nothing to keep you there.” Not only is interaction important, but so is the exposure to a variety of viewpoints and experiences from around the world: “The main reason I use these newsgroups is because I find them an invaluable medium with which I can collaborate with technical professionals throughout the world. Such a meeting of minds could never occur physically. If I have a specific problem, chances are there is someone out there who has already had the problem and has already solved it.” This ability to access and interact with colleagues is highly valued when people are geographically isolated, or do not have access to other members of the practice at their location: “As a Software Engineer working in a Forest Research Institute in a

remote corner of the world, the newsgroups give me a unique opportunity to be in contact with my professional colleagues.”

In addition, people indicate that they participate in the community due to moral obligation resulting in pro-social and altruistic behaviors. These people note that they are willing to help others at their own expense, or because it is part of being a member in the community. For some members, willingness to help others seems to be a matter of ‘been there, done that’, or the belief that it would have been nice for them to have had some help at some point in the past. Comments in this category also reflect that people exchange their knowledge with others because they feel helping others ‘is the right thing to do.’ As this comment demonstrates, some people feel that sharing knowledge to help others not only feels good (an intangible return), but that everyone is better off when knowledge is shared: “It feels good to answer questions that are easy for me, because of experience, but are stumbers for beginners. The world is a better place when such questions are answered, and someone can make progress.” People note that if they receive help from the community (or draw from the public good), then it is only fair to help others (contribute to the public good). One person notes: “I consider almost a fee paying group — you get an answer for giving an answer. This isn’t a rule or anything, but I try to go by that guideline.”

Finally, people are willing to help others because they are interested in maintaining the community or profession as a whole. For these people, participating in the community is a good way to set standards, and spread ideas throughout the profession due to the extra-organizational and global nature of these communities. One person notes that they contribute knowledge to “...advance the cause of object-oriented programming so that the field is a productive place to work where people understand my concerns and technical goals.” Another example is offered by this person who states “I feel that the exchange of knowledge is a good thing and should be communicated across people where possible. If as a group we share info then the knowledge base for the group goes up.”

5.4. Barriers to community

Not only did people provide comments on why they help others and participate, but they also took the opportunity to vent their frustrations with their communities. People commented on why they sometimes do not help other people. One apparent reason indicates that people do not participate if they are not comfortable with their level of expertise: “I don’t think I have the skill set to help others and prefer to browse and occasionally ask questions.” In addition, it seems that even when people have the knowledge to help others, they do not always choose to do so. Some people seem to hold the attitude that they only help those people who first try to help themselves. This reflects the idea that people contribute knowledge to help each other when problems arise, rather than to do someone else’s work for them. For instance, members in these communities are apparently accustomed to seeing questions from university students: “I will only provide comments and help to those who have read the manuals and are still stuck. If I think that it is a student wanting someone to do their homework — I will not help.”

Interestingly, many of the reasons for not wanting to participate in electronic communities are very similar to reasons found in face-to-face groups. For example, even in electronic exchange, dealing with big egos can disrupt exchange: “A lot of people seem to

go onto the newsgroups, with some technical knowledge, just to look at people's answers to better them, ie: 'ah, that's correct, but this is better'. It bores me senseless, it's the one-upmanship that you see in everyday community." In addition, since knowledge is such an important component of self-efficacy and personal self-image, attacks on people's ideas destroys participation. This person had a rather bad experience: "The insights that I gained from participating in that newsgroup were that there are many egotistical and intellectually arrogant people who behave as though any erroneous beliefs about the C programming language are a direct threat to their personal being. I do not wish to communicate with these people and therefore have no use for the newsgroup."

Besides the difficulties of dealing with egos and perceived 'personal attacks', there seems to be a size constraint. When communities become very large, participants appear to have difficulty culling the valuable information that pertains to their needs from the balance of the messages: "In a popular newsgroup, such as comp. lang C++, useful information and informed opinion tends to be highly diluted by novices and people who doesn't really understand that their messages are read by something like 100,000 people. Selecting useful information from the mass of postings is very hard for someone new." Finally, people also noted that participation in the community is very time consuming: "I now work full time and have a hard time keeping up with the volume of messages. I occasionally go to the newsgroup and see if there are any subjects of interest to me."

6. Discussion

The purpose of this research was to gain greater understanding of why people contribute to the provision of knowledge as a public good in electronic communities of practice. First, the comments support our argument that people in these communities are behaving pro-socially and out of a sense of moral duty. People in these communities feel that sharing knowledge and helping others is 'the right thing to do,' and people also have a desire to advance the community as a whole. However, giving back to the community in return for help was by far the most cited reason for why people participate. Unlike the direct reciprocity noted in social exchange theory (Blau, 1964), many of the comments reflect that people do not expect to receive future help from the same individual, but reciprocity in this context reflects generalized reciprocity. In 'generalized' exchanges, help given to one person is reciprocated by someone else and not by the original recipient of the help (Ekeh, 1974). This finding supports the work of Kollock (1999), who also suggests that when people help others due to the possibility of future reciprocation, there must exist the expectation that interaction will be available in the future. Thus electronic communities should use technologies that keep track of the structure of the interaction, archive discussions in a searchable format, and display the identities of group members.

Our findings indicate that people participate in these communities because they want to participate in a 'community', and engage in the exchange of ideas and solutions. Members are not simply interested in a forum for questions and answers, but appreciate the on-line dialog, debate and discussion around topics of interest. People feel that the community provides access to knowledge rather than just information, and becomes a valuable forum to receive feedback on ideas and solutions. The exchange character of the

discussion creates a ‘synergy’ effect that is often noted in face-to-face groups, where the end idea is better than the idea contributed by any one individual. Finally, these communities are especially critical for workers who do not have direct access to others in their practice.

People participate and help others because participation is fun, and helping others is enjoyable and brings satisfaction. This finding supports innovation research that notes communities emphasizing personal intrinsic rewards have higher levels of innovation (Judge et al., 1997). In addition, it appears that participants in these communities seek, respect, and learn from the experience of others. Electronic communities allow workers access to ideas and solutions that are not locally available, and our findings suggest that people are willing to use existing knowledge rather than ‘reinvent the wheel.’ Previous research on knowledge sharing has demonstrated that knowledge transfer is ‘sticky’, and even when people are willing to share, sometimes the recipient may not be interested due to the ‘not invented here’ syndrome (Szulanski, 1996). Comments from our participants suggest that knowledge flows best when seekers and experts are considered members of the same community and thus share the same values, codes, and narratives (Boland and Tenkasi, 1995; Brown and Duguid, 1991; Nahapiet and Ghoshal, 1998).

People participate in the communities in order to keep abreast of current ideas and innovations. Community success depends on making knowledge available that is useful, timely, and helpful to the community. This supports the findings of Jarvenpaa and Staples (2000) that information usefulness is strongly associated with use of collaborative media. Findings also indicate that people participate specifically to exchange knowledge, rather than to create social relationships. However, if the group becomes too large, or if the knowledge being exchanged is not relevant, people are disinclined to participate because it becomes too difficult to separate the wheat from the chaff. Also, our findings suggest that these communities are open to ‘free-riders’ seeking answers to specific questions, but members who act out of self-interest by exploiting the community to show-off expertise, or put down other members, have a negative impact on other member’s willingness to participate. Thus participation motivated by self-interest could potentially destroy the public good.

6.1. Implications for organizations

The findings from this study suggest that organizations should rethink basing their knowledge management strategies on knowledge markets and extrinsic reward systems. Systems based on extrinsic rewards quickly turn moral obligation into acts of self-interest, and could potentially destroy the open provision of knowledge in a community. Organizations concerned with increasing knowledge exchange should consider using KMS that connect members to open-membership electronic communities of practice. However, the greatest difficulty to developing these communities is convincing members that knowledge should be treated and valued as a public good rather than a private good. This means that organizations should establish a cultural norm that encourages people to participate and share knowledge in the community, and organizations can foster participation by acknowledging the reputation and status of organizational members actively engaged in their electronic community.

Engagement in these communities should not be limited to experts. As more members participate, the burden of helping others is lessened for any one individual. In addition, most direct benefits may flow to less experienced members seeking advice; therefore novices and hobbyists should also be encouraged to engage in the community. Organizations can also encourage members to give back to the community by establishing a community norm of generalized reciprocity. If members do not have the requisite expertise to give advice to others, these members should be encouraged to thank and recognize those members who provided help.

There is a tendency for organizations to view talking as ‘socializing’ and detracting from work. Our results suggest the opposite. If workers are given the resources to connect to a community of practice, the forum of ‘talking’ is work, and the end result is increased knowledge flows and innovation within the community. However, participation in the communities can be time consuming. Therefore, slack time may be necessary to ensure that people (especially time-starved experts) participate in the work of the community.

7. Conclusions

The knowledge management practices and systems being developed and used in organizations to support knowledge exchange are based on the assumption that knowledge is a private good that is exchanged in the expectation of a commensurable return. Based on the advantages of collaboration technologies that connect groups of people, we propose that organizations should also consider developing electronic communities of practice and manage knowledge as a public good. Our findings suggest that successful communities have members that act out of community interest rather than self-interest, and that self-interest denigrates the value of the community. In addition, we find that people who participate in electronic communities have a strong desire to engage in intellectual exchange with a community of practice, and do not use the technology to make friends or socialize. Finally, we find that people in these communities enjoy helping others and consider sharing the right thing to do. When knowledge is managed as a public good, people feel that they have a moral obligation to share, and this moral obligation supercedes the desire to maximize self-interest: “This is simply what one *does*. How can the world improve, unless we improve it”?

References

- Araujo, L., 1998. Knowing and learning as networking. *Management Learning* 29 (3), 317–336.
- Blau, P.M., 1964. *Exchange and Power in Social Life*. Wiley, New York.
- Boland Jr, R.J., Tenkasi, R.V., 1995. Perspective making and perspective taking in communities of knowing. *Organization Science* 6 (4), 350–372.
- Brown, J.S., Duguid, P., 1991. Organizational learning and communities-of-practice: toward a unified view of working, learning, and innovation. *Organization Science* 2 (1), 40–57.
- Ciborra, C.U., Patriota, G., 1998. Groupware and teamwork in R&D: limits to learning and innovation. *R&D Management* 28 (1), 1–10.
- Conner, K., Prahalad, C.K., 1996. A resource-based theory of the firm: knowledge versus opportunism. *Organization Science* 7 (5), 477–501.

- Constant, D., Kiesler, S., Sproull, L., 1994. What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research* 5 (4), 400–422.
- Davenport, T.H., Prusak, L., 1998. *Working Knowledge*. Harvard Business School Press, Boston.
- Deci, E.L., 1971. Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology* 18, 105–115.
- Deci, E.L., 1972. Intrinsic motivation, extrinsic reinforcement, and inequity. *Journal of Personality and Social Psychology* 22, 113–120.
- Dern, D., 1999. Unset — still useful after all these years. *BYTE*, 5th April.
- Ekeh, P.P., 1974. *Social Exchange Theory: The Two Traditions*. Harvard University Press, Cambridge, MA.
- Etzioni, A., 1988. *The Moral Dimension*. Free Press, London.
- Fukuyama, F., 1995. *Trust: The Social Virtues and the Creation of Prosperity*. Free Press, New York.
- Grant, R.M., 1996a. A knowledge-based theory of inter-firm collaboration. *Organization Science* 7, 375–387.
- Grant, R.M., 1996b. Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17, 109–122.
- Hansen, M.T., Nohria, N., Tierney, T., 1999. What's your strategy for managing knowledge. *Harvard Business Review* 77 (2), 106–116.
- Holsthouse, D., 1998. Knowledge research issues. *California Management Review* 40 (3), 277–280.
- Holsti, O., 1969. *Content Analysis for the Social Sciences and Humanities*. Addison-Wesley, Reading, MA.
- Jarvenpaa, S., Staples, D.S., 2000. The use of collaborative electronic media for information sharing: an exploratory study of determinants. *Journal of Strategic Information Systems*.
- Judge, W.Q., Fryxell, G.E., Dooley, R.S., 1997. The new task of R&D management: Creating goal-directed communities for innovation. *California Management Review* 39 (3), 72–85.
- Kogut, B., Zander, U., 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science* 3 (3), 383–397.
- Kohn, A.S., 1993. Why incentive plans cannot work. *Harvard Business Review* 71, 54–63.
- Kollock, P., 1999. The economies of on-line cooperation: gifts, and public goods in cyberspace. In: Smith, M.A., Kollock, P. (Eds.), *Communities in Cyberspace*. Routledge, London, 220–239.
- Kollock, P., Smith, M.A., 1996. Managing the virtual commons: cooperation and conflict in computer communities. In: Herring, S. (Ed.), *Computer-Mediated Communication: Linguistic, Social and Cross Cultural Perspectives*. John Benjamins, Amsterdam, pp. 109–128.
- Komorita, S.S., Parks, C.D., 1992. Reciprocity and the induction of cooperation in social dilemmas. *Journal of Personality and Social Psychology* 62, 607–617.
- Krippendorff, K., 1980. *Content Analysis: An Introduction to its Methodology*. Sage, Beverly Hill, CA.
- Lave, J., 1988. *Cognition in Practice*. Cambridge University Press, Cambridge, UK.
- Lave, J., 1991. Situating learning in communities of practice. In: Resnick, L.B., Levine, J.M., Teasley, S.D. (Eds.), *Perspectives on Socially Shared Cognition*. American Psychological Association, Washington, DC.
- Lave, J., Wenger, E., 1991. *Situated Learning*. Cambridge University Press, Cambridge, UK.
- Libeskind, J.P., 1996. Knowledge, strategy, and the theory of the firm. *Strategic Management Journal* 17, 93–108.
- McDermott, R., 1999. Why information technology inspired but cannot deliver knowledge management. *California Management Review* 41 (4), 103–117.
- Miller, D., Shamsie, J., 1996. The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of Management Journal* 39 (3), 519–543.
- Nahapiet, J., Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review* 23 (2), 242–266.
- Nanda, A., 1996. Resources, capabilities and competencies. In: Moingeon, B., Edmondson, A. (Eds.), *Organizational Learning and Competitive Advantage*. Sage, Thousand Oaks, CA, pp. 93–120.
- Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organization Science* 5 (1), 14–35.
- O'Reilly, C., 1982. Variations in decision maker's use of information sources: the impact of quality and accessibility of information. *Academy of Management Journal* 25 (4), 756–771.
- Orlikowski, W.J., 1996. Learning from notes: organizational issues in groupware implementation. In: Kling, R. (Ed.), *Computerization and Controversy*. Academic Press, New York, 173–189.
- Orr, J., 1996. *Talking About Machines: An Ethnography of a Modern Job*. ILR Press, Ithaca, NY.
- Penrose, E.T., 1959. *The Theory of the Growth of the Firm*. 5th ed. Basil Blackwell, Oxford.
- Pillutla, M.M., Chen, X.-P., 1999. Social norms and cooperation in social dilemmas: The effects of context and feedback. *Organizational Behavior and Human Decision Processes* 78 (2), 80–103.

- Polanyi, M., 1962. *Personal Knowledge: Towards a Post-Critical Philosophy*. Harper & Row, New York.
- Schultze, U., 1999. Investigating the contradictions in knowledge management. In: Larsen, T.J., Levine, L., deGross, J.I. (Eds.), *Information Systems: Current Issues and Future Changes*. IFIP, Laxenberg, pp. 155–174.
- Schwartz, S.H., 1970. Moral decision making and behavior. In: Macauley, J., Berkowitz, L. (Eds.), *Altruism and Helping Behavior*. Academic Press, New York, pp. 127–141.
- Simon, H.A., 1991. Bounded rationality and organizational learning. *Organization Science* 2, 125–134.
- Spender, J., 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal* 17, 45–62 (special issue).
- Sproull, L., Faraj, S., 1995. Atheism, sex and databases: the net as a social technology. In: Keller, B.K.J. (Ed.), *Public Access to the Internet*. MIT Press, Cambridge, MA, 62–81.
- Starbuck, W.H., 1992. Learning by knowledge intensive firms. *Journal of Management Studies* 29 (6), 713–740.
- Szulanski, G., 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal* 17, 27–44 (special issue).
- Townsley, B., 1993. Foucault, power/knowledge, and its relevance to human resource management. *Academy of Management Review* 18 (1993), 518–545.
- von Krogh, G., 1998. Care in knowledge creation. *California Management Review* 40 (3), 133–153.
- Walsh, J.P., Ungson, G.R., 1991. Organizational memory. *Academy of Management Review* 16 (1), 57–91.
- Wenger, E., 1998. *Communities of Practice*. Cambridge University Press, Cambridge, UK.
- Winter, S. (Ed.), 1987. *Knowledge and Competence as Strategic Assets*. Ballinger, Cambridge, MA.

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