



Journal of Knowledge Management

Knowledge sharing community in P2P network: a study of motivational perspective

James S.H. KwokS. Gao

Article information:

To cite this document:

James S.H. KwokS. Gao, (2004), "Knowledge sharing community in P2P network: a study of motivational perspective", Journal of Knowledge Management, Vol. 8 Iss 1 pp. 94 - 102

Permanent link to this document:

<http://dx.doi.org/10.1108/13673270410523934>

Downloaded on: 31 January 2016, At: 14:15 (PT)

References: this document contains references to 28 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 2744 times since 2006*

Users who downloaded this article also downloaded:

Alexander Ardichvili, Vaughn Page, Tim Wentling, (2003), "Motivation and barriers to participation in virtual knowledge-sharing communities of practice", Journal of Knowledge Management, Vol. 7 Iss 1 pp. 64-77 <http://dx.doi.org/10.1108/13673270310463626>

Zahra Tohidinia, Mohammad Mosakhani, (2010), "Knowledge sharing behaviour and its predictors", Industrial Management & Data Systems, Vol. 110 Iss 4 pp. 611-631 <http://dx.doi.org/10.1108/02635571011039052>

Alice Lam, Jean-Paul Lambermont-Ford, (2010), "Knowledge sharing in organisational contexts: a motivation-based perspective", Journal of Knowledge Management, Vol. 14 Iss 1 pp. 51-66 <http://dx.doi.org/10.1108/13673271011015561>

Access to this document was granted through an Emerald subscription provided by emerald-srm:305060 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Knowledge sharing community in P2P network: a study of motivational perspective

James S.H. Kwok and S. Gao



James S.H. Kwok is an Assistant Professor (jkwok@ust.hk), and S. Gao is a Ph.D Student (gaosheng@ust.hk), both in the Department of Information & Systems Management, Hong Kong University of Science & Technology, Kowloon, Hong Kong.



Abstract How to effectively share knowledge within organizations has been given a great deal of attention in practice as well as in research. However, most of current approaches are based on the centralized network structure, e.g. a central knowledge repository, which has been considered inappropriate and ineffective to facilitate the process of knowledge sharing. On the contrary, in this study, we propose the idea of a virtual knowledge sharing community that is based on decentralized P2P technology. In the community, each member plays an equal role of knowledge producing, receiving and coordinating. We believe that decentralized P2P has many distinct advantages in knowledge sharing. Moreover, referring to relevant psychological studies on human motivation, four application features for the virtual knowledge sharing community are further proposed. After being applied, each of the features is believed to have capability of motivating the members of community to share knowledge with each other.

Keywords Motivation (psychology), Information networks

Introduction

Research as well as the application of knowledge sharing has greatly increased over the last few years. Many international firms have made a substantial effort trying to create, transfer and share knowledge within organizations to enhance their profit generation capability (Laurie, 2002). It has been observed that application of knowledge sharing is often performed on a centralized approach, in which a central knowledge server or a common knowledge repository is used. However, the centralized knowledge management systems have been shown to be ineffective to share knowledge (Markus, 2001; Fahey and Prusak, 1998). Extensive rework on the centralized knowledge repository is needed, as its content is found to be error prone and inaccurate. It does not encourage organization members to use it. One possible reason could be that the tacit part of knowledge crucial to effective knowledge transfer process is missing (Grover and Davenport, 2001) and hence knowledge coordinators in the centralized system lack the contextual knowledge to re-purposing the repository content.

A potential solution to these problems could be to conduct knowledge sharing in a decentralized network supported by peer-to-peer (P2P) technology, in which interactive usage of both explicit and tacit knowledge between knowledge users can happen. The decentralized environment for knowledge sharing in this setting can be defined as knowledge sharing community. In such virtual community setting, every worker is not only a knowledge recipient, but also a knowledge producer as well as a knowledge coordinator. It ensures the integrity of the knowledge to be accessed, since the original knowledge owner is directly involved in the

“ In a virtual community setting, every worker is not only a knowledge recipient, but also a knowledge producer as well as knowledge coordinator. ”

knowledge reuse process. Another distinct advantage of decentralized knowledge sharing system is its enhancement of load balancing so that the workload of a dedicated group of knowledge producers can be dramatically reduced (Parameswaran *et al.*, 2001). In such a P2P-based community, interpersonal trust and an organizational culture that values knowledge sharing can be built and established. The motivations to contribute to the knowledge base can also be naturally achieved through P2P supported virtual community (Ruppel and Harrington, 2001). In this study, we propose a P2P network structure for the knowledge sharing community and identify four application features that are feasibly implemented into such P2P community setting in order to motivate the members of community to share knowledge with each other.

Literature background

Knowledge repository

A knowledge repository, also known as organization memory, is often a source of problems in centralized knowledge sharing system. To build up the repository rapidly, companies only include factual or procedural knowledge which is mainly explicit in nature. The tacit knowledge in connection between individuals and other artifacts that determine patterned interaction and behavioral regularities are ignored (Lant and Montgomery, 1987). Even after the designated knowledge coordinators included the context meaning in the repository on the base of their judgment, accuracy of interpretation may be questionable. The knowledge may be modified and revised with personal opinions and experiences by the repository coordinator. Under this context, knowledge users may encounter difficulties in interpreting as well as verifying the knowledge. If insufficient contextual details were not included with the knowledge, it may cause ineffective usage as result, especially for risk aversion users (Alavi and Leidner, 2001). This problem becomes more acute when the knowledge practitioners are new to the working domain, or have little experience or personal connection with the organization.

Virtual community

Knowledge management is a social activity requiring voluntary involvement of individuals with a strong commitment (Ichijo *et al.*, 1998). Virtual communities can be viewed as socially motivated communities that share common values and interests through electronic media to communicate, independent of time and place within a shared semantic space, where webs of personal relationships are formed (Rheingold, 1993; Schubert and Ginsburg, 1999). By mapping the realm of knowledge management and virtual community together, the preliminary knowledge sharing community is formed. It has been suggested that a person is motivated to contribute to knowledge if one will subsequently receive useful help in return, increasing of reputation and status through contribution (Kanter, 1995; Kollock, 1999). Interpersonal factors, especially liking and affiliation, also play an important role in motivating contribution of knowledge. The voluntary involvement of organizational members can be easily promoted when they share same visions and goals with sense of efficacy and attachment. The setting of the virtual community embraces the necessary motivational factors that create a suitable environment for knowledge sharing community development. People with the same work interest will organize together and form networks to allow flowing of knowledge. Interpersonal trust can be built within such network. They are the key components to be managed as noted in the knowledge management literature (Brown and Duguid, 1991; Heumer *et al.*, 1998; Krackhardt and Hanson, 1996).

Knowledge market and free rider problem

Although a virtual community setting is suitable for the knowledge sharing community, some predicaments do exist. Knowledge is not solely a piece of information; it can be regarded as a

product with value. It provides a competitive edge towards peoples' works and achievements (Krogh, 1998). Because of the value, individuals will recognize knowledge as their own properties. They need to receive something in exchange (Grover and Davenport, 2001; Davenport and Prusak, 1998). Knowledge in sharing community, however, can be regarded as public goods. It is to some degree indivisible and one person's consumption does not reduce the amount available to others. It is difficult or impossible to exclude individuals from benefiting from the goods (Kollock, 1999). Even the producer disagrees on sharing the goods, every member of the community, regardless of whether or not they have contributed, benefits. Its content is indivisible and can be replicated limitlessly with basically zero marginal cost. Members of the community have full access to the collective content or resources – free riding is not punished. It is basically the individual's choice whether to contribute to the community or to shirk and free ride on others' contribution. Whether a community should provide public goods and tolerate free riding behavior presents a social dilemma, and may lead to a serious business risk in the knowledge sharing community. Shirking occurs in virtual communities such as *Napster* and *Gnutella*, although in both examples system performance has apparently not deteriorated to a degree that would make the service unattractive despite massive free riding (Adar and Huberman, 2000). The authors of this paper propose imposing the market mechanism with the support of intellectual property rights in the community to improve the free rider problem. It facilitates the trading of knowledge products as well as providing a solid foundation for market competition. Proper institutional governance such as guidelines to enforce intellectual property rights should also be implemented to boost up market mechanism.

Proposed P2P network structure

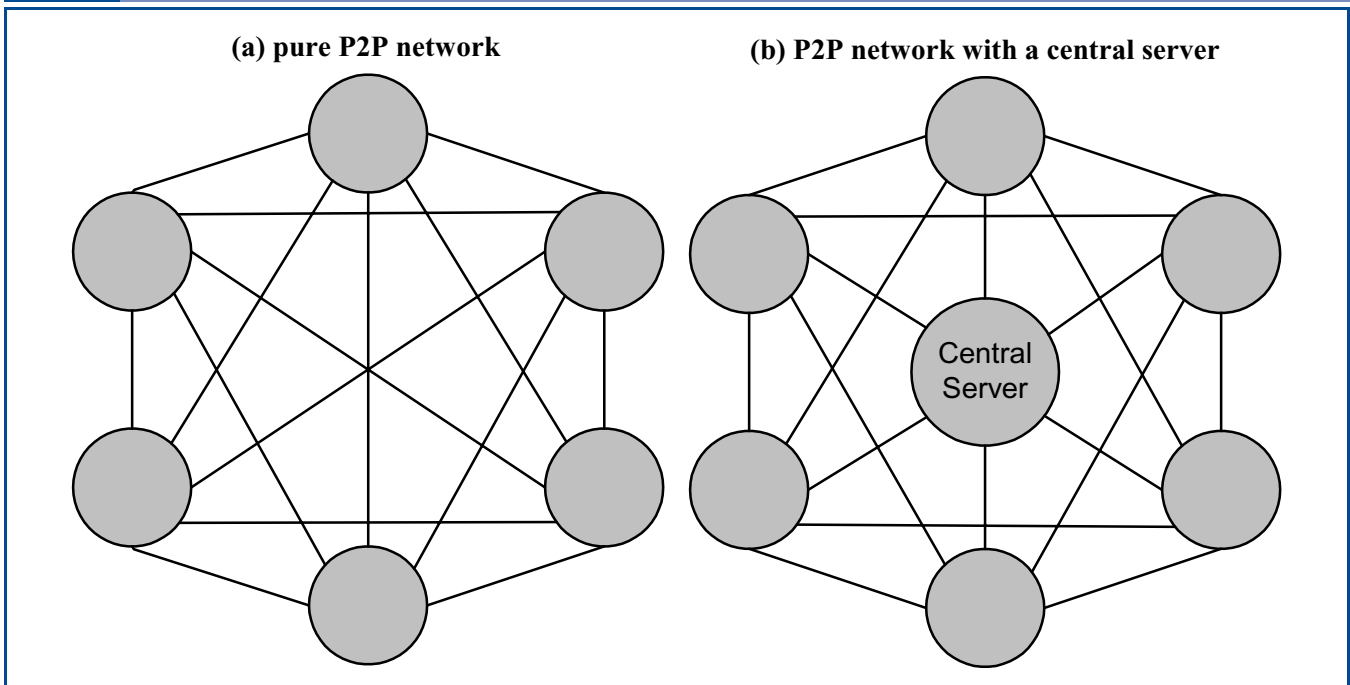
We propose a P2P network structure supported by enhanced P2P technology to fit our virtual knowledge sharing community. P2P network first appeared in the advanced research projects agency network (ARPANET) architecture in 1969. The ARPANET originally connected four universities and enabled scientists to share information and resources across sites. Typical P2P applications include *Napster*, *Gnutella* and ICQ client programs, which focus on file and knowledge sharing. The pure P2P sharing network is basically an information directory while explicit knowledge is maintained on clients' computers. A P2P network user may connect to any user on the network by specifying the Internet protocol (IP) address of his computer or identity (ID) of the user – a direct connection is established. This connection enables file sharing and video conferencing as well as audio communications. Usually, the P2P network is a decentralized network (see Figure 1a) in which each client is equipped with a local repository. A central server (Figure 1b) is sometimes also deployed within the decentralized network so as to arrange high network traffic flow and allow a developer to add necessary infrastructure and provide special features for knowledge sharing community to fit the requirement of community members. When the P2P network is utilized to share knowledge it forms a knowledge-sharing environment with multiple knowledge repositories. The distinct advantages of using multiple knowledge repositories in knowledge sharing include:

- (1) knowledge can be produced in many different formats for different users by different knowledge producers at different functional levels;
- (2) the role of knowledge generation and codification are conducted by the same knowledge worker, contextual information is naturally embedded; and
- (3) time required for knowledge generation and sharing process is minimized, as the layer of knowledge coordinator is removed.

The knowledge is more readily available to users within the network. The proposed system can ensure the knowledge is dynamic and up-to-date rather than static, which is critical to the success of any knowledge management system (Alavi and Leidner, 2001). It can also improve existing IT-based KM, which is currently incapable of keeping pace with dynamic needs of knowledge creation (Malhotra, 1999).

In a P2P network, a virtual face-to-face communication system can be realized among video- and/or audio-enabled P2P clients. This attribute may refer to the sharing of tacit knowledge, which is conceptually and technically different from tacit knowledge sharing in the centralized

Figure 1 P2P network structure



approach. It closes the gap between knowledge producers and knowledge recipients, and encourages real-time interactions between them visually and verbally for sharing the knowledge whenever it is necessary. Further elaborations on the manual, advice from past experiences, and suggestions from skilful operators, etc. are obtainable through such interaction process. The exchange process in this decentralized network becomes highly interactive. Alternatively, when a knowledge user wants to explore different views on the same subject, the user has many options to choose from either switching to the other member's repository or interacting directly. This fundamentally changes the sharing of knowledge and makes the P2P approach more useful to workers, especially when they are new to the working domain.

The technology of P2P network also resolves the knowledge authorship problem, which is highly related to the time spent on the verification during knowledge sharing process. The P2P clients usually come with an authorship system. Users are labeled with identities and their contributions are marked with these labels. Knowledge users are free to select their trustful resources when many related knowledge resources are returned from the knowledge sharing system. As a result, members in the community will have substantial information for evaluation before utilizing this piece of knowledge.

Motivational factors in P2P knowledge sharing community

Motivating users to become involved in a virtual community has been studied in various academic disciplines and can be viewed from a sociological, economic, or technological perspective (Hummel and Lechner, 2001). In the present study, we draw on psychology literature to examine what may drive users in a P2P network to share knowledge within their communities. On the basis of psychological theories, we try to summarize and clarify the most salient motivational factors that may influence the willingness or tendency of P2P network users to share knowledge. The purpose of doing so is that we could then add some new application features to P2P community to put particular focus on these motivational factors, in order to facilitate knowledge-sharing process from the psychological perspective of users.

In the motivational area, specifically, Deci's work (Deci, 1975; Kollock, 1999) emphasized the distinction between internal and external psychological factors to explain human behavior within communal settings, where the former is referring to "intrinsic motivation" and the latter to

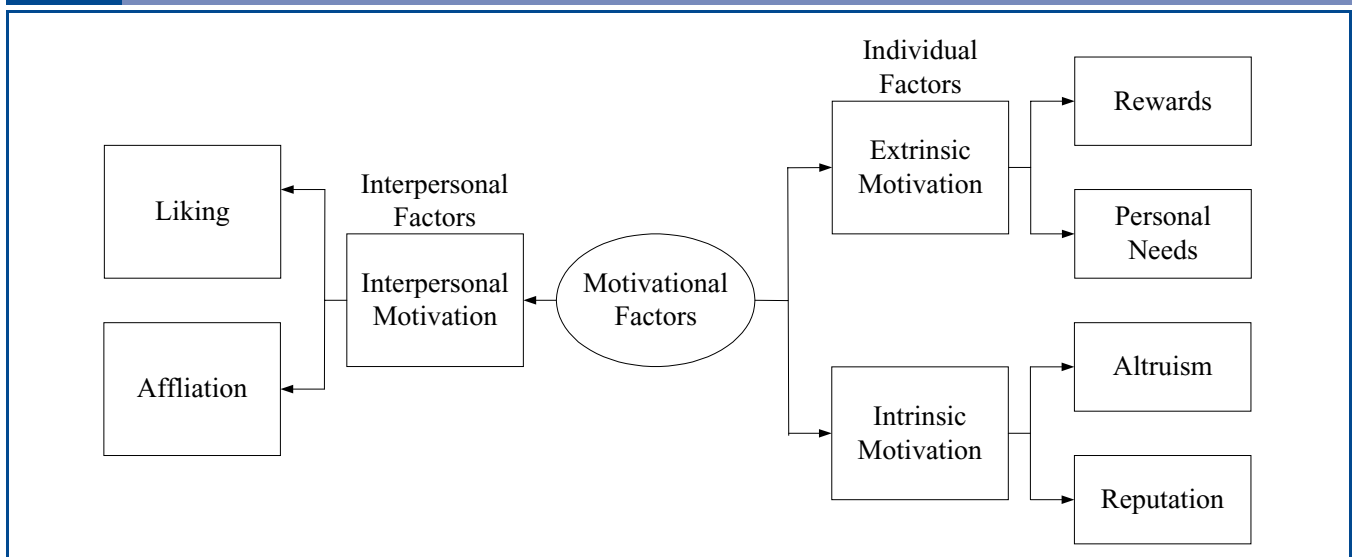
“external rewards”. Intrinsic motivation includes the desire for achieving competence and self-determination. External rewards include factors such as direct or indirect monetary compensation. Moreover, Kollock (1999) suggests that there are four possible reasons why a person is motivated to contribute valuable information or resources to a group. They are:

- (1) the expectation that one will subsequently receive useful help in return;
- (2) the increasing of one’s own reputation and status in the group through contributing;
- (3) a sense of efficacy; and
- (4) the feeling of belonging to the group.

Constant *et al.* (1994) discussed information sharing based on social exchange theory. According to them, information sharing is affected by rational self-interest as well as social and organizational contexts. They conclude that organizational culture and policies as well as personal factors can influence people’s information sharing attitude and behavior. The more the person believes that information sharing is a social norm, that is, the usual, correct, and a socially expected behavior, the more they will be willing to share. This in fact fits well with grassroots Internet ethics that permeates many virtual communities ranging from *Usenet* newsgroups to *Napster* and *SETI*. Besides social values, sharing behavior also depends on technical factors. That is, the easier P2P-based content sharing systems can be used, the more people will actually share. In other words, complicated user interfaces or difficult to use systems may negatively affect user’s sharing behavior.

We organize the factors that motivate contribution to P2P communities in Figure 2, which serves us as an explanatory framework for the participatory behavior of peers in P2P networks. The motivational factors that determine the participation level of P2P community members are classified into individual factors and interpersonal factors. Individual factors are divided into extrinsic and intrinsic motivation. Extrinsic motivation can be generated through rewards or derived from personal needs. A reward is a compensation for the contribution to the community. Personal need means that the contribution one provides will benefit or be useful to oneself in some indirect way. For example, making a contribution may increase self-esteem. Intrinsic motivation relates to altruism and reputation. Altruism is the behavior of someone that, although not beneficial or perhaps even harmful to oneself, benefits others (Hoffman, 1981). Reputation refers to the overall quality or character as seen or judged by the community, or the recognition of some specific contribution to the community by other peers. Apart from these individual factors, interpersonal factors, especially liking and affiliation, also play an important

Figure 2 Motivational factors in P2P communities





role in motivating P2P contribution. Liking is an affection based on admiration, benevolence, or common interests while affiliation refers to value derived from the connection to the group.

Application features in P2P knowledge sharing community

After laying out a motivational foundation for participatory behavior in electronic communities in the previous section, we now propose a number of software application features that aim to implement incentive mechanisms to stimulate productive knowledge sharing in P2P service environments. Obviously, a wide range of possibilities could be considered, but for our present discussion we have chosen four basic types that best address the motivational factors discussed in our framework above. These application features are:

- (1) contribution-reward mechanism;
- (2) individual identity and profile generation;
- (3) sub-community organization; and
- (4) reviews and peer recommendation.

Contribution-reward mechanism

Reward is one of the extrinsic motivations to induce contribution. It is very common to use a reward as an incentive to motivate Internet community participants to contribute to the group. Reward can be tangible or intangible. Examples of tangible rewards can be monetary rewards, discount rates for subscription or purchase, bonus points for prize remedy and add-value service. Monetary rewards are common incentives used in Internet community, e.g. spedia.com (Janis, 2001) who pays users who connect to the Internet and view the Spedia's advertisement bar while surfing the Web. Intangible rewards include self-benefit or indirect benefits from the contribution and top contributors ranking. This ranking feature can be important to someone who believes that contributions could get one better reputation from others. An example of this feature can be found at Amazon.com (Reviewer, 2002) that has a top reviewer chat that encourages customers to write reviews for books. The 10 top reviewers in terms of the number of reviews that they have posted will be shown in the chat with small icons to indicate their achievement and contribution to the site.

In order to integrate the reward features into the P2P knowledge sharing community, we propose to add a knowledge-tracking module in the application. Conceptually, the function of the module is to monitor the level of knowledge contribution and retrieval of each member in the P2P community. Rewards are given to the members in proportion to the extent to which they are involved with the community in terms of the amount of knowledge they contribute to or retrieve from their knowledge sharing community. To be more specific, the amount of the reward could be proportional to the number of questions or responses posted in the community, the frequency to communicate with other community members, or the number of useful files uploaded or downloaded.

Individual identity and profile generation

Some file-sharing software, like Gnutella and Freenet (Freenet, 2003), conduct file transfer or offer downloads in an anonymous way. A user who downloads the digital file from the network cannot identify where the source of the file is hosted and who offers the file. In some cases, the IP addresses of the hosting computers may be identified. However, this IP address can be meaningless if it is dynamically allocated by Internet service provider.

The individual identity feature provides the fundamental element to building trusted relationships among members (Reviewer, 2002), and can then induce effective knowledge sharing between them. Thus, an identification system that can identify the individual member who participates knowledge sharing activities is needed when the reward and the participation ranking feature is integrated into the P2P community as well. Any form of members' participation to knowledge sharing within the community, for example, can be identified through their respective ID or the e-mail address.

In combining the identification system with P2P knowledge sharing community, basic personal information including interests about a member can be maintained in the member profile. By

referring to the interpersonal psychology of an individual, we know that people tend to form affiliations with others who have similar interests. Therefore, the member profile is not only useful for targeted marketing, but also useful for members within the community to know each other and interact with members who have common interests.

Sub-community building

The sub-community feature facilitates community members to organize their own sub-communities within the P2P knowledge sharing community. In other words, a community can be composed of many sub communities that are owned by particular members. In the real-world environment, it is common that people form a community made up of people with similar interests, for example, fan clubs of singers, movie stars, football teams, basketball teams, but also professional special interest groups. Information and knowledge exchange are major activities in these communities. Some people seek to increase the welfare of others, which is actually a reflection of altruism, one of our individual intrinsic motivational factors (Hoffman, 1981). The formation of a sub-community can provide community identity and a sense of belonging for an individual, which can also induce another type of altruistic behavior – “kin selection altruism” due to liking and love. They may treat other members of the sub-community as their kin and thus be willing to do something beneficial to others but not necessarily to themselves. Therefore, it is believed that, within a sub community of knowledge sharing, the member will probably be more willing to contribute knowledge for others or receive it for their own use.

Peer recommendation

The peer recommendation feature is a useful tool to identify members in the P2P community who provide quality services. Peer recommendations can be constructed based on peer evaluations, reviews and ratings. A member can rate another member based on the experience of previous service. It is also a tool to assist in identifying trustworthy members in the community. An example of a peer recommendation system in use is the user reputation system in ebay.com (ebay.com, 2003). Users can provide feedback and comments to other users. Each user will have their own feedback profile page that shows all feedback and comments from others.

By applying peer recommendations in P2P knowledge sharing community, community members can rate each other in terms of different criteria. For example, they can rate a member according to the quality or the quantity of knowledge this member contributes to the community. This provides not only relevant information to other members but also a self-reference to ones who give out the recommendations. This can be used as records for themselves and used as a decision tool to help decide with which member to interact and to further share knowledge on the basis of the previous experience.

Summary

We propose four feasible application features with which to motivate the members of P2P community to share knowledge with each other. Each of the features enables the motivational function on knowledge sharing behavior of P2P community members by realizing the motivational factors we addressed previously in this study. Every feature may emphasize a different range of motivational foundation. The general relationships between the particular features and their underlying motivational foundation are shown in Table I, where a “+” indicates a positive correlation between specific motivational factors and P2P application features. Of course, when applied to a particular domain, these relationships may need to be redefined.

Conclusion

In this study, we first propose a decentralized P2P network structure for knowledge sharing community as an idea contrary to the traditional central knowledge repository as the sharing media. In this P2P knowledge sharing community, every member is relatively independent and has an individual knowledge repository. Information and knowledge can be communicated and shared through electronic channel, e.g. Internet, within the community. It is believed that this



Table I The relationship between application features and motivational factors

Application features	Motivational factors					
	Reward	Personal needs	Altruism	Reputation	Liking	Affiliation
Contribution reward mechanism	+			+		
Individual identity and profile generation	+	+	+	+	+	+
Sub-community building		+	+	+	+	+
Peer recommendations	+	+		+		

structure is able to keep knowledge of community update and dynamic as well as improve the efficiency of sharing process. Additionally, we organize a framework that contains multiple facets of human motivational issue. By referring to this framework, we then propose four application features for the P2P knowledge sharing community. These features are technically feasible and believed to be able to motivate community members to participate and involve knowledge-sharing activities in terms of knowledge retrieval and contribution. On the basis of present study, future research is promising on: explicitly examining the potential of P2P network to improving the effectiveness of knowledge sharing; and comparing the effect of four features proposed on motivating members to share knowledge.

Acknowledgment

This research is supported in part by the Hong Kong Research Grants Council through a Teaching Development Grant (HKUST-1-F).

References

- Adar, E. and Huberman, B.A. (2000), "Free riding on Gnutella", *First Monday*, Vol. 10 No. 2.
- Alavi, M. and Leidner, D.E. (2001), "Review: Knowledge management and knowledge management systems: conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 No. 1, pp. 107-36.
- Brown, J.S. and Duguid, P. (1991), "Organizational learning and communities of practice: toward a unified view of working, learning, and innovation", *Organization Science*, Vol. 2 No. 1, pp. 40-57.
- Constant, D., Kiesler, S. and Sproull, L. (1994), "What's mine is ours, or is it? A study of attitude about information sharing", *Information Systems Research*, Vol. 5 No. 4, pp. 400-22.
- Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What they Know*, Harvard Business Press, Boston, MA.
- Deci, E. (1975), *Intrinsic Motivation*, Plenum Press, New York, NY.
- ebay.com (2003), "eBay – the world's online marketplace", available at: www.ebay.com, accessed 4 July 2003.
- Fahey, L. and Prusak, L. (1998), "The eleven deadliest sins of knowledge management", *California Management Review*, Vol. 40 No. 3, pp. 265-76.
- Freenet (2003), "The free network project", available at: <http://freenetproject.org>, accessed 4 July 2003.
- Grover, V. and Davenport, T.H. (2001), "General perspectives on knowledge management: fostering a research agenda", *Journal of Management Information Systems*, Vol. 18 No. 1, pp. 5-21.
- Heumer, L., Krogh, G. and Roos, J. (1998), "Knowledge and the concept of trust", in Kleine, D. (Ed.), *Knowing in Firms: Understanding, Managing and Measuring Knowledge*, Sage, London.
- Hoffman, M.L. (1981), "Is altruism part of human nature", *Journal of Personality and Social Psychology*, Vol. 40 No. 1, pp. 121-37.
- Hummel, J. and Lechner, U. (2001), "The community model of content management: a case study of the music industry", *Journal of Media Management*, Vol. 3 No. 1, pp. 4-14.

- Ichijo, K., Krogh, G. and Nonaka, I. (1998), "Knowledge enablers", in Kleine, D. (Ed.), *Knowing in Firms: Understanding, Managing and Measuring Knowledge*, Sage, London.
- Janis, M. (2001), "Spedia unveils surt+tech", *Adweek*, Vol. 42 No. 9, pp. 55.
- Kanter, R.M. (1995), "Managing the human side of change", in Rubin, I.M. (Ed.), *The Organizational Behavior Reader*, Prentice Hall, Englewood Cliffs, NJ.
- Kollock, P. (Ed.) (1999), "The economies of online cooperation: gifts and publics goods in cyberspace", *Communities in Cyberspace*, Routledge, London.
- Krackhardt, D. and Hanson, J.R. (1996), "Informal networks: the company", in Prusak, L. (Ed.), *Knowledge In Organizations*, Butterworth-Heinemann, Newton, MA.
- Lant, T.K. and Montgomery, D.B. (1987), "Learning from strategic success and failure", *Journal of Business Research*, Vol. 15 No. 6, pp. 503-18.
- Laurie, D.L. (2002), "Productivity challenge: gaining through innovation", *Financial Executive*, Vol. 18 No. 7, pp. 30-5.
- Malhotra, Y. (1999), *Beyond Hi-tech Hidebound Knowledge Management: Strategic information Systems for the New World of Business*, BRINT Research Institute.
- Markus, M.L. (2001), "Toward a theory of knowledge reuse: types of knowledge reuse situations and factors in reuse success", *Journal of Management Information Systems*, Vol. 18 No. 1, pp. 57-93.
- Parameswaran, M., Susarla, A. and Whinston, A.B. (2001), "P2P networking: an information sharing alternative", *Computer*, Vol. 34 No. 7, pp. 31-8.
- Reviewer, A. (2002), "Reviewer FAQ", available at: www.amazon.com/exec/obidos/subst/sommunity/reviewer-say.html/107-0207598-3267744#features, accessed 1 April 2002.
- Rheingold, H. (1993), *The Virtual Community: Homesteading on the Electronic Frontier*, Addison-Wesley, New York, NY.
- Ruppel, C.P. and Harrington, S.J. (2001), "Sharing knowledge through Intranets: a study of organizational culture and Intranet implementation", *IEEE Transactions on Professional Communication*, Vol. 44 No. 1, pp. 37-52.
- Schubert, P. and Ginsburg, M. (1999), "Virtual communities of transaction: the role of personalization in electronic commerce", *Electronic Markets*, Vol. 10 No. 1, pp. 45-55.
- von Krogh, G. (1998), "Care in knowledge creation", *California Management Review*, Vol. 40 No. 3, pp. 133-53.

This article has been cited by:

1. Salim Chujfi, Christoph Meinel. 2015. Patterns to explore cognitive preferences and potential collective intelligence empathy for processing knowledge in virtual settings. *Journal of Interaction Science* 3. . [\[CrossRef\]](#)
2. John Israilidis, Evangelia Siachou, Louise Cooke, Russell Lock. 2015. Individual variables with an impact on knowledge sharing: the critical role of employees' ignorance. *Journal of Knowledge Management* 19:6, 1109-1123. [\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)
3. I-Fan Liu, Shelley S.-C. Young. 2015. An exploration of participative motivations in a community-based online English extensive reading contest with respect to gender difference. *Interactive Learning Environments* 1-14. [\[CrossRef\]](#)
4. Yun Zhao, Huayou Si, Qing Lang. 2014. Knowledge Sharing in Virtual Community Based on RDF Triple Publication and Retrieving To Process SPQRQL Query. *Journal of Software* 9. . [\[CrossRef\]](#)
5. Saad Abdullah, Haryani Haron Knowledge Sharing System Model for Higher Learning Institutions: Case Study 97-102. [\[CrossRef\]](#)
6. Mehpare Tokay Argan, Metin Argan, Alper Ozer, Huseyin Kose. 2013. A Study of Motivational Factors Associated With Peer-to-Peer (P2P) File-Sharing. *Procedia - Social and Behavioral Sciences* 99, 180-188. [\[CrossRef\]](#)
7. Li-An Ho, Tsung-Hsien Kuo. 2013. How system quality and incentive affect knowledge sharing. *Industrial Management & Data Systems* 113:7, 1048-1063. [\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)
8. Praveen Jeenger, Ravi Kant. 2013. Understanding the Knowledge Sharing Barriers in Organisation: A Fuzzy AHP Approach. *Journal of Information & Knowledge Management* 12, 1350003. [\[CrossRef\]](#)
9. Taha Havakhor, Rajiv Sabherwal Knowledge Sharing in Peer-to-Peer Online Communities: The Effects of Recommendation Agents and Community Characteristics 3553-3562. [\[CrossRef\]](#)
10. Woohyun Shim, Luca Allodi, Fabio Massacci Crime Pays If You Are Just an Average Hacker 62-68. [\[CrossRef\]](#)
11. Wei Li. 2011. Factors Impacting Cross-Cultural Knowledge Sharing Through Online Systems in Organisational Settings. *Journal of Information & Knowledge Management* 10, 351-363. [\[CrossRef\]](#)
12. Saokosal Oum, DongWook Han. 2011. An empirical study of the determinants of the intention to participate in user-created contents (UCC) services. *Expert Systems with Applications* 38, 15110-15121. [\[CrossRef\]](#)
13. Jie Yu, Zhenhui Jiang, Hock Chuan Chan. 2011. The Influence of Sociotechnological Mechanisms on Individual Motivation toward Knowledge Contribution in Problem-Solving Virtual Communities. *IEEE Transactions on Professional Communication* 54, 152-167. [\[CrossRef\]](#)
14. Keng Siau, John Erickson, Fiona Fui-Hoon Nah. 2010. Effects of National Culture on Types of Knowledge Sharing in Virtual Communities. *IEEE Transactions on Professional Communication* 53, 278-292. [\[CrossRef\]](#)
15. Jie Xue, Zhengang Zhang Research on the Relationship between Knowledge Management Infrastructure, Knowledge Sharing and Knowledge Management Performance 1-4. [\[CrossRef\]](#)
16. Michele Swift, David B. Balkin, Sharon F. Matusik. 2010. Goal orientations and the motivation to share knowledge. *Journal of Knowledge Management* 14:3, 378-393. [\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)
17. Yu-Hui Fang, Chao-Min Chiu. 2010. In justice we trust: Exploring knowledge-sharing continuance intentions in virtual communities of practice. *Computers in Human Behavior* 26, 235-246. [\[CrossRef\]](#)
18. Xi Zhang, Zhenjiao Chen, Doug Vogel, Minghui Yuan, Chuanjie Guo. 2010. Knowledge-sharing reward dynamics in knowledge management systems: Game theory-based empirical validation. *Human Factors and Ergonomics in Manufacturing & Service Industries* 20:10.1002/hfm.v20:2, 103-122. [\[CrossRef\]](#)
19. Wei Li. 2010. Virtual knowledge sharing in a cross-cultural context. *Journal of Knowledge Management* 14:1, 38-50. [\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)
20. Jari Soini, Petri Linna, Jari Leppaniemi, Hannu Jaakkola Toward collaborative situational awareness in a time-critical operational environment 266-270. [\[CrossRef\]](#)
21. Timon C. Du. 2009. Building an automatic e-tendering system on the Semantic Web. *Decision Support Systems* 47, 13-21. [\[CrossRef\]](#)
22. Fu-ren Lin, Jen-Hung Yu. 2009. Visualized cognitive knowledge map integration for P2P networks. *Decision Support Systems* 46, 774-785. [\[CrossRef\]](#)
23. Encouraging Knowledge Sharing in Global Virtual Teams: The Interaction Effect of Individual Difference and Perceived Sharing Benefits 1-10. [\[CrossRef\]](#)

24. Zhihong Li, Minxia Li, Jun LiAn Empirical Research on the Influencing Factors of Knowledge Sharing Willingness among Virtual Community Members 1-4. [[CrossRef](#)]
25. Jari SoiniManaging information and distributing knowledge in a knowledge-intensive business environment 889-894. [[CrossRef](#)]
26. Chen-Ya Wang, Hsin-Yi Yang, Seng-cho T. Chou. 2008. Using peer-to-peer technology for knowledge sharing in communities of practices. *Decision Support Systems* 45, 528-540. [[CrossRef](#)]
27. Sulin Ba, Karl R. Lang, Andrew B. Whinston. 2008. Compositional enterprise modeling and decision support. *Information Systems and e-Business Management* 6, 137-160. [[CrossRef](#)]
28. Radhika Rajagopalan, Runa SarkarA digital ecosystem approach to using ICT for sustainable development in communities 413-418. [[CrossRef](#)]
29. Radhika Rajagopalan, Runa SarkarInformation and communication technology , communities and social capital — how the Digital Ecosystem approach can work 419-425. [[CrossRef](#)]
30. Radhika Rajagopalan, Runa SarkarDigital Networks and Sustainability: Do We Need the Government? 49-54. [[CrossRef](#)]
31. Ming Chen, Jianming Zhou, Linwei ZhaoThe Effect of Virtual Community Culture and Group Cohesion on Knowledge Sharing: A Case Study of Professional Virtual Community 105-108. [[CrossRef](#)]
32. Halil Zaim, Ekrem Tatoglu, Selim Zaim. 2007. Performance of knowledge management practices: a causal analysis. *Journal of Knowledge Management* 11:6, 54-67. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
33. Li Zhi-hong, Zhan Pei-xuan, He Ji-leStrategy of Establishing Enterprise Standard System Based on SECI Model 772-777. [[CrossRef](#)]
34. Jari Soini, Timo Makinen, Vesa TenhunenManaging and Processing Knowledge Sharing between Software Organizations: A Case Study 1108-1113. [[CrossRef](#)]
35. D.J. Edwards, J. Yang, B.C. Wright, P.E.D. Love. 2007. Establishing the link between plant operator performance and personal motivation. *Journal of Engineering, Design and Technology* 5:2, 173-187. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
36. Leyland M. Lucas. 2005. The impact of trust and reputation on the transfer of best practices. *Journal of Knowledge Management* 9:4, 87-101. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
37. Philip Haynes. 2005. New Development: The Demystification of Knowledge Management for Public Services. *Public Money and Management* 25:10.1111/pmam.2005.25.issue-2, 131-135. [[CrossRef](#)]
38. Shyamala C. SivakumarE-Learning for Knowledge Dissemination 249-262. [[CrossRef](#)]