

Redefining Social Network Services: A Solution to Personal Information and Knowledge Management

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Abstract

Instead of aiming at the augmentation of human communication abilities as other social software does, social network services (SNS) provide better chances for people to enhance their abilities to handle interpersonal relationships, by deriving their theoretical foundation from social network theory. However, they are far from working perfectly as reflected by the defects in the networks – distrust, fragmentation, and duplication. This paper addresses such problems innovatively in the context of personal information and knowledge management (PIKM), which involves a series of activities in our daily life and work that can be well supported by restructured SNS. While our future efforts target an operable SNS system as the solution to PIKM, our research at current stage gives full consideration to the identified problems, and achieves an initial system model with four primary modules: Personal Profile, Collaboration Workspace, Knowledge Network of Practice, and Platform.

1. Introduction

The past five years has witnessed that the social nature of the Internet becomes more and more visible and appealing. social network services (SNS), the social media that concerns meeting people, establishing connections, and maintaining the relationships, have ascended to the most visited websites in 2006 [1]. Earlier studies on SNS constructed a strong base for understanding and implementing the essential social networks and virtual communities by probing into such issues as identity, reputation, and trust [2] [3] [4]. Despite the continuing addition of new features like video sharing, mobile-device-based networking, etc., certain fundamental problems challenging the viability of SNS remain unsolved, or somehow neglected.

Network-related distrust, fragmentation, and duplication are the three major ones we discern and summarize from existing findings and our observations [5], as detailed in Section 2. When confronting these obstacles, we take a different path, seeking new opportunities in a fresh context – personal information and knowledge management (PIKM). Our interpretation of PIKM and argument for applying SNS to PIKM will

be provided in Section 3 and 4 respectively, followed by Section 5 illustrating a PIKM-oriented model of SNS in elementary design.

2. SNS: an overview

SNS, also known as social networking sites, belong to social software that enables people to gather, connect or collaborate [6]. While other social software, including the widely used instant messaging, Internet forums, and the increasingly popular Weblogs and Wikis, may also breeds social networks as the byproduct of computer-mediated communication, only SNS particularly concentrate on the building and verifying of online social networks.

According to social network theory, a social network is a structure containing a set of social objects (people or groups of people) and a mapping or description of relationships between them [7]. The focus on the patterns of relationships, rather than the attributes of objects, distinguishes social network theory from traditional sociological studies. Hence, we can detect in social network how resources flow from one social object to another [8].

In SNS, people's links to others, integrated into their self-descriptive profiles, have been made visible to the authorized parties, and they are sometimes easily accessible thanks to the introduction of visualization technologies [9]. The immediate benefit of the publicity of once private social circles is that more new connections can be more easily and confidently created through the existing ones [10].

Concomitant of the convenience of establishing relationships, however, is the decreasing relationship quality or even value of the entire social network. People's reasons of adding a "friend" vary: to include a real-world acquaintance, to include a person of interest met online, to respond to a friendship invitation out of courtesy, or just to make their friend lists look remarkable, so on and so forth [3]. Moreover, the pair at both ends of one connection may not understand it in the same way. One of the biggest problems with current online social networks, as a result, consists in their inability to ensure trust.

Second to distrust, fragmentation of networks also frustrates users. Human life has multiple facets, such as

work, date, travel, etc. From the SNS' point of view, choosing only one of them will be propitious to market positioning. But for users, this means that they have to meet their colleagues on one site and traveling partners on another. Managing separate accounts can be rather burdensome, and different interfaces may lead to ineffective usability as a whole.

A third deficiency of the networks, duplication, should not be ignored. The most updated SNS list [11] collects hundreds of entries falling into more than 30 categories. Under certain categories, competition is intense – tens of SNS serve the same purpose with some differences in functionality and interface design. To experience the novelties, users have to rebuild their personal networks in new SNS, and it may take a while for an entire network to migrate. Sometimes users need maintain the networks in the older ones to avoid losing a “friend” who is not willing to switch service.

3. Personal information and knowledge management

A brief review of SNS above reminds us of the problems behind the blossom of SNS. Before we discuss them in the context of PIKM, it is necessary to clarify the fundamentals of PIKM, especially the disappearance of a clear boundary between personal information management and personal knowledge management.

Personal information may be understood as information about an individual, or that owned by an individual and under his/her direct control. Here we adopt the second understanding. Therefore, emails, contacts, to-do lists, and bookmarks are the typical examples of personal information. The interpretation of personal knowledge seems more complex. Most of our knowledge resides in our minds, with a small portion externalized through words, drawings, photographs, etc., which are tacit and explicit knowledge respectively. While the latter is almost ready to retrieve, organize, communicate and use like information, the former stays unarticulated, either because the owner is unable or unwilling to do so [12].

Personal information and knowledge are always considered to constitute individual intellectual capital and bonded as a package for everyday use to complete tasks (work-related or not) and fulfill a person's various roles (friend, employee, member of community, etc.). Knowledge provides general guidance at a higher and abstract level, and information evidence that is recognizable and closer to current situations. A case in point is scientific research. Any valid conclusion is based on the sum of experiment data (information), references (explicit knowledge), and researchers' personal education, experience, viewpoints, etc. (tacit knowledge).

Accessing, evaluating, organizing, analyzing, conveying, collaborating with, and securing information and knowledge are the seven principles in the framework of PIKM, usually believed to happen one by one [13].

The fact, however, is that PIKM can begin with any of them because people always come with existing knowledge and information processed to various degrees.

4. SNS: from “hooking up” to PIKM

The most powerful word connecting SNS to PIKM is “relationship”. Social network, the essence of SNS, is about all kinds of relationships between people, as mentioned above. Since the people themselves are not the key in social network research, we may simplify each person to the intellectual capital he or she possesses, i.e. information and knowledge. In this way, social network has been transformed into “knowledge network” where the relationship is the channel of flow of information and knowledge. If social network displays “who knows who”, then knowledge network displays “who knows what” [14].

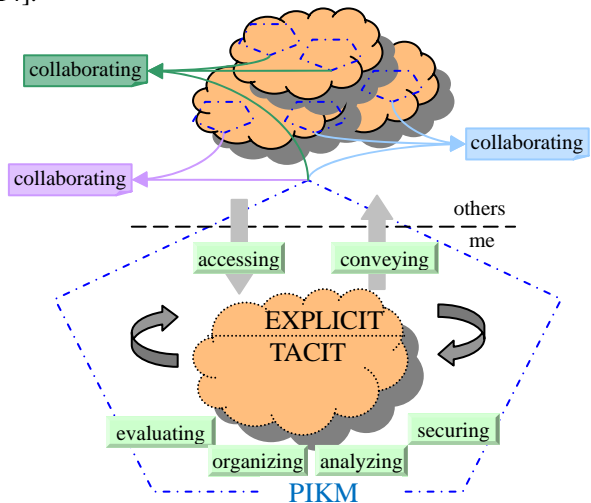


Figure 1. PIKM framework with seven principles

When it comes to PIKM, this sort of knowledge network is the infrastructure. To make this point clearer, we need refer to the seven principles of PIKM, which are repositioned in our framework of PIKM in Figure 1. When evaluating, organizing, analyzing, and securing their own knowledge and information, people mainly work on themselves. This private cloud explains the inter-transformation of explicit and tacit knowledge. The public cloud, accessing to others' explicit information and knowledge and conveying our own to others, is responsible for the flow of intellectual resources. Both clouds have been enclosed into a pentagon to represent a PIKM unit. Finally, collaborating is interwoven with all the other principles. A PIKM unit may participate in more than one collaborating event at one time, and the events require each involved unit to frequently alternate one cloud with the other for shared purposes.

Presented in Figure 1, if seen globally, is actually a network of PIKM units connected through collaborating events. It has been agreed that relationship is the central facet of the collaborative process, and generating and

growing intellectual capital value “is about skill in cultivating relationships” [15]. Thus the collaborating aspect of PIKM naturally leads us back to SNS, the expert of networking. For the sake of PIKM, SNS will not only build relationships, but also build desirable ones. Superior to real-life social introduction, SNS are able to reach a considerably large user group for absence of geographical or temporal limitations and connect two dissimilar people in terms of location, affiliation and so on, which means the possibility of establishing weak relationships. As far as knowledge sharing is concerned, weak ties are more beneficial for absorbing new information and ideas from the outsiders [16].

Indeed, this is just one side of the win-win result. On the other side, the issue of trust in current SNS is likely to be alleviated because people are no longer communicating for the sake of socializing. Collaboration for various purposes provides a practical and substantial environment in which people stand a better chance of entering each other’s life and work, and take their relationships more seriously.

Based on the discussion so far, we can safely conclude that SNS are part of the solution to better and more useful PIKM. However, further research is still needed in order to answer to all the principles of PIKM as well as overcome the major problems of SNS.

5. An initial model of PIKM-oriented SNS

In this section, we will present an initial model of PIKM-oriented SNS. It consists of four major components: *Collaboration Workspace Module*, *Personal Profile Module*, *Knowledge Network of Practice*, and *Platform Module*, which are integrated to achieve smooth combination of PIKM and SNS.

The *Collaboration Workspace Module* brings together two typical human collaborating scenarios – personal and professional collaborations (see Figure 2). Collaboration here means that two or more subjects, individuals, groups or institutions, etc., make collective efforts for the same objective. People may focus on building and strengthening a particular kind of relationships in collaboration. More specifically, they cultivate friendship and seek emotional support through social interaction in personal collaboration, whereas in professional setting, they gain more precise awareness of others’ information, knowledge, and expertise that are useful for task completion or intellectual support. Our motivation of incorporating them in one module is to ease the transformation of different relationships in that information and social connections outside of professional working are important connections between colleagues in formal environment, making them human and approachable [17]. Taking the established trust from one kind of relationship to the other is obviously a feasible and effective approach to lessen distrust in today’s social network. A workspace, simply speaking, is

where collaboration takes place. Workspaces are created by the collaboration sponsor to accommodate the collaborators, store related resources, and provide the necessary tools such as emails, calendars, messaging, and so forth. Under each category, personal or professional, workspaces can be different in size and length of life circle.

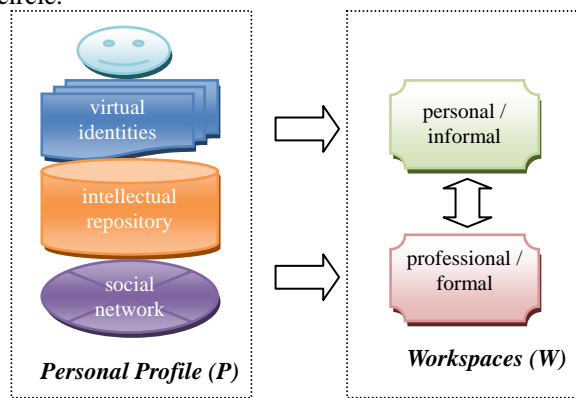


Figure 2. Personal Profile module and Workspace module

While the *Personal Profile Module* is ubiquitous, it requires more flexibility in our model on account of the concurrence of distinct workspaces. In Figure 2, users will have more than one virtual identity under a single account, to a great extent solving the problem of fragmentation. It is common sense that human are taking multiple roles in their daily life but nobody can see all these roles except themselves. Likewise, SNS users may use a specific identity in a certain workspace or a certain kind of workspaces, and this identity only covers the most relevant user background information, excluding all the personal hobbies in the identity for a very formal workspace, for instance. Aside from identities, this module contains an intellectual repository for storing users’ personal information and knowledge or the pointers to such resources. When collaborating, users may specify what should enter the workspace repository for sharing so that other collaborators could access the resources anywhere at any time.

The *Knowledge Network of Practice*, in fact, is a linked map of hundreds of thousands of profiles (P) with workspaces (W) as the links (Figure 3). Since the profiles contain knowledge and information and the workspaces management activities, such network is no longer knowledge network, but “knowledge network of practice” instead. The link between any two profiles actually is the sum of all their shared workspaces, thus an arbitrary link in the network may carry single, double, or multiple values implied by the thickness of the lines, clearly grading the relationships. This is a picture of the whole, but an individual user is only able to view what is connected to him or her. For example, the colorized part indicates P₄’s knowledge network of practice, conveying much richer information than the social network that appears in today’s SNS.

Lastly, the *Platform Module* is less about design, and more about environment and tools. As a matter of fact, SNS are never short of tools; search engine, email, blogging, social tagging, and forum, just to name a few. But the variety of tools directly gives birth to the aforementioned problem of network duplication. On the one hand, tools are not provided in a systematic manner within a particular system. On the other hand, any close system can hardly provide all the needed tools. People are dependent on a wide range of systems containing special-purpose tools simultaneously. At present, we tackle this problem retroactively, identifying a set of tools aiming at each of the principles of PIKM and integrate them onto the platform. The limited space in Figure 3 shows only some of the most frequently used ones. Ideally, the system will prepare the default tool kits for personal and professional workspaces respectively, but users are free to modify the kit according to their needs and the availability of tools. They may even share with other users their customized workspaces with special tool choices, for example, wedding planning workspace, doctor-patient workspace, research cooperation workspace, etc. Or when users are choosing tools for similar workspaces, the system may make personalized recommendations.

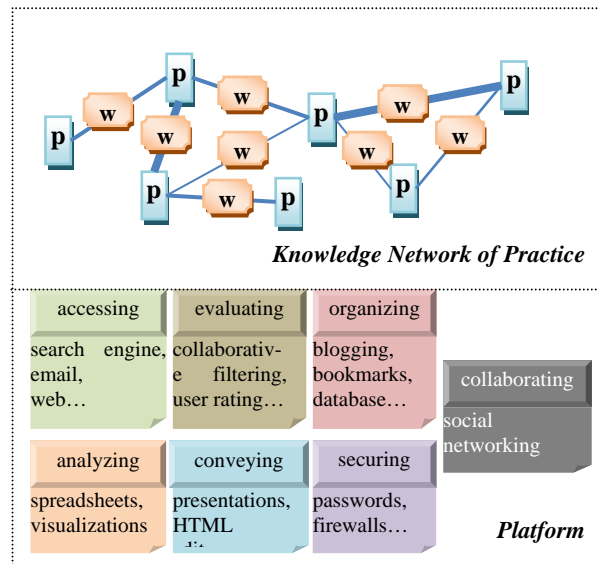


Figure 3. Knowledge Network of Practice and Platform module

6. Conclusions and future work

People rely on SNS to be connected for various reasons in cyberspace. Our investigation into the area of PIKM reveals that it is desirable to transplant the networking power of SNS to the relationship-based collaboration in PIKM. In this theoretical paper, we redefine SNS with a PIKM-oriented model. And we have started the practical design and implementation of such model, the result of which will probably be evaluated and presented in the succeeding papers. During this process, one big difficulty lies in the actualization of the platform module. Even the

tool collection seems comprehensive at this moment, we should look forward to new ones that may be embedded in other systems. Proactive measures, such as establishing protocols for tool exchange between the systems, need to be taken.

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