Personal Knowledge Management by SocialWare – Challenges and Benefits

Martin Christof Kindsmüller

Institute for Multimedia & Interactive Systems
University of Lübeck
Ratzeburger Allee 160
D-23538 Lübeck
mck@imis.uni-luebeck.de

Abstract: This short reflection paper is addressing the challenges of using SocialWare for personal knowledge management (PKM). Starting point is a critical discussion of the constitutive terms and concepts of PKM and SocialWare. This paper argues for a clear distinction between data, information and knowledge and presents some lessons learned from following this distinction.

1 Introduction

Suppose you had to write an article about a topic you are not very familiar with. A common strategy is to ask some colleagues for help. You need information about some introductory material, pivotal reviews, conference proceedings, international experts in the field etc. A common approach is to ask several colleagues because not everybody knows about everything. Next you might have to check every answer if you trust it and how useful it is for your task. Technically speaking the task that has just been described includes information retrieval, information filtering and information evaluation – all of which is nowadays promised by SocialWare systems.

SocialWare is a term coined by Hattori et al. [Ha99] to denote collaborative online software systems that support social activities on the internet. Examples for social activities are (1) finding (matchmaking between) people with similar characteristics or interests within an online community, (2) mediating community context e.g. information on the way and participants of a certain discussion to prevent flame wars, and (3) detecting and displaying relationships between members of an online community. The goal of this contribution is to discuss the challenges and benefits of using SocialWare as a means for personal knowledge management (PKM).

2 Data, Information and Knowledge

To be able to discuss our understanding of PKM and to elaborate on the difficulties of using SocialWare for PKM, we start by arguing for a clear distinction between data, information and knowledge. This distinction helps to locate the point of application

where technical or human (i.e. social) assistance can support the information gathering process. As Figure 1 shows data is an entity whereas information and knowledge are relations [Ki00].

Information *I* is a relation between data *d* (e.g. stuff found on your hard disk or in a web document) and a world w: *I*(*d*,*w*) and knowledge *K* is a relation between information *I* and a subject *s*: *K*(*I*(*d*,*w*),*s*). This view upon data, information and knowledge yields some important consequences. For example, there is no information without reference to a real or thought (more precisely possible) world [Kr63] and knowledge only exists in regard to a subject that has this knowledge (i.e. this subject incorporates data in relation to a world). The structural view on data, information and knowledge shown in Figure 1 can be supplemented by a process view showing the subject as the actor who generates both relations. The first process – further on referred as *interpreting* – is the generation of the information relation *i*(*s*): *d*, *w* → *I*(*d*,*w*). The second process – further on referred as *representing* – is the generation of the knowledge relation *r*(*s*): *I*, *s* → *K*(*I*(*d*,*w*),*s*).

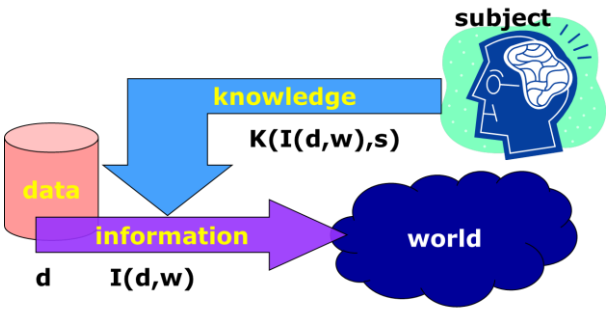

Figure 1: Structural view on data, information and knowledge

Taking these structural and process assumptions seriously has major consequences on (collaborative) information gathering. Strictly speaking one has to distinguish between data and information gathering. As a basic precondition for information gathering processes, one has to ensure that data is turned into information (i.e. that data is interpreted). This is usually done by humans. It can be done in two ways: either the users who interact with the retrieval system have to transform data into information themselves on the fly (synchronously), or the interpretation process is done by them or by other users in advance (asynchronously). Prior to emphasizing how this interpretation process can be supported by the help of others through the use of SocialWare systems, the concepts of SocialWare and online communities are presented.

3 SocialWare and Online Communities

SocialWare [Ha99] and Online Communities [Pr00] are not the same and neither of these terms should be closely related to the Web2.0 type of social networks like Facebook or MySpace. Both concepts go back to the era before one started to distinguish different versions of the Web (SocialWare) or even before the web existed at all (Online

Communities [Rh94]). The term SocialWare in the sense of Hattori et al. [Ha99] has a strong emphasize on the enabling software that makes online communities possible. Their main focus is on detecting and displaying relationships between community members using multi agent modelling and other advanced AI inference mechanisms. This goes far beyond the friendship concept and the "*n* amount of people liked this" used in social networks like Facebook or MySpace. The term Online Community on the other hand focuses on the psychological and sociological structures and processes of the community building and maintaining.

A basic prerequisite for a SocialWare system is the people forming the Online Community by populating the SocialWare. In accordance with [KMM09], we refer to Online Community as being a voluntary group of users who partake actively in a certain computer-mediated service. An online community consists of four basic constituents [Pr00]: (1) socially interacting people striving to satisfy their own needs, (2) a shared purpose like an interest or need that provides a reason to cooperate, (3) policies in the form of tacit assumptions, rituals, or rules that guide the community members' behaviour, (4) a technical system that works as a carrier that mediates social interaction. So how can SocialWare and Online Communities enhance PKM? What are the challenges and what are the benefits?

4 Personal Knowledge Management by SocialWare?

An important initial research question regarding the role of PKM by SocialWare is to determine if the concept has potential value i.e. is it a solution that can be successful? As addressed by [KMM09] online communities often have the problem that they never reach the critical mass of successful operation: "The concept seems interesting if enough people would join the community but everybody is waiting". One way of working around the critical mass problem is designing a "killer feature" [KMM09] into the application. A SocialWare has a "killer feature" if it generates immediate benefit for a single user as soon as he or she starts using the application, even without anybody else contributing. SocialWare for PKM is not unlikely to incorporate such a killer feature as can (e.g.) be seen with the social bookmarking service del.icio.us[1]: people start using it because it generated immediate benefit (bookmarks being tagged instead of hierarchically categorized and being accessible from different browsers on different computers and in different locations). So one hypothesis is that PKM can help SocialWare to reach a critical mass by offering a "killer feature".

However with regard to the "wisdom of the crowds phenomenon" [Su05] the opposite hypothesis (SocialWare can support PKM) can hold true as well. Surowiecki (referring to Francis Galton) states that under the "right circumstances" groups can be remarkably intelligent, even smarter than the smartest people in them. If one looks at the crucial factors that define the "right circumstances" (diversity of opinion, independence of information, decentralization of information, aggregation of information, group sets its

[1] http://delicious.com

own goal) it becomes obvious that well designed SocialWare systems are implementing them by construction.

Referring back to the discussion of data versus information and information versus knowledge in section 2 the pivotal complex of problems can be paraphrased as “how to turn data into information” and “how to turn information into knowledge”. If one applies the distinction made in section 2 to SocialWare data can only become information if it is related to the (or a possible) world. This can be done effective and along the way highly efficient by mediated data within an online community.

5 Lessons Learned from Trying PKM with SocialWare

This contribution closes with a list of best practices derived from the lessons learned in various SocialWare projects (e.g. [Rö04], [KKH08], [KK09]) over the last ten years:

- A large percentage of all the problems in SocialWare systems – especially with the communication and interaction tools – is a consequence of failing to distinguish between data, information and knowledge.
- Trust is the pivotal element, it will make a SocialWare run or fail and it will render the information useful or turn it into waste.
- Knowledge is always personal and therefore cannot be exchanged. SocialWare has to be designed in a way so that information about knowledge can be exchanged otherwise there will be only data exchanged
- There are no such things as collaborative knowledge or knowledge communities, so do not try to design for it. Try to design for a community that exchanges information that could turn into personal knowledge.
- The collaborative generation of personal knowledge works better if
    - the personal knowledge bases (the knowledge structures stored in human brains) of the community members are similar,
    - the trust among the community members is high,
    - the communicated information is unambiguous,
    - there is a well-defined relation between data and information within the community.
- Good PKM tools help to distinguish data, from information and knowledge:
    1. They support the search for information and the construction of personal knowledge.
    2. They help to determine the information entropy of data by relating a data element to the aggregated estimation of the community as well as the personal estimations of community members.

3. They act as an external reference of personal knowledge by providing cues to personal knowledge structures and by the annotation of personal information to data elements.
4. They help by providing ubiquitous access to 1. - 3.

References

[Ha99] Hattori, F.; Ohguro, T.; Yokoo, M.; Matsubara, S.; & Yoshida, S.: Socialware: Multiagent Systems for Supporting Network Communities. Communications of the ACM, 42(3), 55-61, 1999.

[KK09] Kindsmüller, M. C.; Krüger, J.: ImiCaToo: Ein leichtgewichtiges Werkzeug zur Terminkoordination von Ad-hoc-Gruppen und verteilten Teams. In S. Kain, D. Struve & H. Wandke, (Hrsg.): Workshop-Proceedings der Tagung Mensch & Computer 2009. Grenzenlos frei!?. Berlin: Logos Verlag, 217-224, 2009.

[KKH08] Krohn, T.; Kindsmüller, M. C.; Herczeg, M.: myPIM: A Graphical Information Management System for Web Resources. In Proceedings of the 3rd international Conference on Pragmatic Web, P. J. Ågerfalk, H. Delugach, & M. Lind, Eds. ICPW '08, vol. 363. ACM, New York, NY, 3-12, 2008.

[KMM09] Kindsmüller, M. C.; Melzer, A.; Mentler, T.: Online Communities and Online Community Building. In M. Khosrow-Pour (Ed.) Encyclopedia of Information Science and Technology, 2nd Edition. Hershey, PA: Information Science Publishing, 2899-2905, 2009.

[Ki00] Kindsmüller, M. C.: PeKMan – Personal Knowledge Management. How to turn data into information & how to manage knowledge about large data collections. In NETMELT – New Technologies in Media Education for Learning and Teaching in Europe, European Community, Socrates IP. Freie Universität Berlin, 2000.

[Kr63] Kripke, S.: Semantical analysis of modal logic. Zeitschrift für Mathematische Logik und Grundlagen der Mathematik, 9, 67-96, 1963.

[Pr00] Preece, J.: Online communities: Designing usability and supporting sociability. Chichester, UK: John Wiley & Sons, 2000.

[Rh94] Rheingold, H.: A slice of life in my virtual community. In L. M. Harasim (ed.), Global networks: Computers and international communication. Cambridge, MA: MIT Press, 57-80, 1994.

[Rö04] Röse, K.; Urbas, L.; Künzer, A.; Kindsmüller, M. C.; Leuchter, S.: Engineering of a Virtual Community Platform: Realization of a Socialware with Integration of the 'User as Editor' Concept. In C. Ghaoui (Ed.) E-Educational Applications: Human Factors and Innovative Approaches. Hershey, PA: Information Science Publishing, 1-27, 2004

[Su05] Surowiecki, J.: The Wisdom of Crowds. Random House, New York, 2005.