

# Social Knowledge Management Software Architecture

Master Thesis Subject

Version 1.4

Marcel Flipse  
1473379

[Marcel.flipse@gmail.com](mailto:Marcel.flipse@gmail.com)

VU University Amsterdam, The Netherlands  
Master student Information Sciences

Guidance:

Prof. Dr. J.C. van Vliet

VU University Amsterdam, The Netherlands  
Department of Information Management and  
Software Engineering

Keywords:

Knowledge Sharing, Software Architecture,  
Technology Acceptance & Social Media Tools

*This master project will focus on creating a social knowledge sharing environment inside a company where knowledge sharing is identified as vital. This environment will be created by using software architecture methods. During this project existing literature will be compared with implementations from the field.*

## Problem Description Company

Knowledge Management should be addressed within each company. When knowledge is scattered throughout an organization and not connected by a single environment, it can hurt the knowledge sharing ability of a company. For instance when knowledge about the same topic exists in multiple departments and these topics are not connected, knowledge about these topics can be incomplete or even conflicting. Furthermore it is possible that some knowledge may never be found because it is stored on a local not connected knowledge base of a specific department. When knowledge is shared between companies it becomes even more important to use a single knowledge management environment. In some situations access to specific knowledge is restricted. Access management itself and explaining why certain knowledge has restrictions can be done with more ease by using a single knowledge sharing environment. By developing certain knowledge categories like “concept” knowledge, “how-to”

knowledge and “event” knowledge, unnecessary access restrictions can be identified and be prevented.

By using a single knowledge sharing environment, it becomes feasible to include *social elements* in the form of a social network. Knowledge sharing has always contained social elements because it is about communicating knowledge from one individual to another individual that needs that knowledge. Current approaches where knowledge from experts is stored in knowledge bases provide a basic knowledge sharing environment. However extracting knowledge from a knowledge base can be less efficient than a conversation between the individual that needs the knowledge and the expert that possesses the knowledge. Enabling the creation of a social network that helps storing social connections, might even be more important for the knowledge sharing process. When an expert on a certain topic can be “followed” by an individual that is interested in such knowledge, this individual can easily be notified when the expert adds new information. Similar functionality can be found on “Facebook” and “Twitter”. When a social network is created, rating of knowledge and users by the community also becomes possible.

The proposed research should identify the elements of a social knowledge sharing management structure by using *Software Architecture* methods to identify important elements like stakeholder demands, basic functionality, basic structure, organizational issues, threats and opportunities. This approach makes use of the knowledge of the stakeholders and helps with acceptance of the to be developed environment.

## Problem Description University

The topic knowledge sharing is not so popular anymore, so there might be a gap between existing literature and practice. The proposed research will try to decrease the size of this gap by searching for implemented concepts from existing literature, updating existing theory and describing new practices. This can be done by developing a knowledge sharing management structure with help of Software Architecture methods. The current knowledge sharing methods and organizational structure of the company will be used as a starting point for this new software structure.

## Additional Research Topics

Literature suggests that individuals have specific roles like “knowledge gatekeeper” and “knowledge

transformer”. A knowledge gatekeeper collects or creates knowledge in a specific form while a knowledge transformer translates this knowledge so the knowledge can be understood by a specific audience. Are these roles used in practice and how should these roles be used in a social knowledge sharing management environment? Is there any overlap between these roles?

While collection and translation are addressed by current literature, a knowledge sharing model seems to be missing. Therefore a model for knowledge sharing is proposed (Figure 1) that has the constructs “collection”, “translation”, “storage” and “diffusion”. Collection is about searching for and acquiring new knowledge. Translation is about translating specific knowledge so it can be used by other departments than where the knowledge was created. Storage is about different ways of storing knowledge and adding information to the knowledge in order to enable the creation of system actions. When storing knowledge, topics like reliability, reusability and robustness should be addressed. When knowledge is false, incomplete or cannot be accessed it might as well not exist. Verifying reliability is a system action that is made possible by adding data to the knowledge. The last construct of knowledge sharing, knowledge diffusion, is about spreading the knowledge so individuals that need the knowledge know about the existence of the knowledge and are able to find the knowledge. Any findings during the proposed research may change or reject this model.

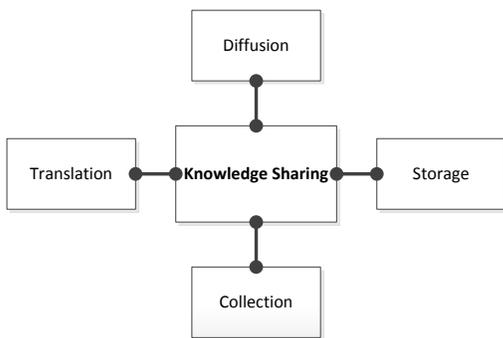


Figure 1: Knowledge sharing constructs

What will change when a single knowledge sharing environment will be implemented? Will some current tools like the “one on one” knowledge sharing processes or group presentations be replaced by online equivalents or will they still have a place in the new environment. Will the “sweet spot” for knowledge sharing change? Is this new environment usable by all individuals at a company or is there a group that will not be able to use this environment?

Answers for these questions can be found during the proposed research.

## Project Schedule Proposal

Week	Focus
1	Current environment
2	Current environment
3	1st Concept
4	1st Concept + Prep Extended Concept
5	Extended Concept Creation
6	Extended Concept Evaluation
7	Extended Concept Evaluation
8	Reserve Slot Internship Opportunities
9	Writing Final Thesis
10	Writing Final Thesis + Plan Project Closure
11	Writing Final Thesis + Plan Project Closure
12	Presentations and Evaluations

Table 1: Project schedule

This Master project will take 12 weeks (Table 1). The first two weeks will be used in order to get to know the current environment, extend current theory, identify key knowledge sharing routines and identify key stakeholders that can help with the creation of the structure of the knowledge sharing environment. During the second and third week a concept structure will be developed with the help of key stakeholders and additional stakeholders will be contacted in order to be prepared for the fifth week. During the fifth week a more complete concept structure will be created with help of the additional stakeholders and this new concept structure will also be discussed with the original stakeholders. During the sixth and seventh week the concept structure will be evaluated by at least one method, such as the Architecture Tradeoff Analysis Method and the concept will be updated accordingly. The eighth week is reserved as a buffer when internship opportunities arise during the earlier weeks. The final four weeks will be used to finalize the thesis and presentations.

## Deliverables

1) **Master Thesis**, that describes the project, goals of the research and scientific project results. 2) **Company Project Document**, that describes the project containing the same knowledge as the master thesis, but in a different business format. 3) **VU presentation**, that shares results with a scientific audience and finally, 4) **Company presentation**, that shares the results of the project with individuals from the company where the research was performed.

## ***Used literature***

Ardichvili A., Page V., Wentling T., 2003. *Motivation and barriers to participation in virtual knowledge-sharing communities of practice*. Journal of Knowledge Management, Vol. 7, No. 1, Pp. 64-77.

Dyer J. H., Nobeoka K., 2000. *Creating and Managing a High Performance Knowledge-Sharing Network: The Toyota Case*. Strategic Management Journal, Vol. 21, No. 3, Pp. 345-367.

Hansen M. T., 2002. *Knowledge Networks: Explaining Effective Knowledge Sharing in Multiunit Companies*. Organization Science, Vol. 13, No. 3, Pp. 232-248.

Harada T., 2003. Three steps in knowledge communication: the emergence of knowledge transformers. Research Policy, Vol. 32, Pp. 1737-1751.

Spencer J. W., 2003. *Firms' Knowledge-Sharing Strategies in the Global Innovation System: Empirical evidence from the flat panel display industry*. Strategic Management Journal, Vol. 24, Pp. 217-233.

Hendriks P., 1999. *Why Share Knowledge? The Influence Of ICT on the Motivation for Knowledge Sharing*. Knowledge and Process Management Vol. 6, No. 2, Pp. 91-100.

Marchetti A., Tesconi M., Ronzano F., 2007. *Semkey: A Semantic Collaborative Tagging System*. Workshop on Tagging and Metadata for Social Information Organization at WWW, Vol. 7 Pp. 8-12

McDermott R., O'Dell C., 2001. *Overcoming cultural barriers to sharing knowledge*. Journal of Knowledge Management, Vol. 5, No. 1, Pp. 76-85.

Morrison A., 2008 *Gatekeepers of Knowledge within Industrial Districts: Who They Are, How They Interact*. Regional Studies, Vol. 42, No. 6, Pp. 817-835.

Passant A., Laublet P., 2008. *Meaning Of A Tag: A collaborative approach to bridge the gap between tagging and linked Data*. Proceedings of the WWW 2008 Workshop Linked Data on the Web Beijing China.

Sarkas N., Das G., Koudas N., 2009. *Improved search for socially annotated data*. Proceedings of the VLDB Endowment 2, No. 1, Pp. 778-789.