

Culture-Awareness for Supporting Knowledge Maturing in Organizations

Athanasios Mazarakis, Christine Kunzmann, Andreas Schmidt,
Simone Braun

FZI Forschungszentrum Informatik, Karlsruhe

Abstract

The success and sustainability of informal learning support at the workplace largely depends on motivational, social, and cultural aspects of the involved individuals, teams, and organizations. In this paper, we present our empirical findings from a large-scale interview-based study on those aspects with respect to knowledge development in companies. We draw some conclusions that influence the development of future culturally aware systems for the enterprise and organizations.

1 Introduction

Motivational, social, and cultural aspects of the involved individuals, teams, and organizations are widely accepted factors for the success and sustainability of social software and informal learning, particularly at the workplace (Günther 2010), but also, e.g., in terms of contribution style in Wikipedia (Pfeil et al. 2006). Although this seems to have become common-sense, we can still observe that there are hardly any systematic approaches to analyse these aspects and to integrate the findings into concrete design activities (Kunzmann et al. 2009). This is particularly true for Enterprise 2.0 where the stakeholders and their relevant goals play a key role (Schachner & Tochtermann 2008).

Within the context of the European Integrating Project MATURE (<http://mature-ip.eu>), we have been investigating the development of collective knowledge in the enterprise context towards a shared goal (“knowledge maturing”), its characteristics in different phases, major barriers that limit the continuity of the development process, and technological solutions overcoming those barriers (Schmidt 2005). One major activity was a large-scale interview-based study with companies in various sectors.

In this paper, we want to present those parts of the study that relate to cultural aspects, and we derive from those findings major theses on how to move forward towards cultural awareness in system design for informal learning, collaboration, and knowledge management.

2 Large-scale Interview-based Study

To inform the development of the theoretical underpinnings as well as the technical developments, we have conducted an interview-based study focusing on different aspects of knowledge maturing (Kaschig et al. 2010). We asked the interviewees in particular about perceived barriers and knowledge maturing activities. The majority of interviewees were from European companies, but we also included interviewees outside Europe, e.g., in China, or Saudi-Arabia. Altogether 139 interviews in 15 different countries were conducted. We concentrated on organizations within the knowledge-intensive service sector, but also included a broad spectrum of organizations with respect to size, sector and knowledge intensity. We analysed the collected data with quantitative and qualitative methods.

2.1 Barriers in Knowledge Maturing

We asked the interviewees if and how the following barriers, which are based on a literature review (Fank & Katerkamp 2002), affected their organization:

- lack of time
- fear of loss of power
- lack of usability
- fear of embarrassment¹
- low awareness of the value and benefit
- no interest

The most prominent barrier (in the pre-defined six categories) mentioned by the interviewees was “lack of time” with 39.4% of the mentions, which is not surprising and can be interpreted as “*other things have higher priority*”. The second and third most frequently mentioned barriers were “low awareness of the value and benefit” and “lack of usability”. Interestingly the barrier “fear of embarrassment” was more prominent in the earlier phases of the maturing process.

¹ Originally called „fear of disgrace“ in the questionnaire but later changed to “fear of embarrassment” because this term catches the original meaning better and “fear of disgrace” was perceived as too strong. The original meaning was in German “Angst vor einer Blamage” [FK02].

Also, we asked the interviewees to provide us with additional barriers they perceive in their organization. We gathered 473 additional comments, from which we could identify 35 distinct barriers to knowledge maturing. Among those, the most important was related to “organizational culture” (20%), which refers to patterns of shared basic assumptions and beliefs in an organization (Schein 2003). We define also organizational culture as something that cannot be changed in a short period like e.g. the structure of the management or a so called “hierarchy culture” between e.g. a project leader and his team.

The barrier organizational culture subsumes also aspects like “lack of individual autonomy”, “lack of formalisation and guidance”, “lack of collaboration” and “personal interdependencies”. This also relates to the previously mentioned barriers “lack of time” and “fear of embarrassment”, which further increases the importance of the cultural dimension.

2.2 Knowledge Maturing Activities

Interviewees were also asked about the perceived importance and success of performance of twelve different knowledge maturing activities. Within our project, we define knowledge maturing activities as individual or group activities that contribute to the goal-oriented development of knowledge within an organization. Knowledge activities in general have their roots in the perspective of practice of knowledge work [Ka10]. While most answers were in agreement of the proposed activities, there was one activity with a high dissension among the participants: “restrict access and protect digital resources”. A further analysis of the 42 comments related to this activity led to two possible interpretations: (a) statements whether and why the organization restricts access and (b) statements about personal opinion whether restricting access is beneficial to knowledge maturing.

From an organizational perspective, a mixed picture emerged. Some organizations have very few restrictions (related to an open organizational culture), whilst others are giving high priority to restricting access. In some cases, this is due to the fact that organizations are required to protect their information (e.g., data related to their customers), for others this is part of protecting their own competitive advantage. In fact, several organizations in high technological sectors have recognized the importance of the knowledge maturing activity “restrict access and protect digital resources”. In those organizations, this activity is perceived as a normal work practice to channel the knowledge through the right users and to avoid dissipating it. It is a common practice to improve the structured knowledge and to support the diffusion among the employees correctly. This activity ensures the correct classification of knowledge and secures the diffusion with the most appropriate policy.

From the individual perspective we identified three main reasons, why restricting access may be important:

- **Trust as a prerequisite for knowledge sharing and collaboration.** Interviewees mentioned that they consider restricting access as a measure to create a protected space in which you can more freely exchange knowledge because they trust each other. *“There are people who will share only in a limited way if they can trust that not everyone can see it.”*

- **Information channeling and avoidance of information overload.** The underlying assumption of this argument is that shared knowledge and information leads to a counterproductive work overload situation.
- **Data security and fear of competition.** While in many cases, data security and fear of losing competitive advantage was seen as a given necessity, in some cases the interviewees also shared the company's position that this is essential. In other cases, there were more critical statements that this obstructs knowledge maturing: Overall, 14 comments suggested that restriction means obstructing people's access to knowledge. Answers range from "nonsense" to critical reflection on their organization's practice: "*The access rights are pretty strict, as extreme as personnel office not being able to see my drive, my drive cannot be seen by my colleagues, I find that unbelievable.*", or also "*We are destroying knowledge in this area*".

2.3 Further Results

Also for organizational culture aspects, on the one hand, the interviewees stated that they often missed the possibility to feel **autonomy** and that bureaucracy can hinder participation in knowledge maturing. This can be seen in the following interviewee comments: "*management structure can be restrictive*" and "*too bureaucratic*".

On the other hand, the **lack of formalization or standardization** of processes is also a salient problem, especially when the organization changes too fast or communication is not guided and encouraged by a dedicated person. If this happens, like we have seen in the comments "*Organization changes fast, lots of changes as time goes by.*" or "*This is sometimes not guided enough. I think that it is important that someone controls the communication and pushes it, and that this is too little in some areas.*", then we truly observe a barrier for knowledge maturing.

For sure, **missing collaboration and personal interdependencies** are accompanied together. Missing or not enough discussions can seriously block knowledge maturing as well as misplaced employees with missing specific skills and expertise for their work. Example comments: "*lack of communication and 'selling' skills of employees.*" or "*no possibility for communication, culture.*"

The analysis of the data has not yielded any significant difference between different countries. This indicates that **national or language culture** has no major impact on our results.

3 Theses for the Mutual Relation between Information Technologies and Cultures

After presenting the different results from our empirical study, we want to propose some theses for interdependencies of IT and culture, which are derived from these results. By this we want to achieve a better understanding and a mutual relation for knowledge maturing and informal learning support at the work place.

3.1 Organizational Culture Is More Important Than National or Professional Culture

One surprising result of the study was that we have no indications from the study that national culture has a major influence on knowledge maturing. On the contrary, it has been found that organizational culture plays a major role in this respect, without distinction of the industrial classification of the company. Professional culture can be seen somewhere in between: slight tendencies of differences between HR professionals at the one end, and engineers at the other end could be observed, e.g., in the case of “restricting access to resources” for engineers, in contrast to open sharing and collaboration by HR professionals.

So it is important for Enterprise 2.0 to establish trust and at the same time show the possible value of the activities for the individual and the organization. A “concept of care” is very important for the organizational setting, although it can differ with respect to the professional culture (Koch & Richter 2007).

This implies that culture awareness for designing knowledge maturing support should concentrate on the organizational culture. This has been further confirmed by focus group studies and formative evaluation of one of our tools: the people tagging demonstrator (Braun et al. 2010). This of course does not presume that, especially in bigger companies, there is only one single organizational culture, but rather a collection of sub-cultures have to be considered.

3.2 Narratives Are More Suitable Than Models

When it comes to communicating the understanding of cultural aspects to developers of software solutions, the appropriate means are difficult to choose. Models for cultural as well as motivational aspects, e.g. the two-factor theory that could structure the communication are way too abstract to provide concrete guidance for system development (Herzberg 1993).

Within the project MATURE, it has turned out that narratives are the most appropriate approach. In the first year of the project, we have conducted ethnographically informed studies in which interdisciplinary teams including developers have studied workplace practices and barriers to knowledge maturing (Barnes et al. 2009, Koch 1998). One of the most important outcomes were contextualized stories about the observed individuals that have yielded a rich picture of the real-world and target context of the solutions.

These stories have been partly captured as narratives in persona descriptions (Aoyama 2007). As an example, we provide the description of the persona “Silke”: *“Silke has high personal standards and aims at continuously learning to improve her work practice. To that end, she regularly reflects about how tasks were carried out and what could have been done better or worse. Based on those insights, she updates templates and process descriptions. Where possible, she discusses her experiences with others. She also regularly visits the operational departments in order to learn about the current situation, problems, and developments. She has very high personal standards and is committed to improving her work practice in all aspects. She is very open and interested, also in topic not directly related to her current work situation. She tries to make sense of new trends. Her sense of perfection also applies to her everyday task management. She plans her tasks and appointment each day meticulously, and prepares each meeting with elaborate notes. She always uses paper and pencil for that, and she needs the feeling of satisfaction of ticking off completed items. She often has problems with the usability of computer software. Particularly, labels, buttons, and icons should be uniform across different applications and should not change with software updates. Clear structures within the applications are crucial as she lacks deep knowledge about computers.”*

The undertaken interviews helped us to better understand our quantitative findings and also gave us as a rich summary of the insights that the interviewees gained during the whole interview. We called these narratives “knowledge maturing stories”. We give a short example from a construction company, which struggles with an organizational culture barrier: *“The processes of formalizing and standardizing ideas are carried out by a small number of persons only, being designated work tasks as part of their roles within the company. However, new technologies are heavily blocked and even censored. Electronic mails are printed and filed as hardcopies. There is a hostile attitude towards new ideas and their distribution in communities. Communication does only take place as a top-down action whereas proactive communication across departments or in a bottom-up manner is neither desired by the management nor part of the company's culture. It is questionable if such an attitude leads to success, particularly in the case of a change in management with people who are familiar with new technologies. However, the company flourishes and there is no urge for a change as the formalizing and standardizing of knowledge is well supported by the management”.*

3.3 We Need Culture-aware Design Frameworks

When it comes to implementing culture awareness in concrete design decisions, it has proven useful to identify concrete design options and relate them to cultural aspects. One example is the previously mentioned Enterprise 2.0 people tagging application where employees can tag each other and develop a shared vocabulary of describing interests and capabilities. At this point we need to develop a design framework with design options and questions answered like: *“Who can tag?”*, *“Who can be tagged?”* or *“How is the vocabulary controlled?”* These hypotheses have been validated in two focus group workshops with HR experts both from academic institutions and different industrial sectors (Braun et al. 2010b).

It has turned out that from an organizational development perspective it is not the best approach to seek a universal form of linkage of organizational culture aspects to design options. Rather, as part of a participatory introduction process, these options should be explained to the company representatives with the use of narratives about risks and potentials of the implications of certain design options to create culture awareness. There is no “one-size-fits-all”-solution possible, but each organization has its own individual profile, despite of maybe given similarities of the industrial sector, and therefore needs an individual culture-aware approach and solution, which takes more the form of a dialogue between design possibilities and organizational constraints.

4 Discussion

In this position paper we raised three different theses, which need to be considered for a mutual relation between information technologies and cultures. We consider culture-aware design frameworks as a key aspect to reach this goal. The consequence for organizational development and change-management process is evident: flexible and configurable tools that provide a variety of possibilities to get used in different ways for different organizational cultures.

Narratives proved in this case to be a very effective and an easy way, to highlight the real situation, instead of a model, that never can be as exact as the real situation at the organization. National cultures have not been found to play a significant role, but instead professional and organization cultures are more important.

In our empirical study was organizational culture with the four outlined aspects autonomy, lack of formalization, missing collaboration and personal interdependencies an important issue in all countries. Keeping in mind these aspects and trying to align them with our three theses, is a promising way to support knowledge maturing in organizations.

Acknowledgements

This work was partially supported by the European Commission within the 7th Framework Programme of DG INFSO as part of the Integrating Project MATURE (contract 216356). We wish to thank the other partners of MATURE, particularly those involved in the interviews for the fruitful collaboration.

References

- Aoyama, M. (2007). Persona-Scenario-Goal Methodology for User-Centered Requirements Engineering. In: *Proc. 15th IEEE Int. Requirements Engineering Conf.*, Delhi, India, pp. 185-194.
- Barnes, S.; Bimrose, J.; Brown, A.; Feldkamp, D.; Kaschig, A.; Kunzmann, C.; Maier, R.; Nelkner, T.; Sandow, A.; Thalmann, S. (2009) Knowledge Maturing at Workplaces of Knowledge Workers: Results of an Ethnographically Informed Study. In: *Proc. 9th Int. Conf. on Knowledge Management and Knowledge Technologies*, Graz, Austria, pp. 51-61.

- Braun, S.; Kunzmann, C.; Schmidt, A. (2010) People Tagging & Ontology Maturing: Towards Collaborative Competence Management. In: *From CSCW to Web: European Developments in Collaborative Design*, CSCW Series. Springer, pp. 133-154.
- Braun, S.; Schmidt, A.; Zacharias, V. (2010b): People Tagging - Aspekte und Möglichkeiten zur Gestaltung. In: *Proc. of Mensch & Computer - 10. fachübergreifende Konferenz für interaktive und kooperierende Medien – Interaktive Kulturen*. Munich, Oldenbourg, pp. 139-148.
- Fank, M.; Katerkamp, U. (2002) Motivation und Anreizsysteme im Wissensmanagement. Online at: http://www.contentmanager.de/magazin/artikel_255_motivation_anreizsysteme_wissensmanagement.html.
- Günther, J. (2010) Wissensmanagement 2.0 – Erfolgsfaktoren für das Wissensmanagement mit Social Software. Stuttgart, Fraunhofer.
- Herzberg, F.; Mausner, B.; Snyderman, B. (1993) *The Motivation to Work*. Transaction Publisher.
- Kaschig, A.; Maier, R.; Sandow, A.; Lazoi, M.; Barnes, S.; Bimrose, J.; Bradley C.; Brown, A.; Kunzmann, C.; Mazarakis, A.; Schmidt, A. (2010) Knowledge Maturing Activities and Practices Fostering Organizational Learning: Results of an Empirical Study. In: *5th European Conf. On Technology Enhanced Learning (EC-TEL 2010)*, LNCS, vol. 6383, Springer, pp.151-166.
- Koch, T.: (1998) Story telling: is it really research? *Journal of Advanced Nursing*, 28, pp. 1182-1190.
- Koch, M.; Richter, A. (2007) Enterprise 2.0 – Planung, Einführung und erfolgreicher Einsatz von Social Software in Unternehmen. Munich, Oldenbourg,.
- Kunzmann, C.; Schmidt, A.; Braun, V.; Czech, D.; Fletschinger, B.; Kohler, S.; Lüber, V. (2009) Integrating Motivational Aspects into the Design of Informal Learning Support in Organizations. In: *Proc. 9th Int. Conf. on Knowledge Management and Knowledge Technologies*, Graz, Austria, pp. 259-267.
- Pfeil, U.; Zaphiris, P.; Ang, C.S. (2006) Cultural Differences in Collaborative Authoring of Wikipedia. *Journal of Computer-Mediated Communication*, 12, pp. 88-113.
- Schein, E.H. (2003) Organisationskultur. *The Ed Schein Corporate culture survival guide*. Bergisch Gladbach, EHP.
- Schmidt, A. (2005) Knowledge Maturing and the Continuity of Context as a Unifying Concept for Knowledge Management and E-Learning. In: *Proc. 5th Int. Conf. on Knowledge Management and Knowledge Technologies*, Graz, Austria.
- Schachner, W.; Tochtermann, K. (2008) *Corporate Web 2.0 – Band II*. Aachen, Shaker.

Contact Information

FZI Forschungszentrum Informatik
Forschungsbereich Information Process Engineering
Athanasios Mazarakis, Christine Kunzmann, Andreas Schmidt, Simone Braun

Haid-und-Neu-Str.10-14
76131 Karlsruhe
Email: {mazarakis | kunzmann | aschmidt | braun}@fzi.de