

# Social Software for Professional Learning:

## Examples and Research Issues

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### Abstract

*Social software is used widely in organizational knowledge management and professional learning. The PROLEARN network of excellence appreciates the trend of lowering the barriers between knowledge and learning management strategies for organizations and individuals. But, companies should not underestimate the needs for systematic support based on sound theories and technologies. We illustrate the requirements by examples and research issues for collaborative adaptive learning platforms for workplace learning in organizations.*

### 1. Introduction

Social software - often connected to older forms of computer mediated communication (CMC) and newer discussion about online communities - can be defined as software that supports activities in digital social networks. Social software is becoming quite popular in organizational knowledge management. Because of the close relationship between knowledge management and professional learning [4], we want to investigate the use of social software in the context of the workplace and how it supports learning in that context. Because social software was not intended specifically for professional learning, many challenges are raised by the ready acceptance of these technologies. The perceived usefulness and the perceived ease of use of social software, e.g. tagging learning resources, contrasts with the need for efficient data structures, algorithms and interoperable infrastructures to store, maintain, and deploy learning objects on the web. Learning management systems tackle those problems by the introduction of metadata descriptions of learning objects. Also, among others, issues concerned with the quality, security, costs, and authority of learning objects are critical. We aim to explore the future evolution of social software in the context of

professional learning and how this influences the further development of metadata and interoperability. Our approach is the systematic integration of social software in new collaborative adaptive learning platforms (CALP). In this paper, members of the PROLEARN Network of Excellence in Professional Training ([www.prolearn-project.org](http://www.prolearn-project.org)) discuss different past and ongoing projects within this area and explore research issues for the topic social software which has become a new work package of the network in 2006.

The remainder of the paper is organized as follows. In section 2 we draw on the current use of social software in organisation. In section 3 we give a short introduction in the theoretical background. Section 4 gives examples from current research and creates a list of research issues. Especially evaluation and monitoring are addressed in section 5 after which we conclude and give an outlook on further activities.

### 2. Blogging for Business

We discuss blogs here as an example for a class of software used now often in organizations, e.g. corporate wikis, social bookmarks, web feeds. The term Blog is a contraction of 'Weblog' and the act of 'Blogging' is the making of such logs [11]. Some businesses are coming to understand that 'real' news isn't just a ticker-tape-like news fed from Reuters or the BBC. In business, the most significant news is what you and those you have reason to care about, did yesterday, are doing today, and plan to do tomorrow. This simple and high impact concept is now powering social networks at the heart of the new 'Web 2.0' world. In their simplest form they are used as stream-of-consciousness public web diaries or activity logs, hence 'weblogs'. Members of your community can "subscribe" to blogs and upload comments to them – and even vote on the significance of the entries. In this way, this simple and yet pervasive set of tools has formed a large number of significant public

“communities of practice” [Weng98] around the bottom-up drive of community members. One drawback of a blog is a lack of continuing input. The most popular blogs are those that receive regular updates. Their sequential nature also means that old postings are almost never revised or updated, but commented, perma-linked, and track-backed [2]. Blogs are generally searchable, but there are search engines specifically aimed at the BlogSphere, such as **Technorati**, where bloggers are encouraged to manually meta tag their postings. The sequential nature of a blog makes it an ideal candidate to produce an RSS data stream. RSS (Really Simple Syndication) is a format for syndicating news and the content of news-like sites, including major news sites, news-oriented community sites, and personal weblogs.

Successful corporate blogging programs have tended to focus on a very simple business aim. The most visible are those with a simple ‘public relations’ function. In the UK for example **Cadbury Schweppes** (see

[www.cadburyschweppes.com/EN/Careers/UKGradRec/BusinessAreas/](http://www.cadburyschweppes.com/EN/Careers/UKGradRec/BusinessAreas/)) have tasked a set of “graduate recruits” in its key business areas to help get a better idea of what it’s like to work for the company. The theme of presenting the company to potential recruits is one echoed in very many larger companies. In Germany, **SAP** has tasked some key executives to maintain a set of public blogged conversations to help frame a public view to their clients and partners (see [www.sap.com/community/pub/blogs.aspx](http://www.sap.com/community/pub/blogs.aspx)). This level of ‘senior staff’ presenting the face of the company is a relatively common use for blogging in organizations [1].

With the appearance of software tools that serve the individual’s needs for active communication, knowledge sharing as well as social networking, the range of creating a personal landscape of tools and services has increased. At the same time, organizations have started to integrate social software applications into their organizational landscapes as well or offer them as an additional means for knowledge sharing. It seems very likely that this development accelerates, since people are already enriching their “digital life” with an expanding palette of social software applications. Following the recent developments initiated by a more individualized approach to social software tools and services, we perceive that a number of implications need to be addressed from an organizational, a technical and social perspective. Opening the boundaries between the individual and the organizational landscapes allows the individual to bring his/her personal social networks into the workplace environment. Breaking up the barriers

between personal and professional networks has a potential added value in store for the workplace organization. Social capital theory [8] supports the idea that the weak ties are important for the exchange of knowledge.

One of the major features of blog is the “reputation management” of participants. Indeed, we have recently seen the emergence of so called “Ghost Blogging” services for companies who want more professional marketing and support of their blogging output. As with any ghost-written autobiography, the ghost blog gets professional input to ‘improve’ the output. Expertise in any social network is assessed through performance as well as the relevant application of knowledge to new problems. Blogs can show participants’ daily engagement with key issues. Participants can gain significant reputation in their community by “being seen” publicly creating valuable artifacts that is of use to new members of their group. At the moment this process happens primarily in a large but self-referential set of communities, but the movement is growing steadily. The theoretical background for the above described phenomena is explained in the next section.

### 3. Social Exchange Theory, Reinforcement Mechanisms and Learning Networks

Currently an integrated approach that allows rewarding and incentive mechanisms on different levels of sharing and exchanges (knowledge resources, learning activities, competence development programmes) is researched in the **TENCompetence** project (see [www.tencompetence.org/](http://www.tencompetence.org/)). A main critical point in building social software that is actually used and in developing communities that become active learning networks [20] is the engagement in the sense of active participation and contribution of the individuals. The individual satisfaction and perception of effectiveness in that sense is closely related to the commitment of the individual to contribute and actively participate. Social exchange literature [6] describes four main incentive mechanisms that are relevant to motivate and encourage community members to commit and contribute to common activities, those are **personal access, personal reputation, social altruism, and tangible rewards**. Different classifications have been made between individual and interpersonal factors [7]; hard and soft rewards [9]; quantitative vs. qualitative gain, intrinsic vs. extrinsic factors, and others. A question about **tangible rewards** is the balance between individual interests and external motivation. The contribution to a public good, as tangible asset

often fosters greater individual self interest by external motivation and therefore also can reduce intrinsic motivation to contribute to a network. Recent experimentation in learning networks have shown that incentive mechanisms like the adaptive introduction of extra (bonus) material based on contributions can increase both active and passive participation in learning networks [10]. Beside the individual activity adaptive rewarding mechanisms [3] could also take into account the current needs of the community and the style and quality of individual contributions in the past.

## 5. Collaborative Adaptive Learning Platforms

Social software techniques enable richer capturing of context in which content has been produced. Finer granular and explicit capturing of this kind of context offers substantial potential for automating metadata production (for instance: by reusing metadata from artifacts produced by “close neighbors” in the social network). We are integrating this sort of social software in our **Automated Metadata Generation** framework [17, 5]. Similarly, social-software-based context capturing offers great potential to create advanced tools and services for dealing with the need for content. A rather simple example is to augment user queries with metadata that constrain results to those that are relevant to the context at hand. A more advanced example is to alert users to relevant content, even before they are aware that it may help them in the task at hand.

In the **WINDS** [12] project university professors and their colleagues have created 21 online courses in Architecture and Engineering Design (see <http://winds.fit.fraunhofer.de/>). Our objective was to overcome the gap between pedagogues and technicians by considering the instructional requirements in the design and implementation of the learning platform. The WINDS experience shows that teachers, even without programming skills, can create web-based adaptive courses and students can benefit from the usage of these courses. According to the evaluation it seems that the WINDS environment succeeds in fostering general learning. If we want to go beyond the “no significant difference phenomenon” more attention must be paid to innovative approaches and new opportunities enabled by online instruction.

**Open Classroom** [13] is a software platform that enables real time collaboration and authentic real world learning experiences, e.g. school classes visiting a chemistry lab without leaving the classroom or

meeting friends and business partners from all over the world (see <http://oc.fit.fraunhofer.de/>). The Open Classroom offers the possibility of live participation and live interaction. Photos, audio comments and video reach the classroom in real time and students there can immediately ask further questions. With the help of audio- and text-messaging students in the classroom can determine the proceedings at the field trip site. Videoconferencing enables them to interview experts without leaving the classroom.

The research of the KMR group in Stockholm revolves around a structured information architecture called a **Knowledge Manifold (KM)**. A Knowledge Manifold supports a number of different strategies for the suppression and presentation of information. It consists of a number of linked information landscapes (contexts), where one can navigate, search for, annotate and present all kinds of electronically stored information. A KM is constructed by conceptual modeling of a specific knowledge domain in order to capture its underlying thought patterns in the form of *context-maps* constructing a kind of *Human Semantic Web* [16] which functions as a conceptual interface to the underlying (machine) Semantic Web.

**Confolio** (see [www.confolio.org/](http://www.confolio.org/)) is a semantic web-based electronic portfolio system [18]. The Confolio system also contains a distributed opinion publication network, where each portfolio owner can publish opinions on anything that has a publicly retrievable URI which of course is anything on the Semantic Web. Although such opinions are directly visible on their “annotation target”, they are in fact controlled by the annotator and stored in her/his own Confolio. This has powerful implications on learning, as well as on social web-interactions in general, since it makes easily visible what people actually think of the resources on the web – creating what in evolutionary terms could be called a selection pressure for the enhancement of quality.

These approaches lead to new **collaborative and adaptive learning platforms (CALP)** which neatly integrate elements from social software use with the need for business oriented learning management systems for professional learning. Basic mechanisms will be e.g. collaborative content creation, real-time collaboration, real world experiences, recommendation algorithms for joining communities and (semi)-automatic metadata crosswalks.

The main aims of CALP are on the one hand to achieve the highly challenging task of personalized adaptive learning. That is, to deliver quality learning resources that are tailored to the learner’s needs, preferences, interests, skills, learning goals, cultural background etc. On the other hand, CALP will support

knowledge sharing and community building. In CALP, we focus on personalization and collaborative work as the cornerstones of the learning process and means to improvement, performance and effectiveness. The primary goal of CALP is to connect people to people and people to the right knowledge object. CALP encompasses these elements:

(a) Support for personal knowledge management using personal blogs to help people organizing and exchanging their personal knowledge and the knowledge they have acquired.

(b) Support for co-operative learning object creation using group blogs and wikis as collaborative and effective knowledge capture systems that support learning communities in designing, creating, reviewing, commenting, modifying, and posting up-to-date and valuable learning objects in a short time.

(c) Support for LOM-compliant automatic metadata generation to enable indexing, storage, search, and retrieval of appropriate learning objects and learning paths relevant for a specific learner or a group of similar learners.

(d) Support for personal annotation of learning objects. This aims at allowing the learner or the learning object creator to annotate the content in much the same way she would annotate on a paper.

(e) Support for access and search across content, metadata, web feeds. A learner should be able to query remote learning object repositories or blog-based distributed learning communities to quickly locate appropriate learning resources.

(f) Support for personalized learning object delivery through an intelligent adaptive engine, being able to connect people to the right knowledge and deliver quality learning resources that are tailored to the learner's preferences and learning goals.

(g) Support for personal social networks to facilitate bottom-up socialization, that is, help people build new relationships and enable them to join learning communities based on their preferences.

(h) Support for personalized expert/community retrieval. The idea is to connect people to people through content. By searching blog-based distributed communities via metadata and web feeds and assessing the blogger's digital reputation, it is possible to identify experts inside or outside the organization with the required know-how that can help achieving better results or persons who share the same interests.

Starting with this list of requirements we hope to come closer to our goal of a systematic integration of social software like corporate wikis, social bookmarks, web feeds, and blogs incorporating different kind of media in learning platforms for professional training. Coming

to the end, the question to answer still open is: How to evaluate this new kind of learning platforms?

## 8. Evaluation and Monitoring of Social Software

Two major critical success factors for professional learning social software are high **usability** and good **sociability**, with each of them comprising a set of criteria and measures [19]. Whereas usability is concerned with how users interact with technology, sociability is concerned with how members of a community interact with each other through the enabling technology. To produce a complete and consistent set of quality requirements for design and evaluation of social software, the critical and foremost step is to develop and document a *quality model*, which essentially consists of quality attributes, sub-attributes, criteria and metrics. Grounded in several theoretical frameworks commonly endorsed in the HCI research community [14], four key quality attributes and their sub-attributes for social software are identified: **Usability, Functionality, Interactivity, and Naturalness**. There exist no standard ways to measure the above attributes, making benchmarking studies especially difficult. Evaluation of social software is demanding, given the high variability in users, tasks and contexts. The extended period of interaction among multiple and dynamic user groups may render the conventional, general evaluation methods inadequate. Consequently, remote field evaluations in addition to user-based lab tests and triangulation of measures with pluralistic approaches should be deployed.

The integration of social software into the world of learning management systems and professional learning demands intensive discourses between practitioners, professionals, and scientists from different fields. Digital social networks change the agency of people by the visibility of 'things', how they are created and managed and framed in discourses. The 'cow paths' in social software are results of unintended collective action. We find these paths attributed by other media (e.g. blogrolls). People are agents and/or patients in these media creating digital social networks [15]. In professional learning, people need tools to monitor these processes, to assess the network from a structural and a content perspective. The goal is to sustain the agency of people in professional learning in complex, dynamic situations like the European Professional Learning Area. Therefore, we aim to gather and store information available in the professional learning area on different

media like emails, newsletters, websites, blogs, wikis etc. in a common media base, to analyze and measure the information with cross-media social network analysis tools, and to visualize the results for the community enabling cross-media analysis of the online archives and the vivid online discourse. Design and engineering issues are targeted and cross-checked by e.g. log analysis tools and website feature analysis. We deploy cross-media social network tools for monitoring and self-monitoring purposes of the affected communities. Community members e.g. can assess the relevance of community features for their community building and maintenance processes. Put together the underlying research question here is: How to quantify and qualify user experience in deploying social software?

## 5. Conclusions and Outlook

The PROLEARN network of excellence has recognised the obvious trend of social software use in professional learning. We have tried to illustrate the motivation for the trend and to give some theoretical background. From our experiences in previous and ongoing projects we are motivated to identify some systematic solutions for professional learning at the workplace. We sketched some key requirements for collaborative adaptive learning platforms. Evaluating such platforms by providing companies and people with tools for self-monitoring their behaviour in social networks is a great challenge. In the PROLEARN network, the work package “social software” has dedicated to tackling this issue. We will organise a series of events around the topic of social software for professional learners, aiming to bring together social software researchers and practitioners in an open space for in-depth conversations about their work, possible trends, and visions. The topics covered include business perspectives such as the potential of software tools for knowledge sharing and professional learning.

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