A Social and Personalized Learning Platform for Vocational Social Media Education

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Abstract

Social media have become central to information gathering, sharing, and dissemination also in the business world. Opening up opportunities but also exposing new risks, the professional use of social media within the enterprise requires a broad range of skills – including search, selection, evaluation, administration, creation, and publication of information. Motivated by the lack of social media training in today's vocational education and qualification chain, we are developing an open educational platform to support the development of social media skills, targeting trainees, teachers, and supervisors. At its core, the platform integrates an eLearning platform built upon social learning techniques, allowing users to collaboratively discuss and enrich learning objects. The learning experience is driven by semantics-based, personalized recommendations. We motivate the need for the platform, sketch the use cases in focus, and discuss challenges, concepts, and innovations.

1   Introduction

Social media have become an integral part of everyday's working life, particularly in the ICT industry. Concrete examples for the use of social media in the business world include wikis, blogs, cloud-based file or document sharing services used in collaborative projects for knowledge management, professional community sites like LinkedIn for networking, and company engagements at Facebook

and Twitter to disseminate information, run marketing campaigns, or to stimulate communication with customers and partners. The skills that are needed to leverage the potential of these channels in the enterprise context are diverse, last but not least due to the different types of social media channels. The classification in [6] categorizes social media into six categories: (i) classical social networking sites (like Facebook or LinkedIn), (ii) collaborative projects (e.g., Wikipedia), (iii) blogs (e.g., WordPress), (iv) Content Communities (e.g., YouTube), (v) Virtual Social Worlds, and (vi) Virtual Game Worlds. In particular the first four categories are highly relevant in the business world.

Current studies [3][7] indicate that nowadays between two-third and three-quarters of companies use social media or have plans to use it to support business activities. This indicates that its opportunities and benefits have been widely acknowledged in the business world. However, it should not be disregarded that its use also comes with risks. To name just few, information distributed through social media channels are not necessarily validated or correct, yet employees may blindly rely on them; employees may (possibly by mistake) make internal information publicly available; and social media marketing campaigns risk to end up in so-called "shitstorms", which may cause damages to companies and their brands. Hence, it is important that employees understand not only the opportunities, but also the risks associated with social media, and learn how to use them effectively and with discernment.

To increase the awareness for opportunities and risks of social media and to convey the skills that are needed to facilitate a professional use of available channels, we argue that social media skill training should become an integral part of curricula in vocational education. This holds especially in the ICT domain, where employees are confronted with channels like blogs, forums, and social networks on a frequent basis. Backing this opinion, a report from the German Ministry for Education and Research [12] suggests that a digital society and culture should put highest priority on social media education to stay competitive in a more and more digitalized world. As a pioneer, Switzerland is currently planning to integrate media competencies into the curriculum already at primary school level [18].

In response to these requirements, we are developing the *Social Navigator*, an end-user oriented platform containing open educational resources to support the education of social media skills. It is developed as part of the interdisciplinary project KOMMIT[1], which aims at a deep integration of social media education in the vocational ICT education chain. The design of the platform was driven by our analysis in [17], where we identified several tools and approaches that promote collaboration in e-learning scenarios by the use of social and digital media. Technically, the Social Navigator builds upon an existing software platform for administering and delivering Massive Open Online Courses[2], developed by the project partner IMC AG. Dedicated modules implementing the functionalities and ideas sketched in this paper were developed and integrated into this industrial-strength platform.

Rather than aiming for an "exhaustive" set of learning content covering all facets of social media education, the goal of our platform is to establish a subject-specific portal providing information about concepts, methods, and scientific models regarding the use of social media in educational and business contexts, complemented with exemplified learning content and tools conveying skills to professionally use social media in the enterprise. Incorporating background information and learning content, it aims at engaging all stakeholders in the education process: it shall attract trainees by providing a growing amount of open learning material (lessons, exercises, etc.) as well as general information and links to vocational social media channels (e.g., IT education forums), but also teachers, vocational trainers, and technical employees who want to learn about social media education and use.

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[1] http://www.kommit-projekt.de/

[2] The software is driving the MOOC platform OpenCourseWorld at http://www.opencourseworld.de.

As for any type of learning, learning about the usage of social media can be characterized as an un- or semi-structured process, in which learning content needs to be delivered according to explicit or implicit information needs. Explicit needs can be covered by search engines responding to queries of a user, in which the user formulates well-known information needs. Implicit needs, in contrast, are not transparent to the user. When combining a semantic description of the user and his or her behavior with an appropriate social media skill model, such implicit needs can be automatically derived and communicated to the user. Targeting both explicit and implicit information needs, our platform implements a personalized learning approach driven by semantic search and recommendation. Built on a social media skill model, it takes metadata about learning content, user profiles, and user behavior into account. Different search and recommendation modes cater to different types of user interaction and information needs. It thus can be seen as a multi-purpose information retrieval system that delivers content fitting to a certain learning context for explicit and implicit information needs.

In addition to a web portal serving as a common entry point for all user groups, at its heart the Social Navigator includes a mobile-enabled eLearning client supporting the personalized and self-organized – yet guided – consumption of learning material and exercises. When it comes to the consumption of learning material, our approach builds on social learning technology, namely eLearning tools that enable discussions and interactions directly related to learning material. Realized by features to annotate text fragments in learning objects and share these annotations with other users (who, in turn, can comment and start discussions), social learning technology supports community building and creates an interactive learning experience by (a) confronting users directly with social media and, the other way around, (b) exploiting the benefits of social interactions to increase the learning effects.

The research method applied in this paper follows a design-oriented approach. In information systems (IS) research, design science aims at the construction and evaluation of technology artifacts which contribute to the productive and effective application for humans and organizations [4]. The knowledge base in design science consists of foundations (development of theories, constructs, models, and frameworks) and methodologies (formalisms, measures and validation criteria) [4]. This paper presents a novel concept and architecture design for context-sensitive and personalized learning in vocational education and training. The newly derived concepts in this paper are going to be evaluated in future research using rigorous IS research methods.

The contributions and structure of the paper can be summarized as follows.

- In **Section 2**, we discuss general **skills that are needed for an adequate and goal-oriented use of social media in educational or business contexts**, thereby motivating the need for social media education in general and, hence, our efforts in building the Social Navigator.

- **Section 3** presents the **Social Navigator**. It splits up into a discussion of the **target audience and use cases** (Sec.3.1), both for the platform itself and for integrated learning modules, and the **design and technical architecture** of the platform (Sec. 3.2), including a discussion of components and design decisions.

- Having sketched the big picture, in **Section 4** we discuss **implementation details, concepts and innovations** of the Social Navigator, in particular discussing the underlying **ontology** (Sec. 4.1), its use for and the design of the **search and recommendation engine** (Sec. 4.2) enabling personalized information delivery, and the **mobile eLearning frontend** incorporating social learning technology (Sec. 4.3).

- The paper concludes in **Section 5** with a short **outlook** and a discussion of **future work**.

2   Social Media Skills

Social Media skills describe the capability of adequately applying several types of social media technologies [1], which comes along with the ability of their constructive and receptive use (social media production and consumption) [11]. In [10] we developed and integrated a model describing knowledge and skills for the use of the social web for learning and knowledge exchange. As described there, our approach is based on existing models of more general ICT-literacy as well as models from educational psychology about learning and (individual or collaborative) problem solving in the web.
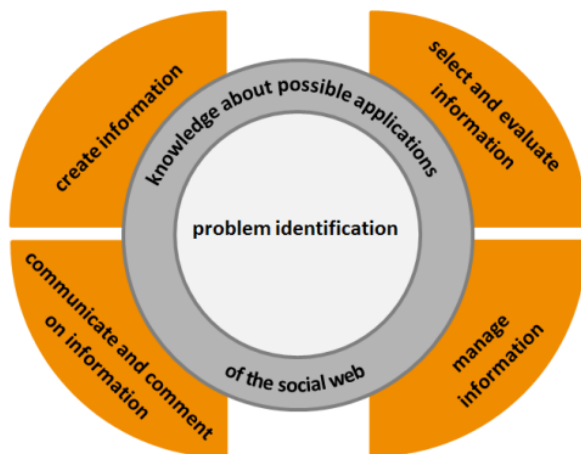

Figure 1: Social Media Skill Facets

The core of the model, the *level of actions*, is sketched in Figure 1. It addresses relevant skill facets (see orange quarter circles) to adequately use social media to reach specific objectives (e.g. finding information or writing a wiki article) as well as knowledge about possible applications of social media tools (see grey circle). The level of actions is influenced by two additional levels, that is, the *general level* and the *reflection level*. The *general level* encompasses general skills (e.g. writing skills, technical skills, or social skills) which are prerequisite to a successful social media use, but which users of the platform (i.e., individuals working in the field of IT) are assumed to have already developed. The *reflection level*, moreover, includes skills like critical thinking as well as legal and ethical reflection, which are important, but not specific social media skills. In the Social Navigator we focus on the *level of actions*, which describes knowledge and skills according to the following four facets:

The skill facet ***select and evaluate information*** describes the ability to select relevant information from a large amount of information and being able to critically evaluate its credibility (e.g. type of website, author(s) / originator(s) of the information, etc.). Furthermore, this skill facet describes the capabilities of comparing information from several sources and finding experts or appropriate networks in the web that provide useful information. Appropriate social media tools used to perform these skills are, for instance, search engines or social networks.

The skill facet ***manage information*** describes the ability of effectively collecting and categorizing information (e.g. assigning keywords or tags, creating a collection of links, etc.). Furthermore, it comprises the ability to keep oneself continuously up-to-date by using useful resources and by knowing how to separate relevant from irrelevant information. Typical social media technologies used to perform these skills are e.g. Social Bookmarking, Social Tagging, or RSS-Feeds.

The skill facet ***communicate and comment on information*** describes the ability of effectively sharing information with relevant target groups. Furthermore, it comprises the ability to adequately respond to other users' contributions or comments in the web. In addition, it comprises the awareness about the fact that one's own contributions and profile information can be visible to anyone on the web and will be available in the long term. Appropriate social media tools used to perform these skills are e.g. discussion forums, social networks, twitter, chats, and media sharing sites

The skill facet *create information* describes the ability of actively creating, augmenting, or modifying information contents. Further, it comprises the ability to synthesize and consolidate information from multiple sources and to prepare information for specific target groups regarding content and language. It comprises the awareness and ability to correctly cite other sources (i.e., to give references). Typical social media tools used to perform these skills are wikis, blogs, or e-learning platforms.

In addition, before a certain task (e.g., writing a wiki article) is carried out, a fifth facet concerns the identification of the task or problem that needs to be solved (see inner circle in Fig. 1). It involves recognizing and describing the task, to define sub goals, solution steps, and required resources. This can be done individually or in a group. Social media can be used for this facet, but not necessarily.

The main goal of the Social Navigator is to support all involved target groups (i.e., trainees, teachers and supervisors) in teaching and learning processes to effectively integrate social media technologies in educational and professional contexts to reach specific objectives. Note that the platform does not model skill *levels*, yet carries out gap analyses based on the user behavior to track the social media skills users have acquired by, e.g., reading documents associated with a given social media skill.

3   The Social Navigator

3.1   Target Audience and Use Cases

The Social Navigator shall support all stakeholders in the social media education chain. In the following, we sketch design goals, benefits, and use case scenarios for the envisioned target groups.

For **trainees**, the Social Navigator constitutes a self-learning platform providing a growing selection of learning materials and exercises conveying social media skills, including the consumption of learning material and exercises. Further, it provides categorized links to subject-specific social media channels such as blogs and occupational discussion forums, allowing trainees to search and browse relevant channels that could be helpful for their professional work. The navigator also allows trainees to play around with selected social media platforms following a sandbox approach, or to use them in exercises and collaborative projects. By integrating social media such as forums into the platform, it becomes possible to share knowledge with the community and comment on learning material on the one hand, and to benefit from community knowledge and social collaborations on the other.

With respect to **teachers and trainers**, one central goal of the platform is to strengthen the awareness for the increasing importance of social media education by providing a large knowledge base including expert reports, scientific articles, and studies. To this end, we are currently developing a MOOC (massive open online course) for teachers and trainers, which will convey knowledge about social media education and will be provided as an integral part of the Social Navigator. In addition, the platform shall provide background information such as academic models, methods, curricula, lesson plans, and learning material. Further, it offers support for the administration and creation of new learning material by the community, making it possible to author and share material amongst trainers and teachers. Following the idea of a Social Network, the platform shall serve as a medium to advertise own content, contribute own experiences, and discuss about topics, exercises, and projects.

Complementing the role for trainers and trainees, the platform shall also attract **technical staff and executives** from companies. Although focusing on social media in the vocational education process, the content of the Social Navigator is equally useful to help creating awareness and train existing employees on social media use cases, required skills, and associated risks. Hence, technical staff and

executives can extract valuable information to initiate and execute targeted trainings for their employees, and contribute practical information complementing the academic content, such as field reports and typical use cases seen from the perspective of the company.

3.2   System Architecture and Design

Figure 1 sketches the technical architecture of the Social Navigator. It builds upon a comprehensive data layer comprising both internal and external resources. The data corpus is modeled according to a domain-specific ontology (cf. Section 4.1). First and foremost, it includes the actual *content*, comprising metadata (such as title, abstract, authors, licenses, bibliographic information, and classifications) and the content itself, either as a file or as a link to external web resources like social network channels, forums, blogs, and relevant web pages. In case external web resources are linked, information from these web pages is crawled in order to improve search and recommendation. In addition to the actual content, the data layer comprises *static user data* – essentially profile information such as name, age, role, etc. – and *dynamic user data*, namely the user-system interaction history, describing which content the users have created, consumed, commented on, etc.
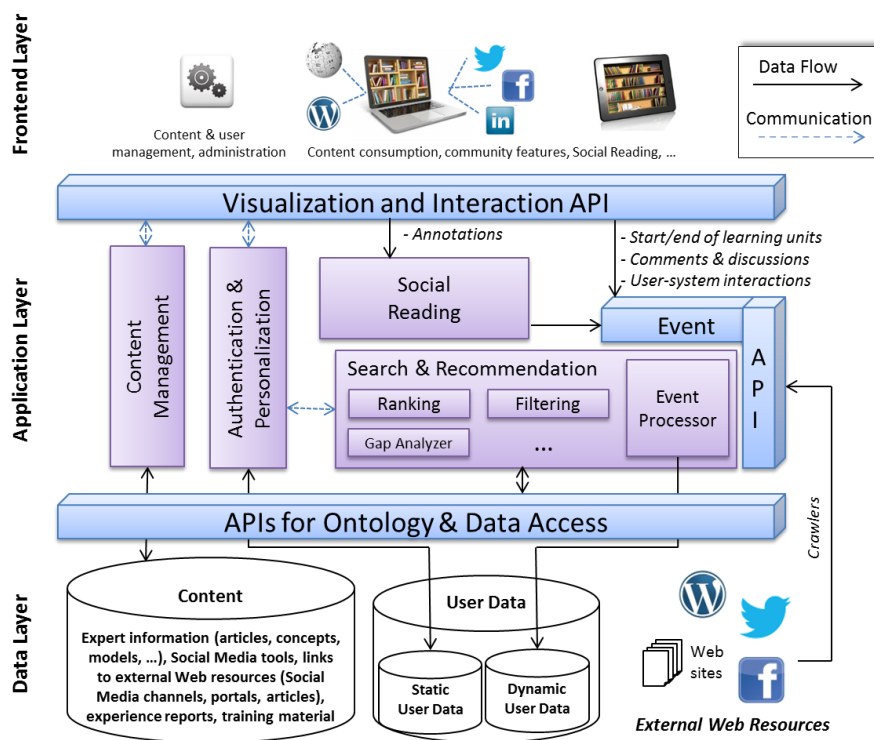

Figure 2: Architecture of the Social Navigator

The data layer is accessible via *APIs for data and ontology access*, to be used by the application layer modules of the platform. Central to the latter is the module for *content management*, which provides functionality to maintain and categorize content or lists of external links as well as to create multimedia-based learning content (such as learning units and interactive exercises). A second module is responsible for *authentication and personalization*: Providing the functionality to maintain static user data and manage the dynamic part of the user data, e.g. by offering access to the user history and interactions, the latter can be understood as the interface towards the user database.

As also sketched in the Figure, the authentication and personalization module is tightly coupled with the *search and recommendation* engine, which asserts personalized information delivery by taking the user's role and interaction history into account. The search and recommendation engine, which will be discussed in more detail in Section 4.2, includes an *event processor* and various other modules for the computation of search results as well as ranking and filtering of results. It is responsible for both providing personalized answers to search and information requests triggered by the user (e.g., by

submitting dedicated search forms in the UI) and computing proactive recommendations for the user based on preferences, skills, and the current context. In this line, the search and recommendation module may propose learning material to trainees, notify them about responses to previous discussions, or point teachers and trainers to articles and expert reports that fit their interests.

As an interface towards the users of the platform, the application layer is providing a *visualization and interaction API*, which allows to (i) provide content to end users optimized for different devices, namely desktop as well as tablet computers, and (ii) to keep track of user interactions with the system and deliver them as input to the search and recommendation engine.

The web frontend is designed as an interface to consume and create content. It is tightly integrated with social media channels, both with connections to interesting and thematically related resources and with integrated social web channels such as forums, blogs, and wikis. They serve as a medium for functional exchange and as a playground for interested users, where they can test and use selected social media channels, e.g. as part of exercises or projects targeting the social media education. The web frontend design follows a responsive design, where design guidelines for mobile applications have been considered. This approach results in a learning environment optimized for mobile use with tablet computers, which offer a comfortable way to consume content (cf. Section 4.3).

4 Implementation Details

4.1 Data Model (Ontology)

Figure 3: Social Media Education Ontology

In previous work, ontologies have been proposed for representing learning object content [15] and context information supporting adaption and personalization [5][9][13]. With the goal to build a domain-specific ontology covering all the concepts and challenges behind the Social Navigator, in a first step we analyzed existing ontologies in the e-learning field to identify relevant ontologies which

can be integrated in the knowledge base of the Social Navigator. We identified the ontologies (Friend-of-a-Friend) FOAF [2] and ALOCoM [15] (Abstract Learning Object Content Model) as highly relevant to integrate in our ontology. Domain specific concepts about the social media skills (cf. Section 2), IT processes in vocational education of the German IT sector, learning fields and target audience have been derived in workshops with representatives from the German vocational education sector such as teachers from vocational schools, trainers as well as psychological research institutes for information management at schools. The resulting domain ontology, which describes the concepts and their interrelationships of the Social Navigator, was obtained by integrating the relevant fragments from FOAF and ALOCoM into the domain specific part of the ontology.

The ontology resulting from this process, modeled using the W3C standard OWL[3], is depicted in Figure 3. The diagram depicts the most important concepts as well as the semantic relationships of the involved concepts and stakeholders. As can be seen, the knowledge base contains information about integrated content, learning processes, tasks and the social media skills.

FOAF as a reused ontology provides a machine readable model of Social Networks. Using FOAF, relationships between persons can be analyzed and visualized [14]. Concepts that have been adapted from FOAF are *foaf:Person*, *foaf:Agent* and *foaf:OnlineAccount* (see Fig. 3). The ALOCoM Ontology is a formal representation for learning objects and related components [16]. It describes how learning objects can be reused. Concepts taken from ALOCoM are *ContentFragment* and *ContentObject*.

In parts, we built an upper-level ontology to integrate the description of learning objects and their contents as specified in ALOCoM to associate them with the person-specific information from FOAF. The novel concepts for tasks, skills, interactions and media containers support the specification of new custom concepts. The concept of content objects is composed of single content fragments (media objects like video, text, image) as well as the content object category which supports the classification of content objects according to specific criteria (training material, field reports, etc.). Based on the ontology, users can actively search for content objects, and content that matches their current situation in the working process and their personal profile is proactively recommended. The content objects are organized in media containers which consist of the components *My Media*, *Catalogue* and *Learning Area*, and *MOOC*. A task is related to a specific topic in the curriculum (e.g. "requirements analysis" within the apprenticeship of "Qualified IT specialists") and requires specific skills. The chosen approach enables the seamless integration of content from repositories supporting ALOCoM or FOAF.

Incorporated in the Social Navigator, the ontology evolves over time and reflects the dynamics in the user's individual learning process as well as the continuously changing amount of relevant information. A dedicated knowledge adaptation component (cf. Section 4.2) uses techniques of ontology learning and ontology evolution to adapt the ontology over time.

4.2   Search and Recommendations

Zooming into the architecture from Figure 2, the search and recommendation component is sketched in Figure 4. It serves as the central entry point for all information needs and requests users might have in their teaching or learning processes. Searches and recommendation requests can be triggered through the Visualization and Interaction API, which allows users to manage media and to use the knowledge base of the Social Navigator. In doing so, users are either enabled to actively carry out searches or to receive context-aware recommendations.

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[3] See http://www.w3.org/2004/OWL/

Within the *context evaluation* component, the received query from the client is enriched with contextual data that can be derived from the user's individual or work context. These relationships are extracted from the knowledge base. Within the information retrieval process, the choice of possible return entities has to be narrowed down (e.g. "only show videos", "only show material for specific skills", etc.). The *filtering component* carries out a first selection of retrieval candidates.

In a next step, the *ranking component* evaluates these retrieval candidates according to several criteria: the appropriateness for the given social media skills, the user preferences regarding topics, the semantic fit to the teaching, learning or work process, etc. The goal is to provide the most relevant content for the current situation in the teaching or learning process.

The *event processor* covers all major events in the lifecycle of integrated data. Whenever external or internal learning objects are created, updated, or deleted, these actions are being notified via this interface. Hence, a continuous

Figure 4: Search and Recommendation Component

actualization of media contents in social networks and in the web can be ensured. Further, relevant events can be continuously evaluated (e.g. when a teacher updates his/her skill profile, or a student has uploaded a presentation about his/her last teamwork in school).

The *information indexer* gathers all information received from the various internal (e.g. Event API) or external (e.g. web) information sources. It brings the metadata gathered from these sources in the internal knowledge representation of the knowledge base. Moreover, using various mining techniques, the raw data of the media contents is analyzed and correlated with topic maps. The gathered usage data updates these correlation metrics over time, which may help to improve recommendations.

The *gap analyzer* evaluates usage data in real time and leverages information from the knowledge base to identify knowledge gaps related to social media skills or weaknesses within the strategy of searching for the right media, neglect of guidelines for the creation of certain content, etc. Based on the usage behavior the platform identifies knowledge gaps (e.g. a student has problems while s/he is creating a blog entry). The statistics in the knowledge base for the respective push recommendations are adapted accordingly, causing the recommender engine to be aware of these changes and to trigger a push recommendation towards the client. Whenever the gap analyzer discovers knowledge gaps for a user, push recommendations are sent to the user via the frontend.

The described components seamlessly integrate with the architecture depicted in Figure 2. Communication with frontends is being carried out via the Visualization and Interaction API, which also exposes major functionalities for performing explicit and implicit search and recommendation queries and to return appropriate result sets. The APIs for Data Access manage the persistence operations for the ontology structures, the knowledge base and arbitrary search indices and caches.
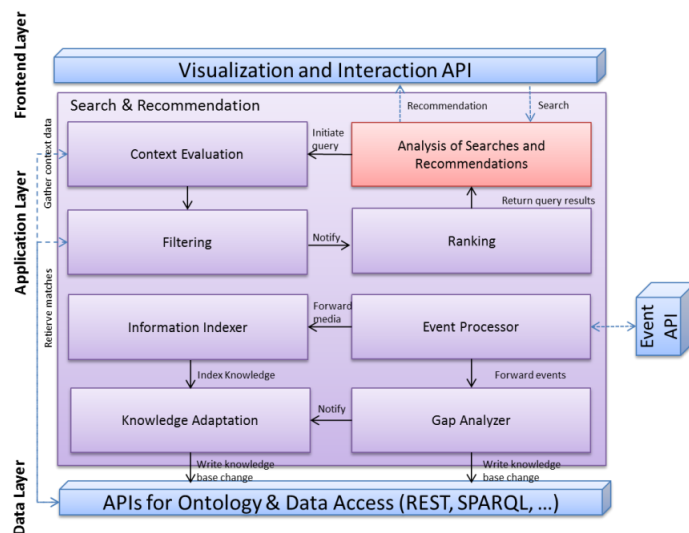
4.3   Mobile-enabled Social Learning Frontend

The frontend is optimized for mobile access and builds upon the idea to provide Social Reading functionality on top of learning material represented as eBooks. In this line, it aims at stimulating the interaction of learners by supporting social bookmarking, discussions, and annotations of learning material. To give examples, users can comment on paragraphs of eBooks, attach video files to sentences, or interlink words in the text with articles from open knowledge bases such as Wikipedia.

Technically, Social Learning is implemented via annotations of digital text content. Traditionally, annotations on paper books may serve different functions within the learning process, such as the signaling for future attention, placemarking and aiding memory, problem-working, interpretation, tracing process, or incidental reflection of the material [8]. In the context of our mobile learning environment, these annotation functionalities are enhanced in two different ways:

- First, annotations may not only contain textual content, but also provide links to other resources, e.g. to web pages delivering context or background information or to social media such as YouTube videos, Wikipedia articles, etc. By sharing these annotations publicly with other users or user groups, all stakeholders – in particular learners, teachers, and trainers – can collaboratively augment the learning material with external background information, thus constantly increasing the information content and value of the learning material.

- Second, social annotations are a means to stimulate social interaction that is tightly bound to (specific fragments of) the learning objects: text annotations can be used to raise open questions inline, comment on text passages, and start interactive discussions with other users. Annotations that are made by users and marked as public are immediately visible to other users, facilitating a contemporary discussion and knowledge exchange between learners. As such, social annotations increase both the users' engagement and their learning experience.

In addition to the Social Learning dimension, the mobile learning frontend builds on the idea of self-organized learning, guided through a navigation module. Rather than following a strict organization of learning materials in sequential courses, users can organize their learning material in private and shared libraries according to their preferences. Such libraries may contain different media types, including eBooks, audio, video, but also interactive exercises. Regarding library management, the search and recommendation engine plays a crucial role: it suggests personally relevant learning content to users, which can then be added to private or shared libraries by the click of a button.

The benefits of the self-organized Social Reading approach of the Social Navigator are obvious: On the one hand, the integration of the social media technology (such as interactive, forum-like discussions tightly coupled to learning material) implicitly fosters knowledge and skills about the use of social media in a practical setting. On the other hand, it enables an interactive learning experience, stimulates discussions about content and learning material, and increases the value of content, which is iteratively enhanced with annotations providing context information or links to background material.

5   Conclusion and Future Work

The new concepts of the Social Navigator have been tested in workshops with teachers and trainees in vocational IT education. The evaluation revealed that features like search, self-organized collection, grouping and flexible sharing of learning materials as well as social learning and personalized recommendations target the needs of the user groups. As to training needs, high relevance was given

to the skill-facets *search and select information* (in particular selecting and judging information quality) and *communicate and comment on information* (in particular share information adequately).

To identify the most important training needs more systematically, we are currently developing tests that help to find out skill gaps with respect to the social media skill facets (cf. Section 2). The tests are piloted in six vocational school classes. The results will influence for which skills facets initial training material will be developed, curated and aggregated. In a second step, the Social Navigator together with the training materials will be piloted in vocational schools within real teaching situations.

Within the pilot phase, a further analysis of user requirements will be carried out to gather feedback for UI design and configurations of filters, rankers and required information sources. According to the feedback, filters, crawlers, and rankers will be configured and plugins will be implemented. Next, a performance analysis against a test data set will be carried out: The system will be analyzed according to state of the art information retrieval metrics such as precision, recall and fall-out. Furthermore, lab tests with test users are going to be carried out to gather feedback for UI design. In the final phase of the project a field test in a real-life vocational education environment will be carried out with a sufficient sample size of users to ensure a qualitative evaluation of the concept. The authors are aware of the risks that may occur particularly in the initial testing phase, as the amount of uploaded and linked contents determine whether the Social Navigator will be successful or not. For this reason, the project members are currently uploading and linking media contents to the platform. To reduce the traditional cold start problem we combine content-based, collaborative, knowledge-based and semantic filtering techniques. Following iterative research and development principles, all steps can have back-loops to previous steps, to align requirements from users with results from conceptual work.

The Social Navigator is devised to be an open community based platform. Its sustainable use strongly relies on user participation as well as quantity and quality of (user-generated) contents. We plan to stimulate community building and content generation in the piloting phase. We will develop dedicated example training materials to be used in the pilots. Based on the experiences, we will provide guidelines and help for the production of own social media training materials. Pilot partners will be invited to share experience reports and training materials.

In addition to its primary purpose, viz. to support training of social media skills within vocational ICT-education, the technology behind the Social Navigator can be transferred to other domains as well. In this line, the developed technology can serve as a general light-weight tool to support learners and teachers to collaboratively work with digital learning materials.

6   Acknowledgments

7   References

[1] Baacke, D (1996): Medienkompetenz, Begrifflichkeit und sozialer Wandel. In A. Rein (Ed.) Medienkompetenz als Schlüsselbegriff, 112–124. Bad Heilbrunn.

[2] Brickley, D; Miller, L (2010): The Friend of a Friend (FOAF) Project. http://www.foaf-project.org/. Abgerufen am 16.09.2013.

[3] Harvard Business Review (2010): The New Conversation: Taking Social Media from Talk to Action. Survey, Harvard Business Review Analytic Services.

[4] Hevner, AR; March, ST; Park, J; Ram, S (2004). Design Science in Information Systems Research, MIS Quarterly, 28(1), pp.75–105.

[5] Jovanović, J; Gašević, D; Knight, C; Richards, G (2007): Ontologies for Effective Use of Context in e-Learning Settings. Educational Technology & Society, 10(3), 47-59.

[6] Kaplan, A; Haenlein M (2010): Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68.

[7] Larcker, DF; Larcker, SM; Tayan, B (2012): What do Corporate Directors and Senior Managers Know about Social Media? Survey, Rock Center for Corporate Governance, Stanford University.

[8] Marshall, CC (1997): Annotation: from paper books to the digital library. In ACM DL, *Proceedings of the second ACM international conference on Digital libraries*, Philadelphia.

[9] Martín, E.; Carro, RM; Rodríguez, P (2006). A mechanism to support context-based adaptation in m-learning. In *EC-TEL: Innovative Approaches for Learning and Knowledge Sharing*.

[10] Oloff, C.; Kammerer, Y.; Gerjets, P. (2013): Theoretisches Rahmenmodell zu Fertigkeiten bei der Nutzung des Social Web für Wissenserwerb, Wissenskonstruktion und Wissensaustausch. *14. Fachtagung Pädagogische Psychologie der Deutschen Gesellschaft für Psychologie*, Hildesheim.

[11] Parola, A; Ranieri, M (2010): Media Education in Action - A Research Study in Six European Countries. Firenze University Press, Firenze.

[12] Schelhowe, H; et. al. (2009): Kompetenzen in einer digital geprägten Kultur: Medienbildung für die Persönlichkeitsentwicklung, für die gesellschaftliche Teilhabe und für die Entwicklung von Ausbildungs- und Erwerbsfähigkeit. Bericht der Expertenkomission, Deutsches Bundeministerium für Bildung und Forschung (BMBF).

[13] Siadaty, M; Eap, TM.; Jovanovic, J; Gašević, D; Torniai, C; Hatala, M. (2008). Semantic technologies for socially-enhanced context-aware mobile learning. In *EC-TEL: Times of Convergence. Technologies Across Learning Contexts*.

[14] Sleeman, J; Finin T (2010): Computing FOAF Co-reference Relations with Rules and Machine Learning. *Proceedings of the Third International Workshop on Social Data on the Web*, China.

[15] Verbert, K; Jovanovic, J; Duval, E; Gasevic, D; Meire, M. (2006): Ontology-based learning content Repurposing: the ALOCoM Framework. International Journal on E-learning, 5(1), 67-74.

[16] Verbert, K; Jovanovic, J; Gasevic, D; Duval, E; Meire, M (2004): Towards a Global Component Architecture for Learning Objects: A Slide Presentation Framework. *Proceedings of the 17th ED-MEDIA*, Switzerland.

[17] Di Valentin, C.; Hegmans, J.; Emrich, A.; Werth, D.; Loos, P. (2013): Conceptual design of a tool for personalized and context-based learning on the job. Bulletin of the Technical Committee on Learning Technology (IEEE TCLT Bulletin), 15(3), 1-4.

[18] Volksschulamt Zürich (2013): Einleitung zum Medien und ICT-Konzept. http://ict-guide.edu-ict.zh.ch/1-einleitung-zum-medien-und-ict-konzept. Bildungsdirektion, Fachstelle Bildung & ICT. Abgerufen am 16.09.2013.