
PIIK, A COLLABORATIVE NEWS FILTERING SYSTEM FOR AN ELEARNING COMMUNITY IN HIGHER EDUCATION

Platteaux Hervé, Hoein Sergio, Monnard Jacques, Jimenez François and Collaud Gérald

Centre NTE - University of Fribourg, Switzerland

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Problematic

At the present time, offices in charge of developing elearning solutions in Higher Education are facing a problem in their activity of techno-pedagogical watch. There are (too) many sources of information concerning elearning and staying aware of the actuality in this field requires an investment in time that it is less and less possible. We need to regularly follow tens of podcasts or videocasts, hundreds of blogs and as many Web sites, without counting the scientific publications and the emails coming from mailing lists and newsletters. As it is difficult to distinguish what is important of what is not in such a mass, a number of articles or tools which could be essential to improve further web applications for learning and teaching are unfortunately ignored.

The aim of this article is to explain how a web based social networking system could be conceived to support a techno-pedagogical watch done through an information sharing activity made in communities of Higher Education. The aim of our project is to build up an innovative service, called piik, based on social links, between the members of a community, and on their relevance for information filtering and ranking.

We think this way to make an innovative use of emerging technologies and to create added-value for learning applications because this fundamental principle and the originality of our project result from the mixture of two Web 2.0 tendencies in a single tool for information discrimination.

There are on the one hand social networks such as mySpace (myspace.com), facebook (facebook.com) or friendster (friendster.com). These networks are based on the need of the users who wish to learn together by being connected and exchanging information.

On the other hand, there are "social news websites" where no leaders-writers decide which information will be proposed but where the reader-users have this role allowed by a voting system, sometimes moderated by data-processing algorithms. Most known is probably digg (digg.com), but there are other ones such as reddit (reddit.com) and newsvine (newsvine.com) in English, or tapemoui (tapemoui.com) or fuzz (fuzz.fr) in French.

A research in the literature, on the functions of the collaboration tools in social networking systems, was carried out to identify the factors which can intervene during the use of the most current functionalities of social networking tools. We also made an exploration of existing social networking systems to look at the different ways their interactive functions are implemented. A third action was telephonic interviews of the Swiss Educational Technology Assembly members. The interviews were made to question members about factors and implementations identified through the previous two actions. This young elearning community, created in 2008 for Higher Education Schools in Switzerland and centred on competence centres, was identified as a good potential user of piik. With these three actions, our research fed the reflexion about the functions' choice and usability of piik.

A literature review about usages' principles of social networking systems

A paradox as a core principle

The actual trend of social networking systems is well described by Mica (2005, p. 212): "The latest breed of social networking services combines social networks with the sharing of content such as bookmarks, documents, photos, reviews. The idea of network knowledge sharing is based on the sociological theory that social interaction creates similarity and vice versa, interaction creates similarity (friends are likely to have acquired or develop similar interests)."

Then a paradox appears, from the literature review, in the core principle of social networking systems. In order to avoid an overflow and a lassitude of people in front of too much information and people, there is a need to develop a tool specific to one community (Millen et al., 2007). In particular, people have a big interest for other people having the same job or activity (Millen et al., 2007). This makes sense easily because it means that other people who do the same job can become "friends" very naturally. But the system effectiveness increases when it is possible to have a glance outside our usual friends (Yu et al., 2003). This is the sociological weak link hypothesis (Granovetter 1973) which states that connections between dissimilar individuals are important in creating cross-community links.

A tool-service for what uses?

Two principal activities appear in the scientists' analysis of social networking systems. "Browsing" is one main use of them. People navigate in the links and documents suggested by the community and vote in favour or not of these items. They navigate also in the profiles and votes of the other community members. The "browsing" makes possible to profile people and information (Millen et al., 2007). The other main activity is "tagging" where people make suggestion of documents or links to the community, associated with a series of keywords or tags. This allows the diffusion of information and/or the management of the group (Thom et al., 2008).

Doing this, social networking users have three principal purposes. First they want to find people for projects and to discuss questions. They apply different criteria for this "matchmaking" (Kolvenbach et al., 2005), aimed at finding "friends" in the community. Second, people are convinced that, with social networking systems, they will find more quickly relevant and valid information: "People trust the information because of a trusted community" (Millen et al., 2007, p. 31). Considering we are living the age of information, we see here how people and information are tightly linked in social networking systems. And this explains also why, as a third main purpose, people want to be part of communities of "colleagues", to make a watch of a common field (Millen et al., 2007).

How to make the tool-service work

The main actions and purposes we just described imply a fundamental statement for the conception of social networking systems. The navigation principle of such a web service must be based directly on the links between the members of the community (Mika, 2005; Kolvenbach et al., 2005). Furthermore, in order to allow a quick and easy finding of friends in a community, navigation must rest on a visualization which connects the people, their actions and the topics approached by the community (Xiong and Donath, 1999; Heer and Boyd, 2005; Laraqui, 2007). When the number of links (people and information) becomes too big, the services are based on the idea of a reduction (Laraqui, 2007), that means often the organization of more independent sub-groups.

Then visualization and readability of different profiles of individuals, sub-groups and entire community are essential to social networking systems (Xiong and Donath, 1999). Metaphors are developed to represent the connections between community members, actions and topics. Xiong and Donath (1999) represent people as flowers and groups as gardens. Their shapes show their implication levels and attitudes (more proposing or answering), relative to actions, which evolve over the time. Heer and Boyd (2005) present social networks as concept maps with a classical representation of nodes and links. Mika builds a representation directly on topics and interest of people for them (2005, p. 216): "The concepts of this ontology are research topics, while the associations between the topics are based on the number of researchers who have an interest in the given pair of topics [...] This ontology reflects the specific conceptualizations of the community that was used in the extraction

process (see the following Section). Also, the ontology naturally evolves as the relationships between research topics changes".

As a consequence, another fundamental of social networking systems is their awareness function, both for the profiling of persons and for the profiling of information, as we saw above. Such systems support collaborations because the Web environment is enriched with person data to enable a participant to make a judgement concerning the relevance of the person (their knowledge, skills, etc.) to the attainment of their goals" (Danis, 2000). When linking profiles about people and information, confidentiality becomes also crucial (Acquisti and Gross, 2006).

Exploration of existing tools

We explored the various functions and actions which piik could propose through an exploration of existing tools such as Digg, FeedSeed, Findory, Friendfeed, Janiix, Mionews, Noiseriver, Orkut, Pligg, Profilactic, Readburner, Redit, Secondbrain, Spokeo, Stumbleupon, etc.

Through the analysis of these various tools, we identified real innovations to be developed with piik and explored various possibilities of realization. For example, piik could be created: ex-novo, by using APIs (Programming Application Interfaces) of various tools, as an endemic development of one or more functionalities within an existing tool, as a social network in one or more existing tools, etc. Also the understanding of processes, connected to the set up of important functions, allowed us to aim at a simplification of the actions of the user.

Two principal ideas came out from this analysis and first a paradox. There is often a tool, a software or Web-service, which allows a function of piik. But it does not meet the specific needs of the Swiss Educational Technology Community. None of the explored tools gathers all the piik functions or it does not work on the principle brought by piik: the classification of the news according to the degree of affinity between the people of the community.

Furthermore, choosing an existing service would imply that the information exchanged by the Swiss Educational Technology is placed on a server not controlled by Swiss high schools (problem of confidentiality, evolution, sustainability, etc.).

Interviews of the community members

On the basis of the literature review and existing systems exploration, a list of precise questions was formalized to be discussed with members of the Swiss Educational Technology Assembly in order to evaluate their acceptance (Tricot et al., 2003) of the piik service. In particular, we were interested about the following topics:

- their purposes when using the piik service;
- the types of information they would be interested in;
- how they would like to feed piik with information;
- how they would like to consult information in piik;
- how they estimate their future use of piik.

We used these questions as a discussion thread for telephone conversations which took place in September 2008 with ten members of the Swiss Educational Technology Assembly who are coming from the three principal linguistic areas of Switzerland and eight institutions represented in this Community.

Purposes of use

A great interest for the tool was expressed and the three principal purposes were seen as very important.

In particular, for the techno-pedagogical watch, many of the interviewees stressed out that their task of search for information is important (in quantity and quality) and that a very simple function for sharing the information "pearls" which they found would be very interesting.

The interviewees were also interested in the identification of specialists (links between people and competences) within piik, as a complement of the meetings of the Swiss Educational Technology Assembly.

Educational Technology members were interested in the presence of an animator for the piik service. This person would dynamize the service at its beginning, motivate people to be active in the piik service, make comments on a resource and/or short introductions of resources.

Wished contents

People do not want piik to propose them a simple list of blogs and websites, even if about elearning, but rather a list of precise contents, for example a precise web page or a blog article. This would allow them a fast navigation towards the complete information, if they are interested in. This implies also a need for a link towards complete original information (outwards of piik).

People want information in multimedia format along with traditional text. To read video or audio files, the majority of the interviewees would use the multimedia "players" of their personal computer or the one of the original sources of information.

The majority does not want to publish contents directly in piik. Interviewees said that most of the time information would be already published elsewhere (blog of a project, Web site of an institution, etc). A few, however, consider this option interesting for contents related specifically to the Swiss Educational Technology Assembly.

How to feed piik with information

Several aspects of add-on must be considered to simplify feeding and to match with different users' preferences:

- The add-on (piik button in usual web browsers) is largely preferred compared to a manual feed via a piik web page form;
- The add-on should have two functions: a simple click on a single "interesting" button to quickly feed the news list and the possibility of adding meta-data to the news, especially tags (but also comments and/or descriptions) via a form (for example in a pop-up);
- It should be possible to manage the meta-data at two moments: during navigation and afterwards.

Consultation of information in piik

The privileged consultation that interviewees would do is to access the filtered list of news. This demand focuses the piik service on information contents, rather than on social linking, and on the possibility of a very simple content feeding routine. Interviewees also detailed some implementation aspects of this function:

- Preferred format: information title + a few lines of content + link to original source;
- Some people are interested in other presentation formats (like tags and comments, lists from various sub-groups of friends, etc.);
- The system should not show to a community member the news that she/he imported her/himself;
- The consultation of news proposed by piik should be possible in the usual environment of a community member (mailing list, RSS feed, embedding, etc.).

Second in importance for interviewees comes the possibility to have a tool to visualise the community network. A great interest was shown for the possibility to see the network through several criteria (vision calculated automatically by the tool, vision according to a manual and personal adaptation, vision according to special interest groups) and in a graphical format.

The expressed opinions varied concerning the need for confidentiality for the lists of "friends" which are created by piik to filter information (cf. next article section). The community members were hesitating between the use of their own name or of a nickname.

Scenario of usage and main functions of our social networking system

As a result of the literature review and the Swiss Educational Technology Assembly member interviews, piik should be an efficient techno-pedagogical watch service if organised as a news feeder based on the principle of affinities between the community members. With affinity we mean a kind of friendship described by Mika (2005, p. 212): "friends are likely to have acquired or develop similar interests". Then the basic mechanism of this social filtering consists in creating, for each user, a ranking of the members of the social network to serve as a basis for ranking the news. The news feeder list first shows the news coming from my "first best friend", then the ones coming from my "second best friend", and so on.

This mechanism focuses the main attention of a piik user to news that should be the most interesting for him as they come from people with the highest level of affinity with him. As one of the interviewees said:

"What did the people of my network, having similar interests than me, created, read or discovered recently?"

On the other side, the news list remains open, giving access to all the news posted by all the community members. The user can therefore adapt his reading choice, depending on his available time. If one has little time, only first items, the most relevant, are consulted. When having more time, one can explore the items at the bottom of the list, allowing discoveries outside the usual circle of friends.

A workflow of piik could be the following:

1. I connect myself to access the list of news.
2. Piik proposes all the articles posted lately, ranked according to my affinity with community members.
3. I can vote for some of them (by clicking on a button, plus a possibility of filling out a form with metadata).
4. Other users are doing the same two actions.
5. Piik makes a ranking of the people who submitted or voted for the same resources.
6. The system updates the news list according to the new ranking.
7. This ranking continuous to evolve/move automatically, according to the votes and the new articles (but I can also change it manually).
8. In other moments, during my web navigation, I feed piik with new resources I find interesting for the community by using the piik add-on button installed in my usual browser (or via the piik web page form).

Conclusions

The heart of the piik techno-pedagogical watch service is clearly defined for the Swiss Educational Technology Assembly. The members spend much time searching information about elearning. These news readers are therefore very interested by a system allowing them easily:

- to access a list of news filtered or ranked according to people having similar jobs and professional interests;
- and to feed the news list also (with a very simple web browser add-on).

The piik system should support an adaptable techno-pedagogical watch in a context where a large diversity exists. Different higher education institutions (different resources, equipments, goals, politics, etc.), educational technology jobs (computer and education scientists) and service tasks (tool development, evaluation, project support, etc.) serve different learning situations and settings (teachers and students, hybrid modality courses). By adapting the news ranking to affinities between people, piik is meant to adapt the techno-pedagogical watch to the users and not the contrary.

To increase the innovation level brought by piik, a further investigation should be made on how to mix social affinity and tags in a single news ranking tool. We assumed that applying a social filtering is powerful to improve efficiency of a news ranking system. But questions remain and will be studied further. What degree of similarity of

jobs and tasks must be reached so that, for example, two education scientists have a high affinity level? Furthermore, how can tags, a well known filtering tool, be integrated to support and empower the natural social filtering?

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