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Abstract- **The Social Web Cockpit integrates different services that have been developed in the Social Web research programme at GMD-FIT to support a knowledge sharing community. This includes a web-search based on recommendations, a concept index to develop a community vocabulary, shared workspaces for knowledge sharing, and an awareness service**.

I. INTRODCUTION

CSCW research yielded a number of groupware systems for the support of cooperative work such a shared document-spaces or workspaces, shared applications, and workflow systems. These applications support primarily work or knowledge sharing processes that are pre-planned or that involve well-defined, closed, or small groups of people. This paper describes systems that aim at the support of knowledge sharing within larger and more loosely coupled groups of people that share a common interest, i.e. knowledge sharing communities. The presented systems originate from our "Social Web Research Program" at GMD-FIT which aims to explore and demonstrate how we can turn information environments into rich communication and interaction environments. These are:

- BSCW, a Web-based shared workspace system [1];
- Nessie, an application-independent awareness infrastructure [2];
- Concept Index, a system for concept-based indexing of Web documents [3];
- LiveMarks, a system of information processing software agents running on our agent platform SoaP [4].

We have developed a service, called the "Social Web Cockpit", or "cockpit" for short, that integrates these service and that turns Web sites into meeting places where visitors may become aware of each other, open communication channels, and exchange information and knowledge with each other or with experts. Usually people visit a Web site in search of some information. So there is some chance that its visitors may have overlapping interests, if the site matches their expectations, backgrounds, or motivations. These persons might well profit from each other's knowledge by sharing opinions or experiences or offering advice. Some visitors might enter long term relationships and eventually evolve a community – if only they became aware of each other. Similar functions are provided by systems such as CoBrow [5] or ThirdVoice. The Social Web Cockpit goes beyond that. Visitors may enrich the web site with their knowledge by recommending pages and related links, by annotating and discussing them. People may add their own documents in a shared workspace, they may highlight key phrases and develop their special terminology. These concepts and terms are automatically cross-referenced with the site and related pages to support content-based navigation. Search facilities take into account concepts and collaborative ratings. Visitors may select pages from the site to be monitored for changes that will be indicated upon their next visit.

We expect that web-sites that are augmented with the cockpit and the Social Web Services may become very attractive for knowledge sharing communities because they offer the chance to meet again, to see what is new, and to inspect the growing number of contributions by its visitors. Eventually, the visitors may consider themselves as a virtual community that is held together by their common interests and this special place for meeting and trading information and knowledge.

Many Web sites would benefit from added community support: commercial sites that want to attract visitors, sites of professional organizations, self-help groups, clearing houses, digital libraries, project portals. Nowadays, however, community support is mostly restricted to chat, annotation and rating facilities, discussion forums, or forms to submit new links. The combination of a powerful shared workspace system, a collaborative recommendation service, a community vocabulary for knowledge organization, and a notification service, as offered in our Social Web cockpit, is unique.

II. COCKPIT SERVICES

The cockpit is a small window that occupies only little space on screen; all actions and controls can be dragged out in separate tiny windows. Therefore, most users don't need to reorganize their desktop when using the cockpit (see figure 1). After the cockpit has been launched and when a web-page is visited, a user becomes immediately aware of other visitors and the communities at the site. A cockpit is a place for social encounters so users can get in contact with each other using different communication tools. A chronology of community visits supplies further details about the distribution of visits over the last hours, days, or month. This helps users to decide on the best time for visiting a community.

The Social Web Cockpit uses BSCW to enable cooperation over the Web. BSCW (Basic Support for Cooperative Work) is a shared workspace system which supports document upload, event notification, group management, discussion forums, meetings, and
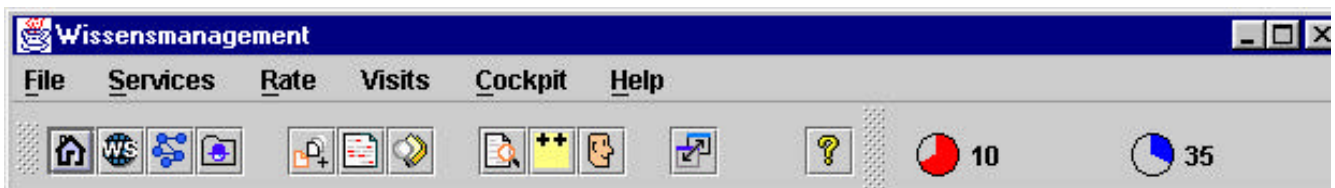

Figure 1: Cockpit User Interface

much more. In the context of the Social Web Cockpit a community is a group of people sharing similar interests and tasks. In our approach, the documents which the community collects and produces are the main carrier of knowledge. Community knowledge is stored in BSCW shared workspaces. Creation of communities and community membership is implemented by BSCW functions.

Users can rate the current page on a scale of 5 (poor, passable, fair, good, excellent). This personal rating is sent to the BSCW system, where it is added to other ratings of the page within the present community. The (changed) median of all ratings is returned to the cockpit and displayed using the corresponding icon. Ratings are used in LiveMarks to help users to retrieve useful information from the Web.

The Cockpit uses the NESSIE awareness infrastructure to turn web sites into meeting places. Members of a community become aware of each other and get in touch. While visiting web pages, users get informed about the community to which the web page belongs. The median of all ratings of a web page - made by members of the community - is also shown. Users can easily contact experts of this community. Awareness information is visualized by different indicators; for example, changes of icons, detailed listings of present members in a specific community, etc.

Members of a community may easily start an agent which monitors web pages. The monitoring agent adjusts to the users' preferences: the user may specify what web page should be monitored, for what keywords and at what dates and in what frequency this should be done. Users are notified of changes in a web page by a little yellow asterisk in the monitor icon.

The Social Web Cockpit uses the ConceptIndex system to enable members of a community to construct their own shared vocabulary. This vocabulary captures characteristic words and phrases; an index based on this vocabulary cross-references all web pages of this community. Web pages may be viewed with the community vocabulary; phrases in the web page are highlighted and links to the index are provided. A word or phrase can easily be added to the vocabulary. The index with all the cross-references is automatically updated.

The Cockpit uses a recommender system, which enables members of a community to share queries and to collaboratively retrieve and collect useful web pages. While a member of a community submits a query to a search engine, software agents in the background look for similar queries of the community with related and recommended web pages. The result of the search is a mixture of web pages originating from the recommender database and pages coming from the search engine. When the member recommends such a web pages (by rating it good or excellent), the page is put into the link collection of this community.

III. SUMMARY AND FURTHER WORK

Different services developed by the Social Web Research Programm are combined to provide a comprehensive set of services for a knowledge sharing community. This includes a web-search based on recommendations, a concept index to develop a community vocabulary, shared workspaces for information exchange, and an awareness service. We believe that the extension of a web-site with these services will foster the community building process because it enables a web-site to become a meeting place for a knowledge sharing community.

More information on the Social Web research programme, the Cockpit, and the other projects can be found at: http://orgwis.gmd.de/projects/SocialWeb/.

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