Community Support in Universities – The Drehscheibe Project

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Abstract. Community support systems (community platforms) that are providing a rich communication medium for work or interest groups are gaining more and more attention in application areas ranging from leisure support and customer support to knowledge management. One of these application areas is the support of teaching and research activities in universities. In this article we present a community support system we have been developing and using for seven years in different university departments. In contrast to other work on community support for universities the system does not focus on lecture support or on knowledge management alone, but provides a generic communication and matchmaking medium. We will present the basic functionality of the system and elaborate into some observations we have made in the usage period.

1 Introduction

Several types of applications currently advertise their contribution to "community support". Using this label Web platforms and electronic commerce systems are equipped with annotation functionality (social navigation) and various communication features.

In general, community support includes all methods for supporting communication and coordination in a group of people. It includes support for direct communication, support for indirect information exchange and support for matchmaking. Community support is closely related to the application areas of knowledge management, customer relationship management and change manage-

ment since these also deal mainly with support for communication in loosely coupled groups of people.

Using networked computers for supporting communities can be tracked back into the beginnings of the Internet. But only in the recent years integrated (Web-based) community platforms have found broad attention in research and development.

Such platforms are already in use in several different application areas. In the university domain communities like the students attending one course, the staff and the students belonging to one department or the alumni of a school can be found. The single communities can profit from the extended communication medium a community platform provides or can become a community with the help of such a platform (for example the alumni of a department that does not provide a special alumni program or alumni reunions – as it is the case for most European universities).

Most existing work on community support in the university domain focuses on supporting learning communities and on support for knowledge management in (world-wide) special interest groups. In this paper we will present a community support system that focuses on basic communication and matchmaking support in one university (or department). The system is under development and in use for seven years now and has developed significantly during this time.

After a short introduction to the topics of community and community support (Section 2) we discuss the possible usage areas of community platforms in universities (Section 3). Then we present the history and the current status of the Drehscheibe system (Section 4). In Section 5 we present some observations from the (constant) introduction and operation of the system and briefly discuss them. Finally, we will present some ongoing developments in the context of the support platform (Section 6).

2 Community Support

2.1 Communities

In general a community is a group of people who share some interest, identify with a common idea or more generally belong to a common context. Thus, a community can be seen as a descriptive identity for a set of people.

Early sociological work points out that communities always need a locality and interaction (Hillery 1955). While the demand for a common physical locality is no longer seen necessary, the demand for interaction is still valid. However, no active interaction among all community members is required but rather the possibility to interact with the rest of the community. In more practical terms this possibility to interact implies the existence of a common communication medium,

of common protocols and awareness of the existence and of the membership in the community.

Another characterization is that communities are based on the will to exchange knowledge. Ishida (1998) summarizes this in the following quote: "*In a community, people want to know what the others know.*" This issue can be extended to the request for collaboration in a community. A community is not just a set of people who have something in common and who have the possibility to communicate, but of people who are willing to help each other, who are collaborating to the advantage of all.

To summarize so far, a community is characterized by

- a boundary (common interest, common idea, common context),
- a sense of membership,
- ongoing interaction, and
- collaboration, mutual support.

Besides the collaboration among the members itself, the main activities in communities are communication and finding people to communicate with. Hence, community support can be seen as "*communication and matchmaking support*".

2.2 Community Support

The use of networked computers to support communities can be traced back to the beginnings of the Internet: The second service in the initial Internet, the file transfer service was soon "misused" to transfer messages from one person to another – email was invented (Hafner & Lyon 1996). Quickly mailing lists followed and Newsgroup services were available – both on the Internet (Arpanet) and on alternative networks formed of loosely connected computers (e.g. FidoNet). The first community support services of the Internet still exist. Additionally, different (Web-based) platforms emerged, that provide virtual places for communities. Such solutions are labelled as platforms for community support (community platforms) or as community support systems.

However, community support did not start with computers. Support for the building and the maintaining of communities can be classified in classical approaches like private letters, leaflets, magazines, paper whiteboards, specialized radio and TV programs, and approaches based on networked computers (bulletin board systems, MUDs, MOOs, "community networks" (Schuler 1994)).

Both support types, the classical and the electronic ones, provide a medium that can be used for the interaction among the members. And both have their advantages and disadvantages. For classic media the advantages are availability, familiarity, and ease of use. For electronic media the advantages are dynamicity, speed, ease of replication, and distribution; disadvantages are barriers to usage, problems with access, and lack of availability.

When introducing community support systems one also should mention the terms “local community” and „virtual community“. Local communities are groups of people who have their roots in the real world, meet face-to-face regularly, and use electronic information systems only as an add-on to improve their reachability. Virtual communities are groups of people who would not otherwise form a community without the assistance of electronic media. The members of a virtual community only or at least mainly communicate through electronic communication channels. Computer mediated communication is an enabler for the virtual community. In contrast to local communities, this situation offers new possibilities and dangers of anonymity. In most cases however, the virtual communication is enhanced with physical meetings. Even in communities that began as pure virtual communities the members tend to ask for and arrange physical meetings.

Generalizing the functionalities of different electronic community support tools and matching them with the basic characterization of communities presented in the previous section one can identify the following basic concepts of community support applications:

- Providing a medium for direct communication and for indirect exchange of comments on objects within the common scope of the community. The information channel can be enhanced with features that use information about the community member to do (semi-)automatic filtering and personalization (Riecken 2000, Schubert & Koch 2002).
- Providing awareness of other members and helping to discover relationships (medium for matchmaking). This can help to find possible cooperation partners for direct interaction.

3 Community Support at Universities

At universities different possibilities for the application of community support systems can be identified in the research, teaching and in student and alumni domains.

3.1 Community support systems for teaching

The set of all participants of a course can be seen as a community. The community is clearly defined (e.g. by explicit enrolment), the members have common interests and some kind of cooperation (learning about the topic of the course), and there is an ongoing interaction (in the course and in assignments). A community support system could support the students and the lecturer in exchanging organizational information like general announcements or announcements of date or room changes. In addition the system could provide a platform for collaboration and direct communication. Course material could be provided

on the platform and discussion forums could provide the possibility to continue exchanging about the contents of the course even away from the regular meetings.

Different work already addresses these possibilities under the labels of e-learning or computer-supported collaborative learning (CSCL). One example for a community support system that is used for this purpose is the CommSy system (Gumm et al. 2000, Bleek et al. 2000). Other systems used for supporting course communities are WebBoard (www.webboard.com) or BSCW (www.orbiteam.de). The problem with these systems often is, that they are specialized to e-learning or work group support and do not provide an open enough medium for supporting other community needs at universities.

3.2 Community support systems in departments and research groups

Community support systems could help to support the information flow in university departments. This includes the exchange of information about lectures and course programs, announcements and events, the discussion of course- and department related questions and the knowledge management in the department and in research groups.

Knowledge management is a broad application area for community support systems. The reason therefore is, that knowledge usually is hard to externalise. So finding experts and the direct interaction among people plays an important role in transferring knowledge (Borghoff & Pareschi 1998). Community platforms offer possibilities to collect information from the members and keep the link of information to its publishers. Examples for information (items) on a departmental platform would be literature references, bookmarks, and information about projects, persons or organizations. Additionally, the possibility to publish annotations and the possibility to use user-specific categorizations (personal folders) could be introduced.

In contrast to enterprises, at universities knowledge management cannot be limited to the own organization. In the scientific area it is important to exchange knowledge with researchers at other universities and research institutions and in enterprises. An example for a platform providing support for such cross-organizational communities of practice in research is the NetAcademy platform (Wittig 1999, Seufert & Gerhard 2000).

Examples for systems in the area of departmental information systems are content management applications with a portal front-end or university specific “integration solutions” like the product from Campus Pipeline (www.campuspipeline.com) or the UnivIS application (www.config.de/UnivIS/). These systems can be very useful for students and faculty, but do not exploit the full potential of community support in the university domain. There is a need to provide a more generic medium that can also be used for student and alumni communication.

3.3 Community support systems for student communication

The communication among students is an important part of academic life at universities. Since not all universities have a compact campus, regular meeting of students by chance is not always guaranteed. Community support systems could support the bridging of such spatial distances. One application would be finding partners for learning and working groups. Another example would be support of communication and matchmaking in the leisure area.

A special add-on for students would be the integration of partners from outside the university (alumni or companies) on the platform. This could motivate and support the communication between students and companies. Possible scenarios include be the installation of a market place for student jobs or a market place for ideas.

In praxis this task is currently supported by generic community support systems like UsenetNews or mailing lists. These tools offer an open medium for community interaction but they are not easy to integrate in emerging portals or other platforms.

3.4 Community support systems for alumni

Several European universities started to integrate their alumni in the university network recently. Central institutions are founded that maintain alumni databases and that organize common events to foster the communication among alumni and of alumni with the university members (faculty and students).

Community support systems could help to create a common identity of all alumni of a university and thereby create an alumni community. A communication platform for alumni could support both the information flow among university and alumni and among the alumni. The set of alumni of a university thereby gets a more graspable form and is more easily addressable for university members and for students.

Existing platforms for supporting alumni interaction mainly provide address lists and bulletin boards for the alumni. However, there is no integration with the systems for active students or for the department.

4 The Drehscheibe Project

Most of the existing community support platforms in universities address the areas of supporting learning communities or of supporting research groups in information or knowledge exchange. In contrast to this our project focussed on providing a generic medium for supporting communication and matchmaking in universities, in particular for students and alumni. The resulting system was labelled *"(Informations)Drehscheibe"* (German for *"(information) turntable"*).

In this section we will present the history, current status and technological solution of the Drehscheibe platform.

4.1 History

In the year 1995 some people in the Department of Informatics (Computer and Information Science) of our university decided that it is time to replace the (always late and never up-to-date) printed version of the course catalogue by an online version. So we started to implement a Web-based course catalogue with functionalities for planning and coordinating future courses (for the faculty) and for maintaining online-timetables (for students and faculty).

The service grew and we soon extended the focus to building a “platform for information exchange and matchmaking” in the department – a community support platform. We identified different target groups. These were students, alumni, faculty and external (future students, external researchers, companies). Regarding the target groups we decided to focus on supporting information exchange, communication and awareness (matchmaking) for students and alumni while providing a very flexible medium that might also support other fields. This task was accomplished in several steps. The system was restructured, was re-implemented and was linked to several other systems and resources. During the development the solution was adapted by other departments and universities and in this turn extended with various possibilities for configuration. In the following subsection we will briefly describe the core functionality of the system as it is in operation today.

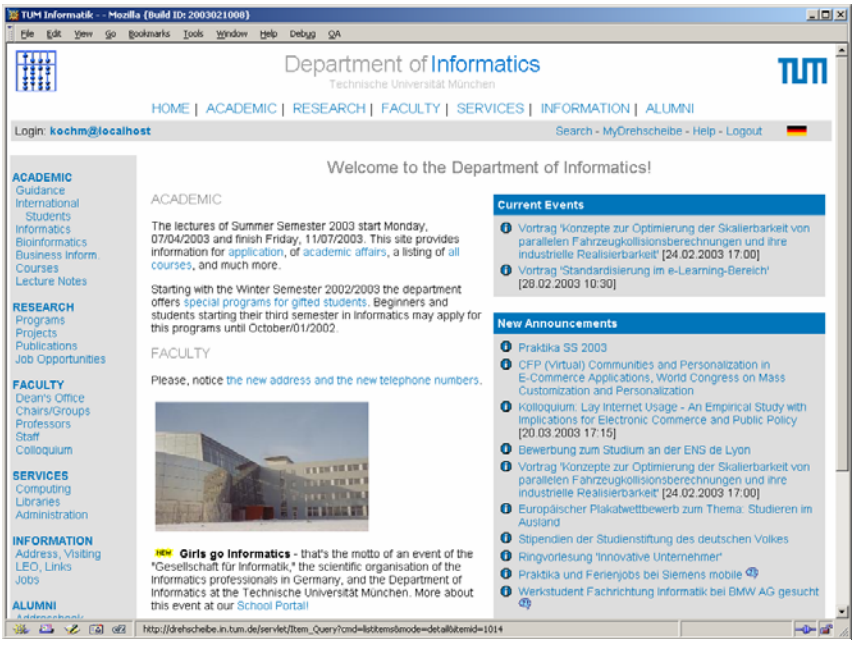

Fig. 1 Homepage of the Department of Informatics of TUM with Drehscheibe functionality

4.2 Functionality

Focussing on communication and awareness (matchmaking) support we began to develop a generic community platform that provides the possibility to easily support different (overlapping) sub-communities in one installation. The members should mainly be supported in exchanging information and comments. To exploit the community and to provide awareness all information should be linked to the publishing user and it should be possible to easily get information about community members.

The platform currently offers the following functionality: 1) Publishing (semi-) structured information, 2) Community spaces, 3) User representation and match-making, 4) Communication and awareness, and 5) Web-content management.

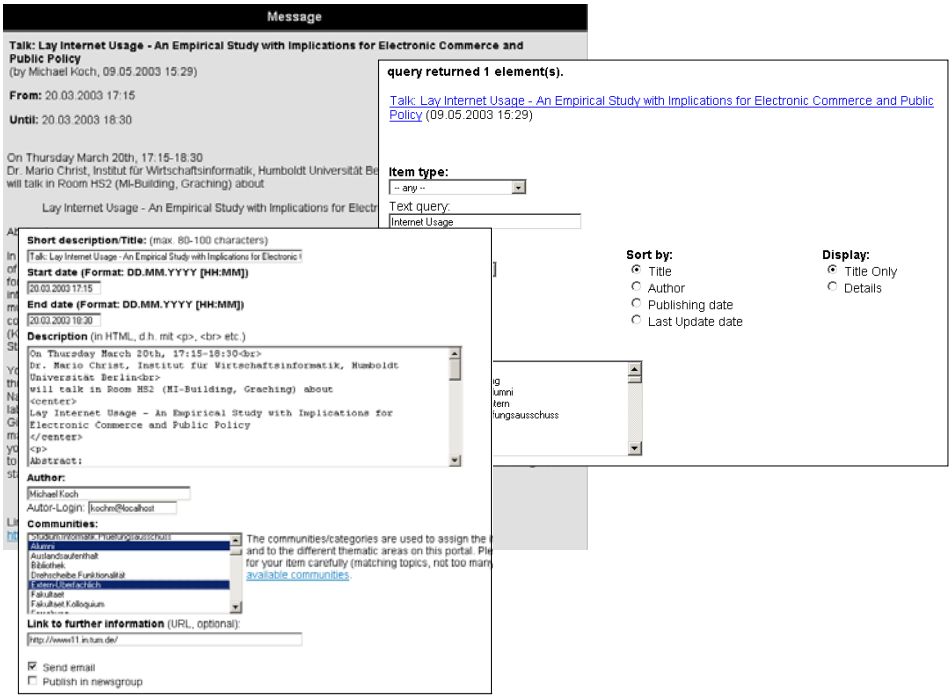

Fig. 2 Item functionality in Drehscheibe (Publish, Search, Display)

Publishing (semi-)structured information

The central part of the system is a simple but very flexible and extensible functionality for publishing and receiving information and comments. The information that can be published ranges from simple free text announcements, semi-structured event announcements (with attributes for timeframe and location) to fully structured data sets like bibliographic references.

To provide this functionality in a very generic way, different information object classes can be defined in a data model. The model is based on a frame

based approach and defines attributes (slots) with types and default values. Object classes can be related to each other in a class hierarchy (is-a-relationship), and attributes can define a instance level relationship to user or course objects. Defining the model can be done using ontology editors (e.g. the Protégé editor), which keeps room open for future extensions of the model. On the departmental platforms we currently provide object classes (and appropriate user interface templates) for announcements, events, bookmarks, project descriptions, research topic descriptions, publications, job offers, and special classes for announcements in the academic programs. Instantiations of these information object classes are called (information) items. Such information items can be created by any registered user of the platform. Items can be rated and it is possible to publish annotations and comments to items.

Selections of the items can be displayed on Web pages of the community information space (see Fig. 1), can be searched by the user or can be sent pro-actively per email according to a user's subscriptions. Such subscriptions can ask for sending new and changed items immediately, once a day, once a week or monthly. A special way to present items that have a duration attached to them (starttime, endtime) is implemented in the calendar component. With this component the items can be displayed in a day, week or month view.

Regular lectures are currently modelled as a special item types. It is possible to publish comments to lectures and to define subscriptions (e.g. for new lectures, changes in time or room). Lecture items can be organized in a timetable. This information about lectures a student is visiting or has visited (timetables are stored for previous terms too) is used for providing recommendations for lectures to visit using collaborative filtering techniques (e.g. like "student who has visited this lecture has also visited that lecture").

Community spaces

To structure the item sets (and the user sets) we have adapted a very flexible community (or category) concept. Every registered user can create a new community space and place it in a hierarchy of already defined community spaces. Such a community space has a name and can have members (association of platform members with the space). If the space is declared "open" every user can decide herself if she wants to become member of the community (space). In closed spaces the administrators of the space have to decide about membership applications or have to invite members explicitly. Items published to the platform can be associated with one or more of the community spaces. Attributes of a community space determine if you have to be a member of the space to associate information items with the space or to read items associated with the space. Additionally, community spaces have a freely editable homepage and any number of static web pages that can be edited by the members of the space.

The community spaces serve several purposes: First they are offering a possibility to flexibly structure the members of the departmental community into several smaller sub-communities. These sub-communities can be used to define access rights to items and thereby to determine who will receive published information. But the sub-communities also carry some information in themselves. The association of users to sub-communities tells something about interests and relationships between users. The interest and membership information is used to define subscriptions for new and changed items. Therefore, the interest relationship is enhanced with a notification rule (immediate, daily, weekly, monthly). The membership relationship aspect can be compared to the well known buddy lists defined on a per-user basis. Since the different members of a sub-community can collaboratively edit this list of members we also refer to the concept as "SharedBuddyLists".

So, the concept of community spaces is much more than simple categorization of items and users (by their interests). Even if only used this way, the implementation provides one very important add-on to existing systems that provide sub-communities like Yahoo! Groups: Since items can be easily associated to more than one community, it is easy to publish information to different communities. In the same way it is easy to collect information from different communities. This aspect is of major importance for the usability of community support systems since people usually interact in more than one community. Existing systems do not support this fact but usually make it hard to deal with different communities at once. Providing the possibility to easily interact in different communities at once makes the support more intuitive to users and thereby serves making the support platform a medium instead of a tool.

User representation and matchmaking

In community support systems the representation of users is even more important than information exchange. Reference to the community members is needed to put an information item into context and to provide possibilities for finding other community members for direct interaction.

We provide a possibility to store different information about a user (static attributes, interest attributes like the relation to community spaces, relationship attributes like buddy lists). Since the information is not only used in the system, the user can specify how this information can be presented to other users (not, everybody, buddy list only). Information about users is presented on user information pages that are linked to all information the user has published. These user information pages also allow to search for all items a user has published.

In addition to finding users from information they published on the platform, it is also possible to search users by their attributes. One case where this functionality is used a lot is the alumni class lists. Especially for alumni we also

provide a notification service for changes in the user data (e.g. address information).

Finally, one important feature that was requested by the users was to add a photograph to the user information and to allow a “search by pictures”. Therefore, we provide pages that show all pictures of students from one semester / class.

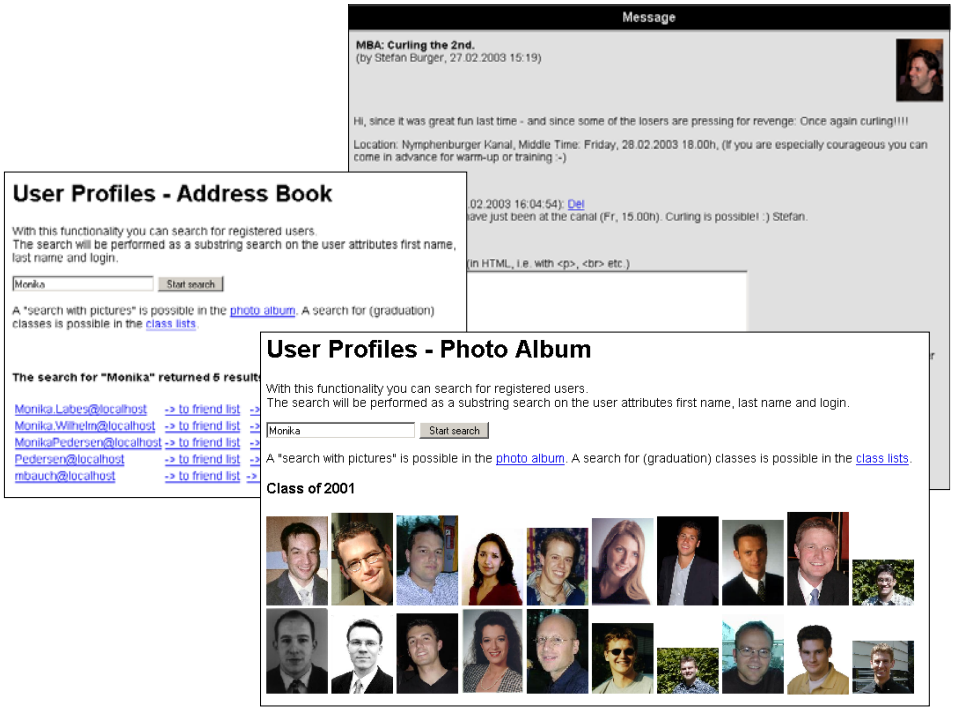

Fig. 3 User lists and User representation with items

Communication and awareness

By adding comments to the semi-structured information items asynchronous communication among the members is possible. The Drehscheibe platform does not provide any further support for direct communication. We assume that the users already use other communication channels (like email or telephone). So, it is enough to provide contact information and awareness of other users. The awareness is provided by displaying lists of (currently active) community members, by prominently showing the author information when displaying information items, and by offering services to search the user database.

User interface, Web-content management

While first the functionality presented in the previous paragraphs was separated from the static information on the departmental Web site, soon the demand raised to combine the static information with the communication and matchmaking functionality (for registered users). Hence, we implemented a small web content

management functionality that provides functionality for defining page templates and for editing Web pages via the browser or for uploading them via FTP or WebDAV. In these Web pages placeholders can be defined that are filled with information from the item, user or community databases. Using this template mechanism it is also possible to provide personalized pages for authenticated users.

4.3 Implementation

During the development we have been experimenting with several technologies and architectures for the implementation of the Drehscheibe service. Before going into more details here we briefly have to sketch the general conditions of the development. Since the project never has been a funded research project, but "just" a good-will infrastructure project, there were no employees assigned to the project. There where just one or two employees from the Informatics department who took managing and implementing the platform as an additional assignment and worked with changing teams of students who did their programming projects on components of the platform.

We have started the project as a PHP application in an Apache Web server with a MySQL backend database. However, this implementation basis was dropped after one and a half years because PHP did not provide enough support for modular development. It became very hard for new students to understand existing code and to extend it. PHP proved to be a good basis for a small, coherent set of developers, but did not match the project conditions we were facing. So, we switched to Java (Servlets, Java Server Pages) as an implementation basis. We are now using Tomcat as an application server and are still relying on a relational database for the backend storage (currently MySQL, Postgres and Oracle are supported). For making it easy for developers to install their own development environment we are using CVS for version control and are providing a Java-ANT-based build script for setting up the system and for starting the application server.

To provide flexibility for adaptation and for interoperability (also see Section 6), we have designed a highly modular set of components for the system. This development was generalized in the project Cobricks (Koch 2000, Koch 2002a, Koch 2002b) and currently serves as implementation basis for several community support platforms in our group (Koch et al. 2001, Koch et al. 2002, Reichwald et al. 2002). Basis of the system design for Cobricks platforms is a classical separation of user interface, backend services and database access.

Backend Services

For the backend services we have identified different components and have implemented them separately. The separation of the components is mainly guided by the different data concepts available in the platform:

- Content and feedback management
- User (profile) management
- Message management (including newsletters)
- Community management
- (Web-)Page management
- Course management
- Timetable management

The backend services provide their functionality via (remote) procedure call to the user interface layer.

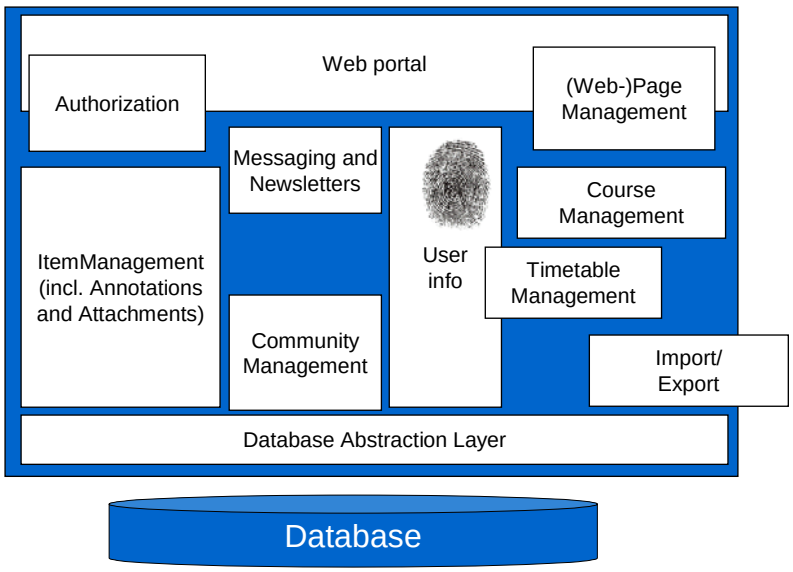

Fig. 4 Cobricks system architecture

(Web-)User Interface

The user interface provide access to the backend services and implement the "real" community services. For the Web-based user interface we are using a template based Java Servlet solution which is quite similar to Java Server Pages – i.e. the functionalities are implemented in servlets but rely on template files that consist of HTML text with placeholders for data. Those placeholders can refer to attributes of specific data sets or to functions that return some content. Content returned by functions usually is XML and is transformed to HTML using XSLT stylesheets. With this solution it is very easy to customize the user interface.

In addition to the Web-based user interface we also provide a Web-Services interface to the backend services that can be used by user agents or by external tools.

5 Drehscheibe – Usage Experiences

Because of the possibility to flexibly support sub-communities at the grassroots level and the flexibility in design and organization of the information space, a single installation of the platform could theoretically cover all applications in the whole university. However, this approach (one central platform for all) according to the experiences of the author leads to resistance from the responsible persons in the different departments. It is seen as restriction of their own individuality and freedom – especially in German universities.

So in the moment we already have two instances of Drehscheibe operating at our university – one for the Department of Informatics where the system was designed and developed, and one for the Business School (Department of Economics). More installations are already planned in other departments and research groups. A third installation is currently in use in the Department of Informatics of a neighbour university.

In the remainder of this section we will present some observations from the actual usage of the system. Since we have never done a real usage study, but just peripheral observation, we mainly present some distillations from these observations and some lessons we have learnt, but do not support them with numbers. A full study of the user activity in the different instances of the system will follow in the future.

Active students - passive students

The usage of the two Drehscheibe instances in our university is quite different. While in the Informatics Department the platform is mainly used to distribute announcements from the department, some external sources, and from the faculty to the students, in the Economics Department the platform is mainly used for communication among students. So, with the same set of functionalities different usage patterns have developed.

One reason for the different developments could be the different composition of the students and the spatial distribution of the students. While in the Informatics Department there are mainly students in their first course of study, in the Economics Department there have been older students that already have finished a full course of study and are now doing a MBA. In addition to the difference in age and experience the two groups differ by the spatial distribution. While most lectures for Informatics students are in one area of the campus, the MBA lectures (and therefore the students) are distributed over large areas of Munich.

Another reason for the different development could be the different technology already in use by the students of the different departments. The Informatics students already have some established community platforms in place: UsenetNews and IRC. A qualitative survey showed that these media are much

more actively used by students than the departmental communication platform. Additionally, the student groups in the Informatics department share the "engineering position" that only a system developed by oneself is a good system, and therefore still develop and use their own mailing list and portal based platforms for distributing information. The Economics students did not have communication channels in place and are less driven to implementing own systems. The only tool that is in use by a high percentage of Economist students is Instant Messaging. Examining the influence of this to the usage of the departmental platform will be one of the goals of a future study of the system. We are also starting to implement bridges from and into different media (particularly UsenetNews).

Finally, we consider the "ownership" of the platform as one possible reason for different or low student activity. In the Informatics Department the platform was always maintained by staff from the department. In the Economics Department the platform was set up as a result of a student project and was maintained by students for a long time.

Usage of existing features

Another result we can present from the operation of the platforms over several years are patterns in the usage of the provided features and requests for new features. For making the platform an integrated support medium instead of an isolated support tool we introduced different functionalities. The core functionalities were the flexible usage of sub-communities at grassroots level and the awareness features.

When enabling the sub-community functionality we provided the platform with an initial set of thirty communities covering topics from academic programs, exams to leisure activities. While we imagined that users will make intensive use of creating additional sub-communities, we observed, that there were only few new communities created during the last years. Examples for new communities were communities dedicated to the exchange around particular lectures or new academic programs. Users did not create other general-purpose communities – but there was feedback to the administrators of the platform about the usefulness of existing communities and some changes were made according to this feedback. Asked about why they did not create communities themselves, users mainly responded that they did not know/feel that they were supposed to "change the structure of the system". Because of these results we improved documentation of the functionalities and started a small campaign to convince users that they are allowed and even supposed to help structuring the departmental community support system to their needs. This campaign is still in progress, but already shows some positive results – however very slowly.

While the feature of creating new communities did not attract the expected attention, the users very much appreciated the easiness of interacting in different

communities. The importance of interoperability among communities and tools was also highlighted by the users indicating the email notification and newsletter service as a key feature of the platform. But there were also some problems with this. We had to fight two developments: 1) Some users felt, that their information has to reach all other users and published it in all available public communities (because it was so easy); 2) Other users thought that they just have to publish information on the platform, without having to specify any communities. These developments of neglecting categorization schemes can also be found in the application of knowledge management tools.

The awareness functionality was quickly accepted by the users as a possibility to identify other users and to get in touch with them. They even proposed additional functionality to support searching in the user database (see next subsection).

Around user lists we also discovered an "abuse" of a functionality implemented for alumni. So we provide an attribute in the user profiles that is labelled "year of graduation" and have built some features for displaying class lists and for subscribing to notifications about address changes of members of the same class. While meant for alumni only, we soon found entries of future years in this attribute. Active students have started to use this field to register their predicted year of graduation to provide information about their current status. This is especially interesting since the students in the department do not form a real class (there are 500 to 1000 students beginning in the same year) and usually are not finishing after the same time.

Requested features

Features requested by the students first where the possibility to add file attachments to items. The students wanted to share lecture notes and other larger documents this way. Another feature related to the attachment feature was the possibility to have virtual team rooms for document exchange. We experimentally installed a BSCW server in addition to the Drehscheibe service to provide this functionality in the Economics department and found that the students made extensive usage of it.

From the departmental staff the major feature requests were additions to the (Web-)page management and to the content management functionality needed for efficiently managing a multi-language Web-site administrated by different people from different groups.

Finally, there were several requests for providing interoperability with other platforms. Examples are providing a single-sign-on solution with other platforms from the department or from research groups, or exchanging data with UsenetNews.

Expansion

In addition to experiences in the usage of the platform it might be interesting to report some experiences from setting up the platforms and from handling operation and integration.

After some good experiences with the first two platforms we soon extended our plans to include more services from our department and to extend the scope to the whole university. For the latter we planned to set up a new platform called "TUMmelplatz" (German for "romping place") to support communication on a university level. This platform should integrate departmental platforms and act as a forum for all alumni and people interested in the possibilities the university provides. Additionally, we wanted to equip the platform for supporting cross-departmental cooperation.

Both in actively getting more actors from the department into the project, and in setting up a platform on the university level we deeply stumbled into responsibility problems. When different actors where involved that all had their own ideas of what a support platform should be and what not, getting commitment got more and more difficult. And since we were missing explicit support from management most of the efforts failed.

So finally, we stopped trying to expand. We are now focussing on developing interoperability functionality to finally integrate all the different emerging platforms again in one or another way.

6 Summary and Future

In this paper we have presented the Drehscheibe system for supporting communication of students and alumni (with faculty) at universities. In contrast to the (isolated) tool character of some other community support systems at universities we concentrated on providing a communication and matchmaking "medium". The medium aspect mainly shows in the provision of simple but generic features that can be used to support different activities, and in the integration of different communities and with different other media (like email). So, it is not even necessary to directly interact with the platform to make use of it – information can be published and received via email. One of our future tasks will be to further shape the basic building blocks and interfaces for such "ubiquitous" community support platforms (also see Koch (2002c)).

On the feature side we have highlighted the communication and awareness features of our platform. While some of the features developed towards content management functionality we still focus on community aspects of these functions: linking users to content and making publishing possible for all.

We have mentioned, that the natural development is towards different community or service platforms even in one organization. This development leads to some problems:

1) Users have to register explicitly at the different platforms and have to enter their profile information (e.g. the demographic information and interests) again and again.;
2) There is no possibility to automatically publish information on different platforms or to ask for information or news from different platforms.

We are currently addressing these interoperability issues in different projects including work in global identity management (Koch & Wörndl 2001, Koch 2002a, Koch 2002b, Koch 2002c, Koch 2002d, Koch & Möslein 2003).

Finally, we are currently working on extending the Web-user interface to other user interfaces, that can be embedded into non-virtual place. In this context we are experimenting with large screen devices and with mobile devices that provide access to different parts of the Drehscheibe.

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