

COMMUNICATION AND MATCHMAKING SUPPORT FOR PHYSICAL PLACES OF EXCHANGE

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ABSTRACT

Most community support applications currently focus on supporting indirect information exchange instead of facilitating communication or bringing people together. Additionally, researchers and developers tend to look at virtual only support without taking physical face-to-face meetings into consideration. For refocusing on people to people interaction, future community support applications first have to address identity management to present users in the system and to other users, and second have to extend their interfaces into the real world. In this paper we present an interaction design oriented exercise to supporting communities in physical places of exchange. This support for physical meetings might be on possible interface of future virtual community platforms.

KEYWORDS

Interaction design, community support, meeting support, identity management, privacy

1. INTRODUCTION

Starting from early work on computer-supported collaborative work studies, the role and potential of community support recently has gained more and more importance in the development of new applications for information and communication technology. The increasing interdisciplinary character of this field contributed to the raise of community support to an important topic in applied informatics.

Summarizing different definitions one can characterize communities as groups of people who share values, interests and collaborate or help each other in the context of the common interests (Mynatt et al., 1997). Most characterizations also ask for a common physical or geographical place, the same city, a village or a building. This meeting place can also be a virtual one – an electronic communication channel (provided by a community support platform).

The success of community support platforms depends on the active participation of a significant percentage of the community members. Hence, the availability and modality of access to the community support infrastructure can be considered a major issue. However, experience so far demonstrates that the common user base of community support systems is mainly composed of computer literate individuals, accessing the platforms with desktop computers at home or at the workplace. In fact, from the technology point of view, community support systems often are large bulletin boards and the main user interface usually is a Web browser.

A special kind of communities are Communities of Practice (Lave & Wenger, 1991). A community of practice is focused on a domain of knowledge. The members collaborate to solve their problems or to combine resources to address larger problems than they could do individually. Members develop their shared practice by interacting around problems, solutions, and insights, and building a common store of knowledge.

Collaboration in communities of practice happens through collecting and indirectly sharing information and by directly communicating with each other. For the latter it is important to find potential collaborators and to make contact with them. While this is possible without physical contact, most collaborations are still

grounded in physical meetings like conferences or workshops, where people have the opportunity to make new discoveries and generate new commitments. Both during physical meetings and in virtual encounters, introducing oneself to potential communication partners and browsing potential communication partners is of great importance.

In this paper we present the results of an interdisciplinary exercise in designing tools for supporting community members during face-to-face meetings. The presentation of the findings is done in a process-oriented design view. In the following section we first address community support in general and identify different requirements for community support tools. Then we focus on the support needed for community members to quickly learn about each other at physical meetings, and briefly address the general issue of identity management. In the main part of the paper we then describe the process in which we designed support tools for this scenario. Thereby, we especially focus on the concept for the so called Community Pillar for exploring communities.

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 Newsgroups were created – both on the Internet (Arpanet) and on alternative networks (e.g. FidoNet).

The main activity in a community is the exchange or communication among the community members and finding people to communicate with (in order to initiate and coordinate the collaboration). While in small communities where all members know each other matchmaking support is not a major issue and communication can be handled with existing media, large communities (of practice) can benefit a lot from additional “communication and matchmaking support”.

Community support systems for large communities first have to provide a “medium” for the interaction among the members. This can be a clubroom with bulletin boards, a magazine, regular physical meetings or a solution based on networked computers. When networked computers are used to provide the information channel, the channel can be enhanced with features that make use of information about the community members to do (semi-)automatic filtering and personalization. Additionally, the exchanged information can be easily accessed from different location and be replicated easily.

The “medium” also can support finding communication partners. To identify other members for collaboration community support systems have to provide awareness of the existence and the activities of other members, and help to discover relationships among the community members (e.g. by visualizing them). This awareness and matchmaking support will be the main focus of this paper.

In addition to providing functionality it is important to address the modality of community support. When talking about electronic community support one usually imagines desktop applications. But it might be useful to think of other applications to support interaction between community members. Electronic community support has been, until now, determined by boundaries of stationary computers and desktop based user interfaces. Ubiquitous Computing, i.e. new user interfaces and the Disappearing Computer, and mobile computing are addressing these boundaries and offer possibilities for enlarging the reach of community support systems. Mobile interfaces open completely new fields for community support – new features and new scenarios can be contrived.

3. SUPPORTING COMMUNITIES AT PHYSICAL MEETINGS

An important activity in communities of practice are (physical) community meetings, i.e. events during which members of the community come together for communication and for exchanging information.

Support for awareness and matchmaking during such physical events currently is limited to simple badges and printed participant lists. One shortcoming of these tools is that they usually cannot be influenced a lot by the community members whose information is distributed through them.

We took these observations as a starting point to look closer into possibilities to support community meetings. To start the design process we first asked ourselves the question of “How do people get in contact with each other and what do they need for that?”. The main points of the answers were:

- People who want to get acquaintance with others have to present themselves to other people with information about their identity.
- This information should include different aspects of their identity, not only the affiliation but also more personal details, for example attitudes, hobbies and music preferences.
- The tools for acquiring, organizing and displaying the information have to be user-friendly and have to give the owner of an identity full control over presentation and propagation of the information.
- The tools should be integrated in the environment of the community meeting.

Looking into which information is of interest during a physical meeting we conducted surveys during community meetings and identified the following classes of information:

- name, affiliation, country/city of origin, country and city of residence
- information about and from (other) identities on the internet (e.g. pseudonyms)
- area of work, professional interests
- personal details, like personal interests
- belonging/participation in sub-events during the physical event (e.g. participation in a particular workshop or excursion)
- dynamic interests (“looking for someone to have dinner with today”)

After defining these kinds of criteria, we tried to think about more specific requirements of the tools we wanted to conceive. Solutions are needed for three tasks: 1) introducing individuals to the community, 2) presenting the community to all participants of an event, and 3) managing personal information or identity management.

Introducing individuals to the community

When the members of a community meet at a physical gathering, they usually do not know much about each other. To introduce the participants to each other usually simple badges that show the name and affiliation are used. These devices help to identify possible communication partners and to start conversations.

However, the possibilities classical name tags offer to introduce oneself to the community are very limited. A concept of a customizable badge will be presented as a tool to permit individuals to present themselves to others, and to add more personal information to the common institutional details.

Presenting the community to all participants

While presenting individuals to the community is something happening in face-to-face encounter, there also has to be a possibility for a member to get an overview of the community as a whole. It should be possible to access information about all participants to quickly identify possible contacts.

The participants lists that fulfill this task today are very inflexible and do not cover all possibilities of this function. Later in the paper we present the concept of a Community Pillar as a medium that is accessible for the whole group and that allows to get an overview of the group.

Managing personal information, identity management

In all functions that acquire information about community members and present this information to other members user control is a critical issue. First there is the need to be able to edit the information, and second there is the need to define the availability of the information.

Managing which information is available for which person or application is called *identity management*. Identity management is something we do in normal conversation everyday when we decide on what to tell one another about ourselves. In interactions with others we consider the situational context and the role we are currently acting in as well as the respective relationship with the interaction partners. In our view this flexibility needs to be addressed in networked based computers systems and especially in community support systems (Koch & Möslein, 2003).

In this context the literature often discusses the possibility of defining different access rights to the information in the user profile (Koch & Wörndl, 2001). While in general it makes sense to determine on a per user basis what people are allowed to see, for the setup of physical meetings it seems reasonable to give all people attending the meeting the same access rights. From user queries we have only derived the need to

differentiate which information should be visible in direct contact (e.g. badge) or when not in direct contact (e.g. participant list).

For acquiring and changing user profile information and for defining the access rights we foresee a Web-based application that is available to the community members before and during the community meeting.

4. MAKING UP OUR FIRST DEVICE: A CONNECTED BADGE

After defining the basic conditions we started working with scenarios trying to think about possible situations where a user should need to introduce herself. In the design practice, scenarios are a quite common way of approaching projects and it is an effective technique to push teamwork to generate new solutions (Carroll, 1995). In our discussion we deliberately concentrated on the design process, which often is neglected in technology driven work on user interfaces. As a result our work is not a technological design description but wizard-of-oz prototypes and mock-ups, scenarios that present our design ideas and that can inspire future user interface developments.

Starting point of the scenarios was the name tag or badge. This device solves some basic needs:

- It gives essential information about the user: generally name, surname, university of affiliation, country.
- It is easy to wear and to bring around.
- It can be stored after the event as a souvenir of the meeting.

Nevertheless, this traditional tool has some evident limits and defeats: even if it presents information to other people, it does not give the user means to say something about her personal identity. The presented information does not include any of the features involved in someone's likes and dislikes and personal attitudes. The traditional badge, besides, can hardly be modified or customized by the user herself: its structure is quite limited and usually corresponds to a predefined schema. That adapting and extending the information on badges is a real need shows in the fact that during meetings you often can see examples where participants try to correct or modify data on the badge. With a dynamic badge that allows updates without intermediaries it would be much easier to change and add personal information even during the event. In this way the tool could be a distinctive sign of the individual.

An ideal badge should give information about the person wearing it and be easily customizable by the owner herself. With these requirements in mind we tried to focus on different mock-ups using raw materials like colored paper, pencils, bend etc and we worked out some examples (see Fig. 1).



Fig 1. Building prototypes for badges

The first examples were paper-based only, and allowed to add personal information in different ways and to update the information when needed (by reprinting the badge or by adding paper stickers). Upon these first basic prototype we started to create scenarios with digital badges, light and easy to carry around, but we settled down for the less technologically driven paper-based solution in the end. The event organizers distribute paper based badges but allow the users to control the information on their badges through the identity management application. The participants can customize their profile information prior to the event.

During the event they can correct and enhance information by reprinting the badge. Additionally, stickers and post-its are provided to add dynamic requests to the badge.

5. THE COMMUNITY PILLAR: STAGING INTERACTION

As “personal device” that is used to exchange information between people who are close to each other, the badge is not a tool for getting an overview of a community and its members. Trying to think about a device which could support this we have been starting to imagine the Community Pillar. Basically, the Pillar is a large cylindrical digital display that is installed at a highly frequented space at the community meeting. The cylindrical shape makes the Pillar accessible through all sides and invites people to surround it. The Pillar, as part of the community support system, has access to information given by all the members of the community through the Web interface before and during the meeting. Through queries using the touch sensitive screen the information can be presented on the Pillar with visual animation.

5.1. Triggers for the idea

A community in the forming, as we have seen, needs means to support the exchange of information and to provide its members with a “general picture” of how the community is composed.

In interviews with participants of physical meetings a recurrent topic started to emerge when people described the strategies they used to try to compose such a “community picture” from the fragmented information they were receiving via email (or Web pages) and what they encountered once in the real setting (information on the badges, conversations, etc). How many designers are there? How many social science people have registered? Who else lives in Germany? Even though most of the information for answering such questions existed somewhere, there was no clear and simple way to present it for the whole community in interesting and useful ways. The main objective of the Pillar is to invite participants to “search” and construct general images of different aspects of the community.

Additionally, the Community Pillar should support the participants of the meeting in informing each other about interesting activities and to identify community members by the (spontaneous) activities they are participating in.

Currently, all these functionalities are provided by static and non-interactive participant lists and message boards. The idea of the Community Pillar evolved from combining message boards and large screens to a dynamic solution that can profit from the special configuration of the room and from the flow of the participants. The goal was to use the large screen not as an “Oversized Web browser”, but as a place for (collaboratively) discovering and meeting people.

5.2. Scenarios of interaction possibilities

The Pillar located in a public area, constantly displays icons (images) of all the participants. These icons can be specified by the participants prior to the event or during the event using the Web based identity management application. A participant standing in front of the Pillar can select a question to the database from a set of queries, like “Who comes from Spain?” The Pillar will “move” the icons that correspond to the query and make them gather around the point where the query was made. The result as seen by the person asking the question is a visual collection of icons that can give a “general” image of the kinds of people that matched the query. The person can go deeper into each participant’s information by touching the respective icons to find out about the person or add another query on top of it. If the objective was to know only an approximate number, the collection of icons gathered will be sufficient.

Since the icons move (through animation) around the Pillar when the query is done, passers by can discover their icons moving around and might feel tempted to inquire who and what has been asked for. Also other persons around the Pillar can have a “feeling” of what is going on. In this way the questions been asked to the database remain visible for the whole group and need not to give very specific details in the first instance. It is important to note that every person remains free to decide the level and amount of information that gets accessible through the Pillar, and can change those settings during the whole event by using the web interface.



Fig 2. Interaction with the Community Pillar

In addition to queries for (static) attributes of the participants the Pillar also allows to display dynamic announcements and to search for the association of members with these announcements. For example a spontaneous trip to the local pub or a tango session by an enthusiast participant can be announced. Members of the community, in search for activities, can check for a general idea of who is going and also decide to join. These specific announcements are visualized in the upper part of the Pillar to distinguish them from the other regular queries about the composition of the community.

By being a strong component in the physical environment the Pillar can become an interesting and playful gathering point, which gives useful information and support for the community to become a real working, functional one. The interaction possibilities of both the shape and the content of the database are in interplay with each other and can offer interesting possibilities, provided that people remain in control of the information and the functionality remains flexible to support new needs.

6. RELATED WORK

There is a large body of related work both on community support in general and on special devices like electronic badges or Community Pillar like displays.

6.1. (Electronic) Badges

We have found no work on enhancing standard (paper) badges to better support community building. In this context we only can refer to well-known examples of color-coding badges for indicating different roles of participants. However, there is lots of work on electronic badges.

First there are several projects using electronic badges as location indicators – to give other users in a workgroup information about the whereabouts of their peers and to provide location aware services like automatic phone re-rooting. See the Active Badge work at the Olivetti Oracle Cambridge Research Lab (Want et al., 1992) or the ParcTabs at Xerox Parc (Weiser, 1993).

Large-scale usage of badge-like devices for matchmaking can be traced back to the so-called Lovegetys in Japan (reportedly over 1,000,000 have been sold in 1998). The devices come in male and female versions, and you enter what level of relationship you're interested in (Chat, Fun, or Friend). If you have a male version and run across (via radio waves) a female version set to the same level, both devices flash and optionally beep to let you know that you have found someone compatible.

One example for devices for being used in physical community meetings is the so-called “Charmed Badges” from Charmed Technology (www.charmed.com). A Charmed Badge is a small device that stores contact information of the owner and that reads other Charmed Badges via infrared technology. The information collected can be downloaded to a desktop computer resulting in a list of relevant contact information. The proposed usage is to automatically collect business cards and keep a record of whom you talked to during a conference or fair.

The New York based company nTAG Interactive (www.ntag.com) offers another example for an electronic badge to support community meetings. The nTAG is very flexible and can run different software. So, in addition to providing and collecting personal information, the meeting schedule can be stored and different “matchmaking games” can be played with the badges. Since it cannot be assumed that every participant brings her own electronic badge, nTAG Interactive lends out sets of badges and software for different applications of the badges to meeting organizers.

6.2 Large Screens

Large screen user interfaces are not a new concept, having been pioneered in the 1970’s by Myron Krueger (Krueger 1991). Much recent work has aimed at the use of large screens for focused collaboration either between co-located or distributed users and using both 2D and 3D interfaces. In all cases the central concepts are to provide an interface, which can be used simultaneously by more than one person, and to provide a large working area that can fill the field of view without having to resort to “exotic” hardware such as head-mounted displays of the kind used for immersive virtual reality.

An example of usage of large screens to support collaboration is the DynaWall (Geissler, 1998). DynaWall, developed at GMD/Fraunhofer-IPSI, is a large screen display with an active area of 4.5x1.1 meters and a resolution of 3072x768 pixels. It is formed by three networked, back-projected electronic whiteboards each with its own controlling PC. User interaction is by hand-gesture and pen input.

Only recently a trend investigating the publishing possibilities on large screens has started to emerge, specifically addressing settings like conferences and exhibitions. The Silhouettell system (Okamoto et al., 1998), for example, proposes to use large screens to project information of interest to people currently visiting a certain area of the conference. The system is able to detect presence of people, associate an identity to them and retrieve a profile describing the interests. The displayed information is then based on the intersection of the different profiles.

A slightly different usage of large screens can be found in the Meme Tags project from MIT Media Lab. In this project large screens, named Community Mirrors, are used to publicly display the nature of interactions happening in shared spaces among people equipped with special wearable devices to exchange short messages (Borovoy et al., 1998).

Other usages of large screens for supporting communities are the Plasma Poster from Fuji Xerox Palo Alto Laboratory (Churchill et al., 2003), the Magic Wall from Accenture Research, and the CommunityWall (or Cwall) from Xerox Research Lab Europe (Agostini et al., 2000; Snowdon, 2002). The CommunityWall has been designed to support serendipitous information discovery and create an environment that fosters social encounters (conversation) using documents, news and peoples’ opinions on them as a trigger. While in the Campiello project, where the CommunityWall was invented, the focus was on open communities, meanwhile the focus of the development switched to office environments, i.e. communities sharing the same physical work location (as in Plasma Poster and Magic Wall).

7. CONCLUSIONS

In this paper we outlined some thinking and discussion around identity management in order to support matchmaking in physical community meetings. Coming from the general idea of supporting user representation and identity management we have discussed into more detail two “tools”, the badge to present oneself to people one is talking with, and the Community Pillar to explore the community in a public space and to find other people one would be willing to contact. We argued that there should be more information available on the badge and the pillar than current conferences are collecting and releasing about their attendees. In this context the control of the user over the information and how it is released and the dynamicity has shown to be an important issue. It has to be possible for the user to change and adapt this information before and during the event.

The goal of this paper was to bring together the interdisciplinary thoughts on community support in physical places in a structured way and to provide a good basis for further exploring the issue of identity management for communities. The discussed designs and the presented prototypes can serve as inspiration for future community support user interfaces.

While the cylindrical Community Pillar will not be available as an interface for some time, we have started to build a system for supporting physical places of exchange based on large screens. The system will be presented and evaluated at the conference Mensch und Computer in September 2004. It provides the easy to change (paper) badge system and an icon based exploration space for participants through an interactive large screen. The identity management functionality is integrated in the conference registration Web application.

Most of what we addressed in designing support for physical meetings can also be adapted to virtual community meetings (i.e. interaction on Web based community support platforms). Especially, the need for user representation (to present yourself to other members when interacting) and of identity management is similar and clearly needs more attention in the future. Additionally, we foresee that future community support solutions will include both, virtual platforms and support for physical meetings. This raises the need for easily integrating the systems or making them different user interfaces of one system. Such questions of interoperability and modularity of community support systems are addressed in our group in the project Cobricks (www.cobricks.de).

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