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Reconsidering Support for the Members of Specialized Online Communities

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Abstract
Since its emergence, the topic of online communities attracted large interest from Human-Computer Interaction and sociology researchers alike. The term "online community" has been generally associated with electronic "meeting-points" of various degrees of synchronicity and persistence, provided through a number of technologies. Based on empirical studies of two different types of online communities, this paper attempts to challenge the "meeting-point" centered approach by i) reconsidering individual needs of the members forming the community and by ii) emphasizing the importance of supporting content-complex activities.

Keywords
Community, Online, Virtual, Sociability, Individual, Awareness

1 INTRODUCTION

The question addressed in this paper is how can we design IT systems for online communities in order to better support specialized work on complex content. Our approach builds on prior work conducted in the area of computer supported cooperative work (Schmidt and Simone, 1996; Schmidt and Bannon, 1989) and draws on concepts of socialibility, communities of practice and, in particular, online community (Preece, 2001; Pargman, 2000; Smith and Kollock, 1999; Wenger, 1998).

Ever since the publication of *The Networked Nation* (Hiltz and Turoff, 1978), there has been a growing interest among researchers, educators and commercial developers in the design and use of Internet based "virtual communities". As pointed out by O'Day et al. (1996), such communities are hard to characterize; they do not emphasize support for specific group activities and often are not particularly intended for work: "even when these communities are sites for work-related activities, they are overwhelmingly social and open-ended in nature" (O'Day et al., 1996. pp 160).

The term "virtual community" was coined by Rheingold (1993) and defined as "cultural aggregations that emerge from the net when enough people bump into each other often enough in cyberspace". Also called online communities, virtual communities have been successful at supporting informal communication, gaming and programming inside Multi-User Dungeons (MUDs).

In most such online communities, there is an identification of the community with the system that supports it, the community is immersed in the system, which becomes a *sine qua non* for the existence of the community. The system serves as an essential "meeting point" for the community members. However, others aspects such as individual needs of the members forming the community and their content-complex activities have been overlooked in the study of online communities; even though e.g. O'Day et al. (1998) and Bruckman (1998) have expressed interest in such issues.

This paper contributes at understanding such aspects related to the individual in the community context. We present the analysis of two cases that relate to two different online communities. By contrasting the case study findings, we discuss the questions addressed in this paper.

2. CASE STUDIES

2.1 A professional educational online community supported by a mud object oriented (Moo) environment

The primary goal of this study (Cerratto 2001; Cerratto and Waern, 2000) was to determine whether the teachers could conduct learning activities in an electronic environment and how the focus of the conversations evolved over time. The study was conducted through the analysis of the use of online communities by experienced teachers attending a professional and educational training. In particular, the interest lied in how conversations aiming to elaborate mutual understanding might be affected by the characteristics of an online Moo-based community.

Moos are persistent artifacts where interactions with objects and people can be extended over time, mediated by historical trails of activity or talk. A basic characteristic is that all communication and actions leave behind a record at least until the text scrolls off the screen and each person can participate in a single activity at a time or in several possibly overlapping activities. The computer system studied consisted of three elements:

- A text-based virtual environment with a web interface designed to support large numbers of users in a single virtual place,
- A set of communication commands (speaking, whispering, paging, nonverbal actions) for the environment,
- A set of tools and objects (virtual whiteboards, sharable text documents, transcript recorders) and commands to create and manipulate them.

Two groups consisting of twenty-one and seventeen teachers respectively were observed from the end of March till mid-May 2000. The participants, teachers in Kindergarten to Grade 12 were attending a course that was part of a Master's degree program in Education offered at the School of Education at a midsize American University. They were familiar with the use of electronic mail and the World Wide Web. They had to accomplish two different tasks online. One task was to discuss their teaching experiences in relation to topics such as systemic change, collaboration and integration of technology, educational system design, scaffolding, and educational theories such as constructivism. The goal of this task was to reach a mutual understanding based on the discussion of these concepts. The other task was to learn how to use the technical environment, i.e. using commands for communicating, creating objects, navigating in the virtual environments, sharing documents, attaching icons to their user name etc. The examination of the course consisted of writing an educational

project in groups. All communication in the classroom was logged with the help of the Moo-based online community administration. A coding scheme was developed in order to characterize the content and the flow of the conversations (Cerratto Pargman & Waern, forthcoming). Questionnaires were sent to the participants after to have been completed the online course.

The analysis of participants' messages and opinions, mentioned in the post-questionnaires, showed that participants found it easier to get and exchange information rather than to elaborate it. The Moo in their activity facilitated the establishment and maintenance of social relationships while constrained focus in content-building and its understanding. This fact created thus a tension among some of the participants who expected to be able to reflect on their conversations and not just to be able to meet and chat online.

2.2 An online community of volunteer programmers in a student organization

The study consisted of a series of design interventions aiming at helping the software development activities pursued by the programmer group of a student organization over a period of three years (Bogdan, 2001; Bogdan, forthcoming). The group's task was to develop and maintain the software of the organization, which is mainly supporting the international exchange project arranged by the student organization. The project involves several thousand participants and organizers every year, from 50 locations all over Europe.

The programmer group was geographically distributed, communicating via e-mail and ICQ (http://www.icq.com). Face-to-face meetings took place periodically, approximately four times a year. All group members were volunteers. The group admitted new members on a regular basis. New members had various software development knowledge and experience. Besides getting new members, the group often lost members due to finishing studies or other circumstances.

The main question addressed in this case study was whether self-sustainability of such development activities could be achieved or not. Self-sustainability implies that members are able to learn and apply a software development technique by communicating via the Internet and other low-cost communication channels, as well as by taking advantage of the limited number of face-to-face meetings. Furthermore, incoming members must be able to understand the work done previously. Also, the work done by outgoing members must be easily transferable to members who stay. The group must have enough members at all times in order to be able to maintain the existing software and build new components. When the group encountered difficulties and it was clear that the activity was not self-sustainable, a new software development technique was adopted. Throughout this period patterns of *communication* and *learning* were observed in the group.

The group worked with three software development techniques. The first and the second techniques were dropped when they were found as inappropriate for the group situation. The first technique involved the usage of Lotus Notes™ to develop software, and it was dropped for both learning and communication problems: Notes has a very specific programming paradigm that is not generally taught in universities, and its visual programming approach was not suitable for the geographically-distributed, low-cost communication setting. The second technique was open source development of the software from the ground up in a similar fashion with famous open-source projects on

the Internet (e.g. Linux). This technique failed mainly due to members having difficulties in setting up and maintaining an open source development environment.

The third technique used is still working today, although it is still not clear whether it is self-sustainable or not. It involves a new toolbox that was designed for the members, based on the HTML and SQL programming languages, which were considered likely to be known or learned easily by the average undergraduate student of technology. The communication and learning patterns observed in the case of applying this third technique were as follows:

- New group members joined mostly during face-to-face meetings
- New group members learned the toolbox basics and were able to use it in three hours on the average
- Most of development took place outside the face-to-face meetings
- Programming problems were solved mostly using ICQ, and some using email (when no group member could be found on ICQ, due to not being online or due to not knowing their ICQ number)
- The preferred way to solve technology setup problems such as the ones encountered with the second technique was to establish contact via mobile phone SMS and continue the communication synchronously using ICQ. Email was rarely involved

The results show that the design efforts needed to make the specialized community "work" (i.e. to become self-sustainable) were mostly directed to individual learning aspects (e.g. combining HTML and SQL in an easy-to-learn language). No or little design efforts were spent in supporting communication between members. The communication as such took place using publicly available generic applications (e-mail, ICQ).

3 DISCUSSION

The first case concerned a professional educational online community supported by a mud object oriented (MOO) environment. Within this environment the study analyzed the interaction developed by two groups of professional teachers who attended an eight-week online course in education. It was found that the environment does support a social place where people can exchange information, support each other and play. However, teachers found it difficult to reflect on and elaborate understandings of educational issues by using the synchronous text-based communication environment. This case pointed to the need of considering seriously the balance between the system as "meeting point" and the system as a "working point".

The second case concerned a set of tools designed for an online community of volunteer programmers in a student organization. Reflecting on the design process, we found that the tools that were most urgently needed by the community members were strictly single-user -programming languages, programming environments- and none of the tools in the toolbox was designed to support sociability (cf. Preece, 2001); since email, and other general purpose communication tools were considered sufficient.

The common observation made from the case studies is that the more complex the community activity, the less important the community "meeting point" and the more essential the member "working point". Supporting only the establishing and the maintaining of relationships is not enough for the kind of work performed by members

of a sufficiently specialized community. Based on this observation, we emphasize the importance of support for individual aspects as part of the overall community support.

3.1 An example

In order to exemplify how can these findings be applied when designing for online communities, we present the design of a system that was subsequently devised for the group of voluntary programmers involved in the second case study.

The system is made of a number of independent WWW-based "workbenches" where each programmer can develop. Each workbench provides the individual developer with access to all the toolbox features in order to help her/him to work on one of the group projects. By bringing the workbenches together, a "meeting point" is achieved, although "working point" is still the main focus.

The system takes advantage of the "meeting point" aspects in several ways. First, it makes members aware of each other's online presence, thereby giving them cues about who else is available for work. Comparing to the general-purpose ICQ awareness system, this solution brings a supplementary cue: the respective member is online and available for development work, which is richer than just the generic online information supplied by ICQ. Second, the system provides a connection to the generic ICQ system, helping members find each other on ICQ, in case they are not logged on the system when their help is needed. Third, community members can see the "last touched" date of each other's workbenches, thereby becoming aware that somebody else "was around". Fourth, members who open workbenches for working on the same project become aware of each other's progress and are helped to get their changes "in sync".

As can be seen, when the individual workbenches were brought together, awareness, understood in the terms of Dourish and Belotti (1992) and Sandor, Bogdan and Bowers (1997), naturally became an area for providing features for supporting cooperation. Presence awareness features are pervasive in the classical "meeting point" systems currently addressed by related research (e.g. entering a room in a MUD). However, the existence of detailed support for the particular *individual task* (programming) has allowed us to provide support for *task-related awareness* (e.g. about files changed in one of the workbenches). Such task-based awareness is not supported by the "meeting point" system according to the analysis presented in the first case study. Furthermore, while the integration of awareness features in the system was seen as valuable, the actual communication was still left to generic channels (ICQ) and the generic awareness mechanism provided by ICQ was not replaced, but augmented.

4 CONCLUSION

The studies presented in this paper support the argument of further investigating the "working-point approach" to online communities and more specifically, reconsidering individual needs of the community members. As shown in the design example, supporting the individual needs first led to ways of providing support for cooperation that were more specific to the group activity. This also emphasizes the importance of supporting content-complex activities at both individual and community level.

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