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Online Communities and Online Community Building

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INTRODUCTION

In this article, we define and describe the concept of online communities, outline the essential conditions under which they emerge and present some means that foster the building of online communities.

"Online community" is one of the buzzwords in the age of Web 2.0. Within this article, we refer to online community as a voluntary group of users who partake actively in a certain computer-mediated service. The term "online community" is preferred over the term "virtual community," as it denotes the character of the community more accurately: community members are interacting online as opposed to face-to-face. Furthermore, the term "virtual community" seems too unspecific, because it includes other communities that only exist virtually, whereas, an online community in our definition is always a real community in the sense that community members know that they are a part of their community.

Nevertheless, there are other reasonable definitions of online community. An early and most influencing characterization (which unfortunately utilizes the term "virtual community") was coined by Howard Rheingold (1994). He wrote: "…virtual communities are cultural aggregations that emerge when enough people bump into each other often enough in cyberspace. A virtual community is a group of people […] who exchanges words and ideas through the mediation of computer bulletin boards and networks" (p. 57). A more elaborate and technical definition of online community is given by Jenny Preece (2000), which acts as a benchmark for developers since then. She states that an online community consists of four basic constituents (Preece, 2000, p. 3):

- Socially interacting people striving to satisfy their own needs;
- A shared purpose like an interest or need that provides a reason to cooperate;
- Policies in the form of tacit assumptions, rituals, or rules that guide the community members' behavior; and
- A technical system that works as a carrier that mediates social interaction.

Not explicitly mentioned in this characterization, but nevertheless crucial for our aforementioned definition (and not in opposition to Preece's position), is voluntary engagement (see also Janneck, Finck, & Oberquelle, 2005).

As Preece's (2000) definition indicates, the basic constituents of online communities include individual issues, group-related issues, as well as technology-related issues. Online communities thus comprise the participants' basic individual motivation, the social interaction processes entailed to "bundle" individual needs to increase efficiency, and the implemented technical functions that support these processes.

In the light of the aforementioned role of social processes, it is not surprising that, with respect to online communities, findings from voluntary groups of active user communities outside computer-based systems are also a highly relevant source of information (see e.g., Baumeister & Bushman, 2008). In the section devoted to online community building, we will present Kraut's (2003) suggestion of a highly-sophisticated application of social psychology theory to address some well-known problems in online communities.

BACKGROUND

Just because everybody is now talking about them, online communities are historically seen neither as a repercussion of the World Wide Web—which dates back to 1991 (Berners-Lee, Cailliau, Groff, & Pollermann, 1992)—nor as dependent on the Internet as a transport infrastructure. In fact, online communities emerged at the time when ARPAnet—the predecessor of the Internet—was still restricted to military-

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funded institutions. Some of these online communities were based on computerized bulletin boards first introduced by Christensen and Suess (1978). Their system was called CBBS (computerized bulletin board system) and followed the idea of a thumbtack bulletin board hosted electronically on a computer. Other computer hobbyists were able to connect with their home computers via a dial-up modem connection and could "pin" messages to a shared "board." The first online communities developed when other participants responded to those messages and created ongoing discussions. At that time, computer hobbyists and scientists were more or less the only ones who owned computers and modems. Therefore, most topics on CBBS were within the realm of computers, but in the long run, the topics of discussion broadened. By the 1980s, similar systems appeared that were now called BBS (bulletin board system). The most well known BBSs were "The Well" (Whole Earth 'Lectronic Link) and FidoNet (Rheingold, 2000).

Apparently, at the very same point in time, the technological and social environment was ready for online communities, as there were at least two other independent developments emerging:

1. The Usenet was invented by computer science students at Duke University and the University of North Carolina. They used a simple scheme by which these two computer communities could automatically exchange information via modems at regular intervals.
2. The first MUDs appeared at the University of Essex (UK) creating playful and imaginative online communities. MUDs (Multi-User Dungeon/Dimension/Domain) are computer-implemented versions of text-based role-playing games, in which multiple gamers can take virtual identities and interact with one another. Early MUDs were adventure games played in a labyrinth of dark dungeons with hidden rooms, trapdoors, and so forth.

Nowadays, most online communities are using the Internet as a carrier. Most of them are Web-based, using HTTP as a protocol for transportation and a combination of XHTML, CSS and JavaScript for presentation. But there are still communities that employ other systems and protocols, like newsreaders using NNTP and mail-groups using SMTP- or IRC- (Internet relay chat) based chatting systems. Some online communities even use multiple systems and protocols to communicate and cooperate.

A multiple group of new Web-based services like instant messaging, forums, chats, Web logs (or blogs), wikis, social bookmarking services and several types of other sharing services (e.g., for photos, videos, audio-files, or files in general) has recently been developed. Some of these services like instant messaging, forums or chats are typical applications within the field of computer-mediated communication and therefore foster online communities. Other types of services like, for example blogs, are at first sight not made to be platforms to house online communities. But as soon as these services are enriched with comment functions, RSS feeds and linkbacks (linkbacks are means to obtain notifications when other documents are linked to a certain document) they can be used as such. The latest developments are platforms like Facebook or MySpace, often summarized under the somewhat vague label Web2.0. They typically combine several of the aforementioned services to create rich communication media that could be used by online communities.

ONLINE COMMUNITIES

The conditions in pure online communities highly differ from a computer-mediated communication situation within companies and corporations. Whereas employees in a computer-supported cooperative work (CSCW) context usually meet online as well as face-to-face, members of online communities have, as a general rule, never met each other. Working in a highly standardized company context, employees have to focus on task fulfillment within a certain timeframe. Superiors evaluate their achievements, and they are accordingly paid by the company.

Online communities live from their volunteers. Usually none of the community members can be forced to do something, and there are no tangible incentives. Basic research in motivation psychology (Franken, 2001) even shows that incentives tend to be counterproductive.

Community members usually show a high degree of intrinsic motivation to participate actively in the development of an online community. It is still open to discussion where this motivation comes from. Simple rules like "It's all based on trying to maximize the potential personal benefit" seem to fail, if the concept of the term "personal benefit" is too simplistic. The attention-economy-debate (e.g., Aigrain, 1997; Ghosh, 1997; Goldhaber, 1997) shows that personal benefit is a complex entity if one relates it to online activities in the World Wide Web.

The likelihood of taking an active part in a community increases with the potential personal benefit that could be gained within that community. This is directly related to the quality of the contents offered. As Utz (2000) stated, the likelihood of submitting high quality contributions increases with the quality and the manifoldness of the existing entries. Appropriate solutions for quality assurance are rating systems.

A "killer feature" for such an application generates immediate benefit for users as soon as they start using the application, even without anybody else contributing. Unfortunately, this kind of feature can't always be found and implemented. As a (partial) replacement for such a feature, one can follow best practices. After analyzing numerous

popular online communities, Kollock (1999) came to the conclusion that there are basically two sources of motivation: self-interest (what seems to be the most common motivation) and altruism. Self-interest as a motivator is linked to expectations of reciprocity: people are willing to help or cooperate with others if they can expect a future quid pro quo. Altruistic behavior, in contrast, denotes people's motivation to increase another's welfare without expecting anything in return (Baumeister & Bushman, 2008).

A widely discussed issue in the context of community building is the so-called public goods dilemma: if people can access public goods without restriction, they tend to benefit from these goods and, therefore, from others' contributions without contributing reciprocally. If the majority of community members are tempted to behave that way, the public good will vanish (Kollock & Smith, 1996). The main problem is to keep the balance between the individual and common interest: An individually favorable and reasonable behavior turns out to be harmful for the others, and in the long run, disastrous for the community (Axelrod, 1984; Ostrom, 1990).

Owing to these circumstances, it is not surprising that a great deal of all online community building projects have failed, even though much effort has been put into these projects due to the high profit opportunities within the field as, for instance, Hagel and Armstrong (1997) predicted.

ONLINE COMMUNITY BUILDING

Recipe-based fabrication of online communities is, at least, a bold venture if not an illusionary enterprise. Social relationships and group momentum are particularly hard to predict. As Rheingold (2000) explicated, online communities grow organically and tend to follow their own rules. Therefore, controlling efforts always have to be readjusted to the current group context and dynamics. Nevertheless, some well-approved principles could be derived from the findings that were discussed in the last chapter.

Kim (2000) presents a membership lifecycle which describes five successive stages and levels of participation:

1. Visitors (people not involved in the community processes);
2. Novices (new community members who are still trying to find their way);
3. Regulars (community members who are consistently involved in the community life);
4. Leaders (community members who keep the community running and bear responsibility as well as acquired rights); and
5. Elders (long-time community members who share their knowledge and communicate the community culture).

We have already stressed the importance of findings of "off-line" groups for online communities. In this respect, Kraut (2003) suggested applying social psychology theory to some of the well-known problems existing in online groups. In particular, Kraut addresses the problem of under-contribution in groups. This issue refers to a common characteristic of online groups, namely their highly uneven distribution of contributions with a small number of members contributing most of the content, and the majority of members acting as so-called lurkers or read-only subscribers. Typically, however, lurkers do not doubt the significance and usefulness of the online group they partake in; they simply do not contribute actively.

To overcome the problem of under-contribution, Kraut (2003) borrows from current social psychology theories like, for example, Karau and William's (1993) theory of social loafing. In particular, he suggests design guidelines to increase participation rates in this group. Kraut's guidelines include the identifiability of members, task attractiveness, group attractiveness, the group's overall size, and the recognition of the uniqueness and high significance of one's own contribution (compared to other members' contributions) as key variables to collective effort in online communities.

With respect to these key variables, Kraut (2003) suggests various design implications or strategies for optimization. For instance, identifiability is known to be an indispensable prerequisite to the success of online communities: Only if anonymity is not allowed, any change or progress being made will be displayed and connected to individual group members (see also Janneck et al., 2005). Individual behavior will thus become accountable.

In addition, to increase the attractiveness of contributing, the underlying software should provide interactive elements. Elements like, for example, a chat function supports mutual communication, which is more attractive and requires less effort than asynchronous communication.

Taken together, identifiability and providing interactive elements address, and eventually reduce, a broad range of group problems like social loafing or production blocking, because they act as a motivating effect on perceiving one's own performance.

Kollock (1999) also focuses on personal identifiability, which he links to the memory functions of a community supporting technological system. More precisely, he argues that cooperation within an online community can only be successful if individuals:

1. Can recognize each other, that is, they are not operating anonymously within the community;
2. Have access to each others interaction history; and
3. Share the presumption of a high likelihood of a future encounter within the online community.

This leads to the conclusion that online communities have to offer possibilities of creating and managing relationships by supporting continuous interaction between their members. Therefore, it is advantageous if the system has a memory, in the sense that every community member and every item stored in the system holds a personal history.

People tend to act from self-interest if they are aware that their actions have effects on their reputations: high-quality contributions, impressive knowledge, and the perception of being willing to help others enhance the prestige of the community member. Although altruism as a motivational state for taking part in an online community is less common in comparison with self-interest, it is still frequent enough to be addressed if one thinks about community building. People with altruistic motivation try to meet the needs of the group or certain group members. This motivational state can be satisfied by establishing a public space where these needs can be stated, communicated, and discussed.

Considering the public goods dilemma, it is essential to introduce a role concept to clearly communicate the borderline between being in a group and being out of a group. To get full access to all group resources, one has to join the group. Several functionalities are only accessible for registered and authorized users. The commitment that is required to join the group leads to establishing a comprehensible boundary between members and nonmembers. This, in turn, facilitates the togetherness of the group and the identification of the members within the group. The membership itself constitutes a strong coupling feature.

Three further selective measures address the public goods dilemma: personal presence, personal responsibility, and personal history. Anonymity and lack of continuity among the members promotes egoistic behavior. Therefore, modifying actions should be tagged with users' login names, which, in turn, should be associated with records of personal data. Tagging entries and actions with user login names makes it easy to recognize people and enhances the development of personal relationships and online cooperation among the community members. Seeing all modifying actions supports the participator's personal responsibility. If the system has a memory of every action, this gives a personal history to every community member, as well as to the community's artifacts. Information about past interactions of the members again increases personal responsibility. Whereas, information about interaction with the artifacts allows members to get up-to-date, or introduce members to new areas of interest, as well as familiarize new members with the online community's etiquette and Who's Who.

"Content is king" is commonplace for virtually all Web-based efforts. This is notably true for online communities operating on a user-as-editors base. To implement a reasonable quality assurance system, it is crucial to apply technical, as well, as social devices. On a technical level, this can be done by employing a content rating system. Employing an "A team" of highly motivated volunteers can, on the other hand, help the online community to start up by delivering good content. For all content producers, it has to be as easy as possible to feed new content into the system. The best way of avoiding barriers is through continuous usability testing.

Introducing dedicated and active moderators seems to be the most important step to nourish motivation of the community members. Moderators can enhance group activities and increase the efficiency of the group. They are responsible for communicating the group codex (etiquette), acting as role models for new community members, and helping in preserving continuity. Rojo and Ragsdale (1997) show that an active moderator can, to some extent, compensate for the lack of active members in an online community.

In face-to-face communities only members can start a conversation. In online communities on the other hand, the technical systems can initiate communication as well. This opportunity should be brought into play by implementing awareness functions as software agents that collect relevant information for users and present it in e-mails, RSS feeds or personalized portal pages. These agents generally base their information gathering and presenting strategies on keywords or categories stored in configuration files (profiles). It is crucial to keep these profiles up-to-date. Experience shows however, that the members' interests continuously change over time. Profile setting dialogues are often accessed once and then forgotten. Thus, there is risk for personalized services to decrease in quality over time. Hence, it is important to monitor user behavior and let the agents ask from time to time if their interpretations of observations of, for example, changing interests, are correct. Furthermore, people may change their general attitude toward the community. This can be connected to an altered degree of involvement and must be considered during the design phase (i.e., modifiable feature sets).

The open-source movement has become very successful in recruiting new developers who start their own projects or join existing software development efforts. Today, most, if not all, open-source software development communities use online services for collaboration. In the remainder of this section, the application of the requirements for software that supports online community building is demonstrated by the following examples of open-source software development communities:

- **"Killer feature":** Open-source projects are often founded to solve an existing problem, that is, the killer feature is the product of the online community. When others join the project, the work becomes even more effective.
- **Recruitment:** Open-source communities produce software systems that are not only intended for use by original members but also for external clients. These

external users, that is, users not actively involved in the open-source online community, can be made active developers that modify the source and give it back to the project. To foster this process of developer recruitment, online communities should provide transparent rules for becoming actively involved. The projects that do not seem to be hermetic have better chances of growing their developer base.

- **Transparency:** The most important possibility of gaining transparency is through a public archive of the project's mailing lists. Because it is often not easy to scan large e-mail archives, open-source communities should provide text documenting guidelines and standards.
- **Policy:** The Debian community, for example, maintains an open-source Linux distribution and is a good example of a growing community that has given itself a substantial set of roles, rules, and guidelines. They achieve transparency of their standards by publication of documents on their Web server: Other projects, such as UserLinux, use a Wiki for that, which makes such standards more vivid and activates community members' attendance.
- **Trust:** Debian has a twofold quality assurance system. There are no anonymous additions to the system, and approved maintainers electronically sign all modifications. Software bugs are reported by all users. The bug lists are available to the public.
- **Cooperation and usability:** CVS and Subversion are systems for configuration management for source code trees for distributed development teams. They are both good examples of cooperation software with a high usability that are efficient to use for everyday tasks in software development.
- **Awareness:** Workflows can provide awareness. Examples include automated e-mail distribution of users' software bug reports and e-mail notifications or RSS feeds of CVS or Subversion commits.

This exploration into open-source projects and their online coordination and cooperation tools reveals that a voluntary community approach works, and the infrastructures and supporting tools of these projects can be taken as a best practice reference case.

FUTURE TRENDS

Recently, the term "Socialware" was proposed for software systems dedicated to enhance social relations. According to Hattori, Ohguro, Yokoo, Matsubara, and Yoshida (1999), Socialware denotes systems which aim to support "various social activities on network communities." Supports include linking people with others, smooth communication in a community and information integration for a community. The Socialware approach was initially intended for CSCW systems that are used by stable communities. This approach seems suitable for implementing software for online communities as well.

It uses rules of interpersonal communication and transfers these structures into software. The technical concept associated with Socialware is a multiagent system architecture. The CSCW functionality is achieved through coordination and cooperation of a distributed set of software entities (agents). Users of a community system have personal agents for gathering and exchanging information, visualizing context information, and supporting decisions. Personal agents and the users they belong to are seen as personal units. Personal units interact with community agents that have the function of providing shared information and mediating communication between other personal units. This approach also makes it possible to link different partially-overlapping online communities.

A current development in online communities is the transformation of the virtuality of computer networks into the real world. There are different enabling technologies for mobile and ad hoc communities. An important factor is the ability to locate in cellular phone networks or with global positioning systems (GPSs). Using the positioning information as part of the application environment allows for mobile communities. They are often based on asynchronous communication, like Internet online communities. An example for such a mobile community is the petrol station price comparison community. In 2000, the German Research Center for Information Technology offered car drivers a location awareness service which gave a comparison price list of the varying petrol rates of all the petrol stations.

The availability of new short-range radio networking technologies, such as Bluetooth, WiFi or WiMAX, enables new synchronous mobile communities. This gives users the ability to connect devices ad hoc (i.e., without a server infrastructure), permitting mobility and interaction. As with other Internet online communities, game playing is an important technology driver, for example, pervasive group games are being developed (Pennanen & Keinänen, 2004) that could build up social structures in some ways comparable to online communities.

Finally, most characteristics that are prototypical to online communities can be found in so-called guilds in Massively Multiplayer Online Role-Playing Games (MMORPG). The gamers follow strict rules according to behavior and tasks for ensuring personal and common progress. Oral and written communication within and outside the game is essential for coordination and team play. Collaboration always has a short-term as well as a long-term perspective. Associated goals vary from coping with short but stressful in-game situations (e.g., fighting the "final enemy") to preparing and organizing activities months in advance (e.g., acquir-

ing needed resources). In spite of the "role-playing" label, serious and reliable relationships can be established within the MMORPG community (Yee, 2006).

CONCLUSION

Advanced software solutions like the aforementioned Socialware approach can help to build and maintain stable online communities. In the long run, though, it is not the technology; it is the people that make an online community work. Using the most advanced technology is neither sufficient nor, as early BBS/MUD approaches show, necessary to assure the building of a stable online community. People will always make creative use of technology by using it in other ways than were originally intended by the designers. This will, once in a while, generate possibilities for new online communities.

Nevertheless, the most important factor for successful building and maintaining an active online community is providing awareness about changes in the communities' databases to members. Awareness functions provide an understanding of the others members' activities and the communities' goals and progress; the user can thus relate and evaluate their own activities accordingly.

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KEY TERMS

Community Building: All activities related to building and maintaining online communities.

CSCW (Computer-Supported Cooperative Work): Software tools and technology as well as organizational structures that support groups of people (typically from different sites) working together on a joint project.

MMORPG (Massively Multiplayer Online Role-playing Games): Role-playing games played online by a large number of players at the same time. Participants are represented by customized avatars and solve different tasks (quests) on their own or in coordinated groups.

Online Community: An online community is a voluntary group of active users that partake actively in a certain computer-mediated service.

Socialware: Socialware aims to support various social activities on a network. Rules of interpersonal communication are used and transferred into community software.

UaE (User-as-Editors) Approach: The community members are responsible for supplying new content and assuring the quality of existing content, as well as for creating and maintaining the etiquette of the community.

Virtual Community: This is a featureless and, therefore, often misleading term usually regarded as synonymous to online community. The term "online community" is preferable, as it denotes the character of the community more accurately.

Wiki: Internet service based on HTTP and HTML providing "open editing" of Web pages with a Web browser. Hyperlinks between documents are supported with simple textual references. By default, everybody is allowed to edit all available pages.