Fall 2006
Volume I / Issue 1

Journal of New Communications Research

The Self-Organization of Virtual Communities

Dr. Christian Fuchs

Introduction

This paper discusses the notion of virtual communities (VCs) from a theoretical perspective. In it I develop my own notion of a virtual community. Most approaches give one definition of VC and argue why they have chosen it; more systematic and comparative discussions from a theoretical perspective are largely missing. This paper tries to contribute to the correction of this shortcoming. It gives specific focus to the discussion of what has been termed "Web 2.0" or "Social Software." The specific research questions that are addressed are:

- How can approaches to virtual community be classified?
- What is a virtual community?
- How can a virtual community be considered a dynamic system?
- What are the differences between Web 1.0 and Web 2.0?

The central notion employed in this paper for describing virtual communities is the one of self-organization that grasps the dynamic, complex, evolving nature of systems in nature and society. The main motivation for taking up this concept is that the modern world is inherently complex and dynamic and that its phenomena can best be explained by concepts that stress permanent changes and networked forms of organization. In the last decades self-organization theory has emerged as a trans-disciplinary theory that allows describing reality as permanently moving and producing novelty ("emergence") (Fuchs 2003c). Self-organization is a process where a system reproduces itself with the help of its own logic and components; the system produces itself based on an internal logic. Self-organizing systems, their own reason and cause, produce themselves (causa sui). In a self-organizing system new order emerges from the old system that can't be reduced to single elements; it is due to the interactions of the system's elements. Hence a system is more than the sum of its parts. The process of the appearance of order in a self-organizing system is termed emergence. The logic underlying self-or-

ganizing systems resembles the dialectical principles of the transition from quantity to quality, negation and negation of the negation (Fuchs 2003c.).

My notion of social self-organization is connected to the theories of Anthony Giddens and Pierre Bourdieu (Fuchs 2003a, b), who both argue that social structures and practices are dynamically related and form an evolving dialectical unity. Social systems are dynamic, and this dynamic character can be achieved by the mutual production of human actors/groups and social structures (cf. fig. 1). This process can be termed social self-organization or re-creation of a social system (Fuchs 2003a). The synergies released by communication processes between human actors result in the production and reproduction of social structures that enable further practices and communications by which social structures can again be produced and reproduced, etc. This process is self-referential, recursive and cyclic. Social systems permanently change themselves, and their dynamic is given by an endless emergence of social structures from practices and communications of human actors.

Social structures and human actions/communications produce each other mutually. Anthony Giddens has termed this cyclical process the duality of structure and has considered structures as medium and outcome of human practices; they enable and constrain actions. "According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize" (Giddens 1984, 25); for a discussion of how Giddens' theory fits into the framework of a theory of social self-organization, cf. Fuchs 2003b).

The method chosen for comparatively discussing notions of virtual community is based on dialectical thinking. Hofkirchner (2002) has outlined an epistemological framework theory that argues that one-sided theories of nature and society concentrate either on subjective (parts) or objective (whole) aspects of a system or separate these two aspects. These shortcom-

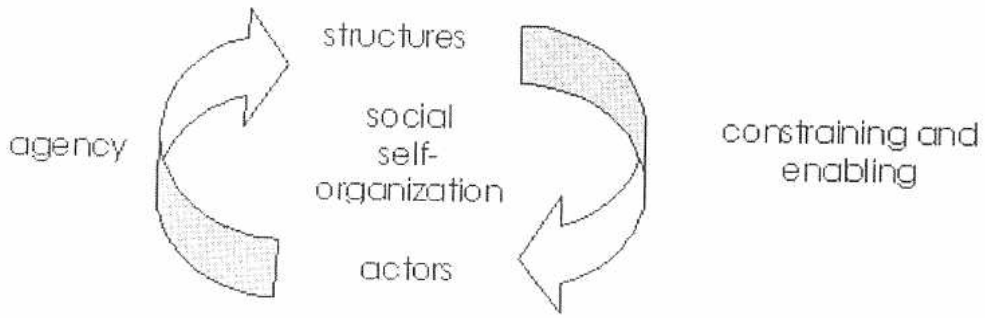

Fig. 1: Social Self-Organization

ings of what Hofkirchner terms "reductionism," "projectionism" and "dualism" can be overcome by a dialectical epistemology that describes systems as being wholes that evolve and dynamically gain new qualities that emerge from the interactions of their parts. Such a dynamic systems approach would be based on a dialectic of whole and parts, object and subject.

This paper is structured in the following way: First I give an overview of the role of community in late-modern society (section 2), then I discuss various notions of virtual community, try to establish a classification scheme, and develop my own approach (section 3). I discuss the notions of social software and Web 2.0 (section 4), give an example of a self-organizing virtual community (Wikipedia, section 5), and make some conclusions (section 6).

2. Communities and Change in Late-Modern Society

Max Weber (1968), based on his basic categories — behavior, action, meaning, interpretation, rationality, social action and social relationship — distinguishes four types of social action:

1. Traditional action conditioned by accustomed habituation
2. Affectual action conditioned by affection and states of emotion
3. Value-rational action motivated by the conscious belief in values
4. End-rational action based on means for rationally calculated ends

Weber distinguishes between society as social relationships based on value- or end-rational social action and community as social relationships based on traditional or affectual social action. "A social relationship, on the other hand, will be called 'communal' if the orientation of social action— whether in the individual case, on the average, or in the pure type— is based on subjective sentiment of the parties, whether affectual or traditional, that they belong together. Communal relationships may rest on various types of affectual, emotional, or traditional bases. Examples are a religious brotherhood, an erotic relationship, a relation of personal loyalty, a national community, a military corps" (Weber 1968, 54).

For Ferdinand von Tönnies, community (Gemeinschaft) is the organization of life in traditional, agricultural formations and society the organization of life in modern, capitalist formations. He argues that "the very existence of Gemeinschaft rests in the consciousness of belonging together and the affirmation of the condition of mutual dependence" (Tönnies 1988, 69), whereas Gesellschaft is for him a concept in which "reference is only to the objective fact of a unity based on common traits and activities and other external

phenomena" (Tönnies 1988, 67). The next table shows the main differences between Gemeinschaft and Gesellschaft in Tönnies's conception.

For both Tönnies and Weber, community has to do with a feeling of togetherness and traditions. Whereas Tönnies makes a sharp distinction between community as pre-modern and society as modern, Weber doesn't see such a strict dichotomy. Both wanted to strengthen community, Tönnies by socialist corporatives, Weber by charismatic leadership.

Communities are not automatically harmonious. The concept has in the past been used as a term for repressive systems, such as the Nazis' Volksge-

Community	Society
Harmonious consensus of wills	Rational will
Folkways, religion	Convention, agreement, public opinion
Mores	Law
Organic	Authoritative
Family	State, law
Village	Town, city
Kinship, inherited status	Class
Agriculture	Industry, commerce
Morality	Coercion, teaching
Essential will	Arbitrary will
Togetherness	Instrumentality

Table 1: Community and society in the theory of Ferdinand von Tönnies

meinschaft that is united by the belief in leadership and the superiority of "Aryans" to other groups considered enemies that should be eradicated. Absolute authority and race defined community for the Nazis; they had a holistic understanding of the concept that was blind for individual rights and power from below. Such oppressive usages of the term show that it doesn't make sense and is even dangerous to idealize communities.

In late-modern society collective identities and institutions such as parties, families, unions, churches, associations, neighborhoods, village or town communities, etc. that in the past functioned as means of socialization, identification and struggle are continuously eroding. This tendency has been characterized as "individualization" (Beck 1983) or "flexibilization" (Sennett 1998). Manuel Castells argues that the individualization of the relationship

between capital and labor, between workers and the work process, in the network enterprise and the crisis of patriarchy and the subsequent disintegration of the traditional nuclear family has resulted in networked individualism, "me-centered" social networks (Castells 2001, 128sq). The Internet wouldn't cause, but support the diffusion of networked individualism. Jan van Dijk (2006) sees network individualism as the phenomenon that individuals spend "more time alone accompanied by technology (transport and communication means) and that they will spend more time being online.

"However, being online might be fully social" (Van Dijk 2006, 168). In modern society, humans are considered as individual citizens, labor forces and property owners. Hence individualization is an inherent characteristic of modernism. During the first modes of development of capitalism, economic production required huge amounts of labor forces that had a limited variety of activities and were located in central places. The resulting ways of life in production, politics and culture were homologous for both the labor class and the corporate class. The individuals, due to comparable and relatively homogenous conditions of life, had homologous interests that were expressed in collective modes of organization and lifestyle. Fordist mass production and mass consumption were based on the standardization of production and culture. The emerging organizations were predominantly centrally and hierarchically organized and were coined by rigid command and control structures. The collective identities that many people shared were rather centrally defined and didn't allow a great deal of participation. This situation has changed. Identity has shifted from collective communities to individualization and the flexible association in various networks that may or may not be perceived as communities. This has multiple causes:

- ***Global network capitalism:*** As a result of the crisis of Fordism during the mid-1970s, a flexible Postfordist regime of accumulation emerged that decomposes centralized structures. It is based on a tendency for globally dispersed, decentralized structures of production that require fast changing flows of capital, power, money, commodities, people and information that are processed at high-speed on the local, national and global level in order to produce profit. The emergence of the logic of global networks for restructuring capitalism displaces the individual because local and national organizations enter crisis. They can no longer solve problems and hence give meaning to individuals in a situation where decisions are increasingly complex and taken at the supranational level that can't be controlled and understood by individuals who are fixed in local places.

- ***Knowledge society:*** Capitalist development demands a rise in productivity and hence the increase of the technical and organic composition of capital. In order to accumulate and to increase profits, technological progress is necessary. Constant capital (technologies) continuously substitutes variable capital (human labor power) in processes of rationalization and automation. Capitalist development hence results in the permanent dynamic overthrow and re-composition of labor, and there is a continuous decrease of exhaustive manual and industrial labor and an increase of intellectual, mental, communicative, social, and service labor. Knowledge-based capitalism and the decrease of industrial labor are the results of capitalist development and the evolution of capitalist technology. Knowledge work demands more agility, continuous change, and permanent learning. It is less homogenous than industrial labor, which has resulted in less homogenous ways of work and life that allow less points and situations of common identification.

- ***Neoliberal regulation:*** The deregulation of labor times, contracts, and legislation, the decrease of the total wage sum by the rise of precarious working conditions (flexploitation) and low-wage jobs, the dismantling of Social Security and cuts of state expenditures for education, health, and science are characteristic for the dominant Post-Fordist model of politics. Society is not considered responsible for the welfare of the individuals, but the individual is considered solely responsible for his own welfare, fate and future. This atomization separates individuals who have to see their colleagues, friends, neighbors, classmates, fellow citizens, etc. now mainly as competitors in existential struggles for survival. Networks of social security that allowed some form of shared central identity disappear, and a system of competitive individuals who have to struggle under conditions that only allow high-rise or absolute fall emerges. Competition under neo-liberal conditions undercuts the possibility for homogenous identities.

- ***Difference as commodified desire and ideology:*** Post-Fordist commodities are no longer standardized, but specialized and flexible. Commodities are now not mass products because they all look, sound, taste, smell, and feel the same, but because there is such a huge mass of products that look, sound, taste, smell, and feel different. Consumption ideologies advanced by public relations and the mass media don't approach humans as mass or crowd, but as individuals that are special and have specific needs and desires that commodity consumption promises to fulfill. Micro marketing and flexible specialization create, recreate, and commodity the desires of humans to be

different, not to share common identities with others, and to develop individual identities. Difference sells and is the new ideology of capitalism.

The centrally and hierarchically defined identities characteristic for Fordist and pre-Fordist capitalism have not been superseded by new shared identities that are open, dynamically reconstructed, defined from the bottom, and able to allow a great deal of plurality and individual expression, but by atomized individual identities that demand the competitive struggle for survival. The common aspect of individuals today is that they all have to see each other as competitors for survival, jobs, friends, payment, commodities, power and differing lifestyles. The conditions for the understanding of the category of community have changed. Communities can no longer be conceived as homogenous values and ways of life of groups that allow identification, solidarity and togetherness. Culture as the realm of production and reproduction of ideas, values, bodies, and meaning is no longer the realm of solitary communities, but is fully affected by the logic of competition.

The decomposition of centralized collective identities is both an opportunity for the liberation of lifestyles and a risk of increasing poverty, unemployment, isolation, and precariousness. Under the current conditions it allows great opportunities for few and high risks for most.

Anthony Giddens (1991) argues that individuals have a plurality of choices for action in high modernity because society is post-traditional. There are multiple milieux of action, numerous expert systems which individuals trust and distrust, globalizing effects of mass media, and a transformation of intimacy. Giddens is certainly right in arguing that overall there are more alternatives of action today than in former times, because society becomes more global and new activities, technologies, innovations, and knowledge are required permanently by the flexible regime of accumulation. But opportunities and risks are unequally distributed, because the material and intellectual resources that underlie action are unequally distributed. Hence there is a small class of people that are well equipped with resources and have great opportunities, and a class of individuals that is increasing in size and is deprived of resources and opportunities and hence is facing sharp existential risks. There is a gap between risks and opportunities. The "risk society" is a class-structured society, and institutional security that minimizes risks is vanishing.

The reason why people are interested in virtual communities might be that they feel society and the social systems they live and work in don't provide them with opportunities that guarantee participation and self-fulfilling

activities. Many individuals feel alienated and search for new communities that function according to principles that transcend the dominant logic of competition and capitalism that today causes feelings of alienation. Andrew Calcutt (1999) argues in this context that there is a dialectic of virtual community and alienation. I don't agree with Calcutt that the only tie of cyber-communitarians is their alienation from the rest of the world and that the primary experience they wish to share is that of the suffering victim (Calcutt 1999, 25-27). I rather think alienation is a more general condition and feeling that many people have in late-modern society that causes a search for alternatives that is not purely passive, but involves the active construction of new social relationships with the help of new media.

The rise of what is termed virtual communities has been enabled by technological innovations and by the rise of the Post-Fordist mode of capitalist development. But what is a virtual community? This question will be discussed in the next section.

3. The Notion of Virtual Community

There are different ways of defining and understanding communities. Table 2 gives an overview. The typology presented is based on the sociological distinction between action and structures that has resulted in different sociological traditions (action theory, interpretative sociology, symbolic interactionism, structuralism, functionalism) that are either more focused on human action or social structures. Some sociologists think that the main question of sociology is how action and structures are related.

3.1. Subjective Virtual Community

In (inter)subjective concepts virtual community is conceived as continuous communicative online practices that produce meanings and don't require homogenous interests and a consensus on values and interpretations. I will now document some (inter)subjective definitions of VC.

For Nancy K. Baym communities are practices, hence all social groups for her are communities. The important characteristic for her is "that a community's structures are instantiated and recreated in habitual and recurrent ways of acting or practices" (Baym 2000, 22). There would be shared engagement and understanding. Baym (1998) argues that VCs are influenced by factors such as social context, temporal structure, technological infrastructure, group purposes, and participant characteristics. A VC wouldn't have a stable social meaning; "ongoing challenges are an intrinsic part of social life in most on-line communities" (Baym 1998, 62).

"Virtual communities are groups or people connected primarily (if not solely) through online forums, including e-mail list servs, bulletin-board services (BBs), USENET newsgroups, MUDs and MOOs (Multi-User Dungeons and MUDs Object-Oriented), and other forms of online chat" (Kendall 2003b, 467).

For Manuel Castells virtual communities are "self-defined electronic networks of interactive communication organized around a shared interest or purpose, although sometimes communication becomes the goal in itself" (Castells 2000: 386).

For Mark Poster VCs are "electronic cafés, cyber salons, 'places,' in short, where conversation takes place either in 'real' time or by message facilities" (Poster 2001, 131).

For Steven G. Jones a virtual community is pulled together by the "ritual sharing of information" (Jones 1995b. 19). It is a social network created by interaction, "an arena of discursive interaction" (Jones 1997a, 15). VCs are "groupings of people headed in the same direction, for a time" (Jones 1997a, 17). He argues that people who portray VC as impersonal and substituting real-world interaction often have an "idyllic (and often romantic) view of face-to-face interaction. ... Face-to-face interaction does not necessarily break down boundaries, and to adopt it as an ideal will likewise not necessarily facilitate communication, community building, or understanding among people" (Jones 1995b, 28f). VC is not idyllic, but "an arena in which passions are formed, tyranny is exercised, love and death are braved, legacies are born, factions are splintered, and alliances dissolved" (Fernback 1999, 217).

David Bell (2001) suggests in this context that in order to avoid the confusion about the term community, one should speak of the "virtual Bund" (band), by which he means an online "elective grouping, bonded by affective and emotional solidarity, sharing a strong sense of belonging" (Bell 2001, 107). Although Bell is aware that the German term Bund is closely associated with charismatic leadership, he argues that charisma can also be collective and that hence the term is useful. The term Bund has a much more problematic meaning in German than the term Gemeinschaft (community). It is closely related to the idea of totalitarian leadership. During the Third Reich many organizations were termed Bund, so for example, the Bund Deutscher Mädel, the Bund Nationalsozialistischer Deutscher Juristen/Nationalsozialistischer Rechtswahrerbund, the Kampfbund für Deutsche Kultur, the Nationalsozialistischer Deutscher Studentenbund or the Reichsbund für Leibesübungen. A special German term ("Bündelei") has even been created for stressing the centralized and hierarchical meanings connected to the word Bund. Hence

I suggest that it is better to avoid to speak of a virtual Bund and to focus on the notion of communities.

3.2. Objective Virtual Community

There are two different objective understandings of virtual community. In the first the central feature of virtual community are absolute, highest qualities, such as shared values, shared identity and understanding, solidarity, unity, and togetherness. In contrast to subjective approaches in such concepts, not all online interaction systems are communities, rather only those in which intimacy, common values, unity, and togetherness are present. The stress here is not on communicative practices as in subjective approaches, but on values, i.e. on moral structures. Here are some examples for definitions of this understanding of VC.

Howard Rheingold stresses the importance of feelings in VCs: "Virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationship in cyberspace." For Rheingold VC is not the same as computer-mediated communication, but continuous CMC that results in feelings of affiliation. Community would be established by the stability of nicknames, quick wit, and the use of words to construct an imagined shared context (Rheingold 2000, 181sq).

For Jan Fernback (1999) a community is not just a place for sharing something individuals have in common, but it also has a symbolic dimension. It would be an entity of meaning and would have both a physical and a symbolical aspect. He refers to Benedict Anderson's idea that communities are imagined and argues that VC "exists because its participants define it and give it meaning. This doesn't mean that the community exists solely in the minds of the participants, but in the connection between what social constructs the user imagines (such as community) and the CMC-generated representations of these constructs.

Thus, if we log on, form relationships in cyberspace, and believe we have found community, it is real for us" (Fernback 1999, 213). VCs would be both entities and process, "boundaries and meanings are renegotiated" (Fernback 1999, 217). VCs would require emotional commitment: "Not all virtual social gatherings are communities. Without the personal investment, intimacy, and commitment that characterizes our ideal sense of community, some on-line discussion groups and chat rooms are nothing more than a means of communication among people with common interests" (Fernback 1999, 216). For Fernback VCs are collectivities. "This collectivity is driven by the principles

of democracy and egalitarianism in its use of CMC, not necessarily in terms of the content of postings in cyberspace. The CMC collectivity is thus concerned with censorship and other types of restrictive regulations in cyberspace, and it is these concerns, these formal issues, which bind the collectivity" (Fernback 1997, 46).

Etzioni and Etzioni define a community as "a web of affect-laden relationship that encompasses a group of individuals" (bonding) that have a "commitment to a set of shared values, mores, meanings, and a shared historical identity—in short, a culture" (Etzioni/Etzioni 1999, 241). Not all online communication will form virtual communities: "People who pass each other as strangers in bus terminals or railroad stations, or are all subject to an electronic broadcast, or 'meet' for the first time in a chat room, are best referred to as aggregates or groups but not as communities, because they do not share social bonds and a culture."

For Allucquère Rosanne Stone virtual communities are "social spaces in which people still meet face-to-face, but under new definitions of both 'meet' and 'face.' These new spaces instantiate the collapse of the boundaries between the social and technological, biology and machine, natural and artificial that are part of the postmodern imaginery" (Stone 1991, 85). VCs are "passage points for collections of common beliefs and practices that united people who were physically separated. Virtual communities sustain themselves by constantly circulating those practices" (Stone 1991, 85).

Maria Bakardijeva defines VCs as forms of virtual togetherness, "forms of being and acting together...growing from the technology of the Internet" (Bakardijeva 2003, 294).

"Community, like computers, has become networked. Although community was once synonymous with densely knit, bounded neighborhood groups, it is now seen as a less bounded social network of relationships that provide sociability support, information, and a sense of belonging. These communities are partial (people cycle through interactions with multiple sets of others) and ramify through space (a low proportion of community members in the developed world are neighbors)" (Wellman 2001, 2031).

Jonathan Lazar and Jennifer Preece (1998) argue that important aspects of online communities are shared goals, intense interactions, strong emotional ties, shared activities, access to shared resources, support between members, social conventions, language, or protocols.

A second objective approach defines virtual communities as artifacts or as oriented on material objects. Tools for organizing the exchange of information or goods are stressed. These can either be technological or economic

artifacts/structures. In the first case a virtual community is defined as a networked digital technology that enables communication and social interaction, and meanings are rather ignored. In the following example the stress is on networked resources: "A general definition of an online community is a group of people who share a similar interest, share networked resources, and communicate using a computer-mediated communication tool" (Lazar, Hanst, Buchwalter, & Preece 2001).

In a second case a virtual community is defined as an online place for trade and commerce, *i.e.*, for the exchange of economic goods/commodities. Not all continuous online communications are understood as communities, rather only those that are oriented on commodities, commerce, and trade. Hence, for example, an online self-help group or an online dating platform is not considered as a virtual community, whereas online auctions such as eBay or online marketplaces (such as the Amazon.com marketplace) are defined as virtual communities. Such approaches are imprinted by instrumental reason.

An example for such an approach is the one of John Hagel III and Arthur G. Armstrong who characterize a VC by "distinctive focus as to membership, integration of content and communication, emphasis on member-generated content, choice among competing vendors, commercially motivated community organizers" (Hagel & Armstrong 1997, 26). Sridar Balasubramanian and Vijay Mahajan (2001) see a virtual community as an aggregation of people that are rational utility-maximizers, interacting without physical co-location, engaged in mutual consumption (and eventually production), and having a shared objective, identity, or interest.

3. A Dialectical Approach on Virtual Communities

Representatives of subjective concepts argue that people like Howard Rheingold, who see virtual communities as online places where shared identities and feelings of togetherness and belonging develop, idealize online communication and hold on to an ideal of community that was characteristic for past epochs and was captured by traditionalists like Ferdinand von Tönnies almost a century ago. Representatives of objective concepts say that the intersubjective understanding of virtual community is too broad, sees all repeated online communication as community, doesn't allow qualitative differentiation, and has lost the ability of normative judgment.

But the different concepts of virtual community need not be seen as mutually exclusive. Subjective concepts stress the importance of online communication, while objective concepts see the importance of moral structures and material artifacts that allow exchange and the potential for the emergence of

togetherness, belonging, and shared understanding. An integrative approach captures all these moments as important for virtual communities by considering the latter as dynamic socio-technological systems of communication and meaning-production. The term "virtual community" seems to indicate that such systems have both a technological and a social subsystem. A dialectical approach connects these two aspects and describes the dynamic and processual character of the interconnected socio-technological systems of online communication.

Raymond Williams (1983, 75f) has pointed out that the term community has been in use in the English language since the 14th century and stems from the French communeté, the Latin communitatem (community of relations or feelings), and the Latin communis (common). In communities participants have something in common. The extent and type of commonality can vary in virtual communities. Depending on the type and degree of commonality, I will now identify three levels of virtual communities (see figure 2).

Level 1 of Virtual Communities: A Common Technological Infrastructure of Computer-Mediated Communication

In all virtual communities users share a common technological infrastructure. All repeated online communication forms a virtual community in the sense of sharing common standards of hardware and software that are needed for establishing interaction. Networked digital technologies and corresponding applications form the material foundation of virtual communities. Information technology is a first factor that influences different types of virtual communities.

Peter Kollock and Marc Smith (1999) distinguish six forms of online communication tools: e-mail/discussion lists (asynchronous, centralized control, push media), usenet/BBBs (asynchronous, pull media), text chat (synchronous, centralized control), MUDs (synchronous text-based visual realities), WWW web sites (multimedia interfaces for hosting synchronous and asynchronous online information and communication), and graphical worlds (synchronous online conversations enhanced by multimedia). But meanwhile the range of tools has become more complex, so for example, blogs and wikis must be added. Saveri, Rheingold and Vian (2005) identify eight clusters of technologies of cooperation, but they don't provide theoretical criteria that ground the typology and the differences of these technologies. Furthermore, no distinction between cooperating machines (in the case of self-organizing mesh networks and community computing grids) and cooperating humans (in the case of the other five technologies) is made.

Information is a threefold process of cognition, communication, and cooperation (Hofkirchner 2002, Fuchs & Hofkirchner 2005). A single individual (cognitive level) connects him or herself by using certain mediating systems to another individual, and a feedback is established (communication). From communication processes a system of shared or jointly produced resources can emerge (cooperation). Networked computer technology enables cognition, communication, and cooperation processes that are spatially disembedded and may be temporally synchronized. The level of information (cognition, communication, cooperation) and the type of temporality characterize networked computer technologies. Synchronous temporality means that users are active at the same time ("in real time"), and asynchronous temporality means that the users' actions are temporally disembedded. In both cases technology enables a spatial disembedding of users.

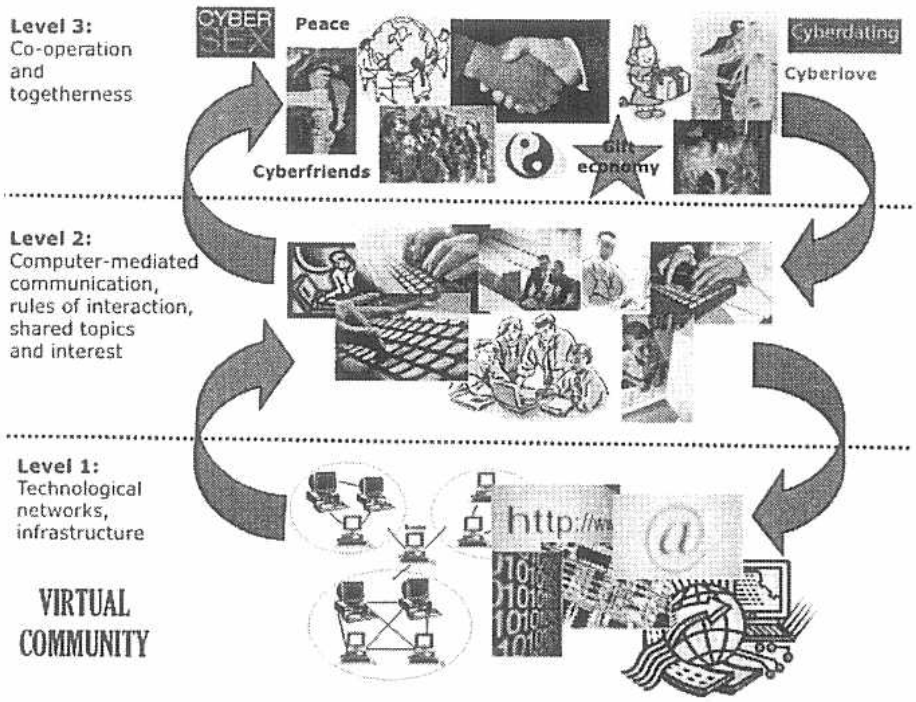

Figure 2: The three levels of virtual community

Another aspect of network technologies is the type of relationship that they enable: one-to-one-relationships (o2o), one-to-many-relationships (o2m), or many-to-many-relationships (m2m). The o2o technologies allow one user to reach one other, o2m-technologies allow one to reach many others, and m2m-technologies allow many users to reach many others. The following table provides a typology of computer technologies that can be used as the material foundation for virtual communities.

Level 2 of Virtual Communities: Computer-Mediated Communication

On the second level of virtual community, networked computer technologies are used for communication, and the social level of the virtual community is established. Online communication, based on certain technologies, forms a community if it is continuously repeated. Hence the common aspect

here is continuous usage and a continuous interest in communicating online with others. At this level continuous online communication is required, but not consensus or common values. Also specific guiding structures, rules of interaction (netiquette, chatiquette) emerge.

A virtual community is a global socio-technological system based on a technological structure consisting of computer networks that store objectified human knowledge. Human actors permanently recreate this global knowledge storage mechanism by producing new informational content, communicating in the system, and consuming existing informational content in the system. The technological infrastructure enables and constrains human communication. This is a self-organization process where a structural level (the virtual part) and an actor level (the social or community part) permanently create each other (Fuchs 2003a, b). It is a self-referential loop of self-organization (see Fig. 3): In a top-down process the existing technological structure that stores objective human knowledge enables human activity. There is the subjectification of objective knowledge in human brains when one consumes knowledge that is represented in the Internet or communicates with other human beings via the Internet.

In this sense the technological structure mediates human activities and results in emergent aspects of thinking and action. In a bottom-up process human beings communicate and act in such a way that the knowledge stored by the technological structure change is actualized and extended. Here objective knowledge emerges from the cooperation of human actors, and the actors co-ordinate their communication in such a way that parts of their subjective knowledge are synergistically shared and coordinated so that new embedded and objectified emergent knowledge that is stored in the technological structure appears. This double process of bottom-up-emergence of objective knowledge and top-down-emergence of subjective knowledge constitutes the basic productive loop that is characteristic for the self-organization of a virtual community.

A virtual community consists of both a technological infrastructure and communicating human actors. The technical structure is medium and outcome of human agency; it enables and constrains human activity and thinking and is the result of productive social communication processes. The technological structure/part of a virtual community enables and constrains human communication and is itself produced and permanently reproduced by the human communicative part. A virtual community consists of a technological and a social part that both have a networked character. The character of the virtual community is both determined by the type of technological ap-

	Synchronous	Asynchronous
Cognition	Peer-to-peer networks for file sharing (o2o, m2o, o2m)	Websites (o2m), social book marking (o2m, m2m), social citation (o2m, m2m), electronic calendar (o2m), online journals (o2m, m2m), alternative online publishing (*e.g.* Indymedia, Alternet, o2m, m2m), online archives (o2m, m2m), e-portfolio (o2m), Internet radio/podcasting (02m) Real Simple Syndication (RSS, o2m)
Communication	Chat (o2o, o2m, m2m), instant messaging (o2o, o2m), Multi User Dungeons (MUDs) (o2o, o2m, m2m), MUDs Object-Oriented (MOOs) (o2o, o2m, m2m), graphical worlds (o2o, o2m, m2m), voice over IP (o2o, o2m, m2m), video conferencing systems (o2o, o2m, m2m)	E-mail (o2o, o2m), mailing-lists (m2m), bulletin board systems (usenet, m2m), web-based discussion boards (m2m), blogs (o2m, m2m), video blogs (v-blogs)/photo blogs (o2m, m2m), group blogs (m2m), social network services (*e.g.* online dating and friendship services like MySpace.com, o2o), social guides (o2m, m2m), mobile telecommunication (*e.g.* SMS and cellular phones; o2o, o2m), online rating, evaluation, and recommendation systems (*e.g.* tripadvisor, eBay- and Amazon.com Market Place-user ratings, listing of similar items at Amazon.com, o2m, m2m)
Cooperation	Synchronous groupware (collaborative real-time editing shared whiteboards, shared application programs, m2m)	Wikis (m2m), shared workspace systems (*e.g.* BSCW) (m2m), asynchronous groupware (m2m), knowledge communities (*e.g.* Wikipedia)

Table 3: A typology of virtual community technologies

plications employed and by the interests and practices of the users. Together these two parts form a socio-technological system. The technological structure functions as a structural mass medium that produces and reproduces networked communicative actions and is itself produced and reproduced by communicative actions. The technological aspect of a virtual community functions as a reflexive medium of human cognition, communication, and cooperation.

Contemporary virtual communities are technologically mediated systems where different interpretations of the world (meanings) of individuals meet. What the users share is not only certain technological standards, but also an interest in using certain applications for certain overall goals. These interests can be economic, political, or cultural. So for example, users of an online auction system all share the interest in selling or buying used or new goods and achieving a good price. Users of online-dating systems all share an interest in learning to know and love others. Users of Wikipedia all share the interest in producing open encyclopedia knowledge. Users of a political online discussion board all share an interest in certain political topics. Users of a scientific mailing list all share an interest in a certain topic such as Internet research in the case of the air-list (Association of Internet Researchers). Community on this level of analysis acquires the meaning of not only shared technology, but also shared general interests and topics of communication. The next table distinguishes three types of virtual community based on the dominant topic of interest and communication.

Type of VC	Quality
Economic virtual communities	Shared interest of selling or buying goods in online auctions or online market places
Political virtual communities	Shared interest in politics, discussing certain political topics, or certain aspects of political worldviews
Cultural virtual communities	Shared interest in building relationships, learning to know other people, their lifestyles, and ideas

Table 4: A typology of communication topics of virtual communities

Level 3 of Virtual Communities: Cooperation and Appreciation

Modern society is characterized by an antagonism of cooperation and competition. Competition dominates social interaction, and in Post-Fordist capitalism colonizes cultural spheres of life that have, during Fordism, been more influenced by cooperation (such as friendships, everyday life, family, science, education, health, belief). One, hence, can't expect that under such conditions virtual communities are harmonious, solitary, consensus-oriented spaces that display a great deal of togetherness as expected by Tönnies and other early representatives of communitarian thinking. Virtual communities, social spaces shaped by the antagonisms of late-modern society, are characterized by both competitive and cooperative relationships. Competition (for prices and market shares of commodities) is obvious in economic virtual communities and is also rather easy to find in contemporary political virtual communities in the form of competition for better political arguments. Virtual communities are spatially disembedded and technologically mediated social spaces of continuous communication, fields where meanings—interpretations of the world—meet. These relationships take on the form of both cooperation and struggle for meaning.

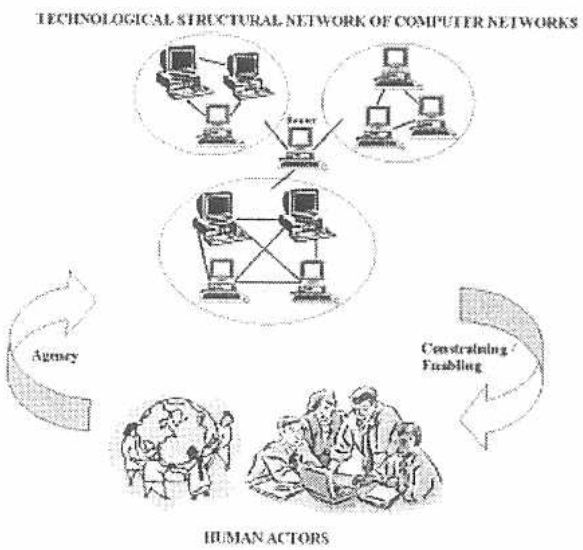

Figure 3: The Self-Organization of the Virtual Community as Socio-Technological System

Virtual communities in late-modern society are social spaces for the production of symbolic distinction and status differences. Communication in such communities is often oriented on constructing identities in opposition to the identity of other users in order to produce unique online personae that act different from others and communicate distinguishable meanings. Virtual communities today, hence, are social spaces for accumulating symbolic capital (in the sense of Bourdieu, cf. Fuchs 2003a), a capital of status, rank, and reputation that produces differences that gives single users a feeling of superiority and communicates to others the impression that they are inferior. Virtual communities are social spaces of semiotic struggles for the accumulation of differences that construct online identities.

But the competition of different world views and meanings for distinction and appreciated status is only one aspect. Another is the cooperative sharing of meaning and the joint production of new meaning online. Users

communicate interpretations of the world (whether fictitious or grounded in their own life) in virtual communities. In doing so they meet a lot of other personae communicating other meanings that signify interests, ideas, tastes, experiences, feelings, body look, etc. The quality of anonymity enables users to potentially construct meanings (virtual meanings) that don't correspond to the meanings they give to the world and that represent their bodily, social, and cognitive identities ("real life" meanings).

Participants in virtual communities not only look for difference and status, they also look for friends, new acquaintances, shared interests in culture and politics, advice, opportunities for discussion, etc. The construction of differences to other users might be used for impressing other users. In addition to competition, there is also a great deal of shared meanings and joint meaning production in virtual communities. This happens in conversations in which users discover interest in certain characteristics of other online personae (ideas, look, manner of online behavior, shared experiences, humor, shared hobbies or love for certain bands, movies, TV series, celebrities, political ideologies, destinations, etc.). It is probable that users engage in continued conversation with online persons with whom they share certain communicated meanings.

At this level virtual community acquires a new dimension beyond common technologies and common general interests. A certain degree of togetherness—an overlap of meanings—is discovered and creates attraction and continued conversations. The trajectory of such a conversation, (i.e., a common history of online persons), is undetermined and unpredictable. They might end the online contact once one discovers that the other doesn't fulfill certain expectations, they might transfer conversation to face-to-face meetings and either become friends (or even lovers) or never meet again afterwards, they might continue conversation at the virtual level for a long time, etc.

Everything is possible in the virtual world, just like in the "real" world, although online conversation requires more imagination, as it is frequently less rich in contextual information and therefore more prone to misunderstandings. Whenever online persons discover common interests and attraction, they start producing, to a certain extent, joint meanings they all agree upon. Here community acquires its original sociological sense as defined by Tönnies, Weber, and others. A virtual (*i.e.*, technologically mediated) structure of feelings is produced that is characterized by a feeling of togetherness and belonging, shared meanings and beliefs, co-constructed new meanings, common values, intimacy, emotional commitment, bonds and emotional ties, consented values and interpretations.

Not all virtual communities and not all users reach the third level; community often remains a technologically mediated space of repeated communication. Raymond Williams (1983, 75) has pointed out that etymologically, community on the one hand indicates actual social groups (in the sense of common people, state, people of a district) and on the other hand a particular quality of relationship (community of interests, community of goods, common identity and characteristics). All virtual communities and all online relations are communities in the broader first sense, but not all of them are communities in the second. The first and second level of virtual community are an expression of the first meaning of community, while the third level is an expression of the second meaning of community.

It is important to stress that virtual communities are not idyllic and harmonious; they are online arenas of cooperation and struggle. Characteristics of late-modern society such as the intense colonization of the life-world and the whole society by economic logic are reproduced in cyberspace. Hence virtual communities, in addition to being spaces of cooperation, also are colonized by competition. Cyberspace is a contested terrain. On the one hand, it is coined by the forces of commercialization and commodification. On the other hand, it also is a space for a great deal of voluntary, altruistic cooperation, as in the case of open source and open content communities, Wikipedia, online friendships, online love, etc.

Like society, cyberspace today is dominated by competition, a process that, following the theory of Jürgen Habermas, is termed colonization of virtual communities. With a reference to Marx, Howard Rheingold speaks in this context of the "notion of community as commodity" (Rheingold 2000, 341) and of the "commodification of community" (Rheingold 2000, 389). Colonization takes place, on the one hand, in the form of competition for status and prestige in VCs and, on the other hand, in the form of commodification of VCs, such as the closure of VCs and the imposition of financial access barriers that make VCs non-public (*i.e.,* freely accessible for all) spaces.

But there is a real potential for change (of both society and cyberspace) towards a future space dominated by highly cooperative communities that engage in the joint production of meaning and digital resources. Then virtual communities will not only be spaces where humans share technological standards and broad interests that structure online communication, but also social spaces of cooperation and participation from which strong ties and common identities emerge that are open, democratic, joyful and able to allow plurality. But for achieving this condition, the predominantly competitive character of society will have to be change towards much more cooperative

conditions. Some important qualities of virtual communities are:

- *Anonymity*: Communication is potentially anonymous communication.
- *Identity-building:* Anonymity enables the construction of identities online. These identities are based on and connected to the offline life; they are a continuously changing product of online activity and they feed back onto the offline world.
- *Flexible membership:* There is a non-binding membership (retreat from communication is rather easily possible).
- *General interest and topics:* There is a shared interest or context that structures communication (technology, applications, topics, rules)
- *Communication:* There is continued interaction, i.e., a certain temporal continuity of online communication.
- *Rules:* There are formal or informal conventions of online behavior, style, and language.
- *Space-time:* Communication is spatially disembedded and temporally synchronous or asynchronous.
- *Meaning:* Meaning is communicated and shared in VCs. New meaning is jointly produced and emerges from social practices and engagement with others in VCs.
- *Voluntary:* Interaction in virtual communities is voluntary.
- *Global:* Virtual communities have a global dimension.
- *No contextual queues:* In text-based VCs verbal and non-verbal forms of expression (body language, gestures, facial expression, voice pitch) can't be communicated. VCs hence are more prone to misunderstandings than face-to-face communication and require more articulation work for communicating extra knowledge that conveys feelings and the context of communication (*e.g.*, in the form of emoticons). Communicating emotions explicitly (to "emote") in text-form is a strategy for overcoming contextual limitations of CMC. Text-based CMC can result both in a neglect of the body and an increased attention to the body (Döring 2003, 287).
- *Expressive communication:* Due to the potential anonymity and a lack of non-verbal expression in text-based VCs, the Habermasian claims to validity of truthfulness (correspondence of intention and statements) and normative rightness (clarification of and agreement on the normative context of communication) are often harder to achieve online than offline. More easily than offline communication, online communication shifts into a more expressive and affective mode and is more prone to breaking normative rules of communication (as, *e.g.*, in flame wars). In order to avoid such problems,

moral rules develop in cyberspace and in VCs (netiquette, chatiquette).

- *Speed:* Relationships can become intense more quickly online than offline in a positive and a negative sense, because anonymity and the lack of visual cues encourage projection (Turkle 1997, 206sq). People feel more courageous online than offline, because they can more easily end a conversation. They feel that there are potentially fewer consequences for action in a symbolic than in a physical space, and they have more time for thinking before answering and arguing.

The lack of physical presence and visual context queues and the invisibility of the communication partners might lower inhibitions. There are lower inhibition thresholds online than offline, and one arrives at private topics more quickly (Döring 2003, 457). Online communication, in some respect, seems to accelerate social contact and social relationships, which also means that online contacts are not only quickly created, but can also be quickly abandoned. Anonymity allows masking handicaps and accentuating certain individual characteristics, which might lower inhibition (Döring 2003, 460). VCs are generally easier to join and to leave, which will result in more dynamic and continuous membership evolution (McLaughlin, Osborne & Smith 1995).

- *Social:* Communication in VCs is a social activity, but it is, in most cases, carried out physically alone in front of a screen. Max Weber argued that "action is social, in so far, by virtue of the subjective meaning attached to it by the acting individual (or individuals), it takes account of the behavior of others and is thereby orientated in its course" (Weber 1947, 88). Online communication of one individual is oriented on the messages typed/communicated by others; hence it is always a social activity. That the individuals are not physically co-present and sit alone in front of a screen doesn't mean that online communication isn't social.
- *Reflection:* In a VC other than in an offline community where people meet face-to-face, one can postpone reactions and take more time for reflection before giving answers to questions.

VCs are not necessarily global. Douglas Schuler (1996) has coined the term "community networks" for computer-mediated communication that encourages communication and participation in local communities. Examples are the Free-Nets in the U. S. and the Seattle Community Network.

> *"Community networks are an attempt to use computer network technology to address the needs of the community. A major part of that effort is spent making computing facilities available to everybody in*

a community, especially those without ready access to the technology. ... While virtually all community network systems do offer access to at least some Internet services (e-mail at a minimum) the focus of a community network is on the local community. To that end it is important to involve local organizations and individuals in a democratic process that guides both the design and the operation of the network" (Schuler 1995).

The Internet is an evolutionary system, hence new overall systemic qualities will emerge sooner or later. Terms like "Web 2.0" and "social software" indicate that many people perceive a more fundamental change of the Internet. How does this change affect virtual communities? This question will be considered in the next section.

4. Web 2.0 and Virtual Communities

In addition to information, communication and cooperation are also important aspects of the Internet. That has been stressed recently by the concepts of Social Software and Web 2.0 that focus on the transition from information consumption and publishing to applications that support more communication, cooperation, and participation on the Internet (O'Reilly 2005). Tim O'Reilly (2005) has stressed that the transition from Web 1.0 to Web 2.0 means a change from the web as a publishing platform to a tool supporting participation. Communication applications have been supported by the Internet since its beginning, but at least since the rise of the World Wide Web, it has been dominated by information provision applications.

With the rising importance of social software, the character of the World Wide Web changes; many-to-many-communication and cooperative knowledge production seem to become new dominant qualities of the web. Social software (*e.g.*, discussion boards, mailing lists, wikis, blogs) has become a central foundation of Internet activities. "Social software is a set of tools that enable group-forming networks to emerge quickly. It includes numerous media, utilities, and applications that empower individual efforts, link individuals together into larger aggregates, interconnect groups, provide metadata about network dynamics, flows, and traffic, allowing social networks to form, clump, become visible, and be measured, tracked, and interconnected" (Saveri, Rheingold & Vian 2005, 22).

Maria Bakardjieva (2005) distinguishes between a rationalistic model of Internet communication and committed online communities. In the first model users focus on finding information for instrumental reasons, and in

the second the central value is sociability, where an important characteristic is interpersonal commitment. The first would be a consumption model of the Internet, the other a community model. "The qualitative distinction between the two models lies in the absence or presence of users' involvement with one another" (Bakardjieva 2005, 180). I think that these two social models can be mapped to the two versions of the web: Web 1.0 was more oriented on infosumers, Web 2.0 is more oriented on community or what Bakardjieva calls virtual togetherness. Hence Web 2.0 seems to be closer to the idea of virtual communities than Web 1.0.

A blog is a website on which users can post messages that are chronologically stored and other users can comment on these entries. It is a sort of online diary that has public character that breaks down the border between private and public. The main difference between mailing lists/newsgroups and a blog is that a blog is always Web-based and archived in reverse chronological order (newest entries first). A wiki is a dynamic website on which all pages can be edited by all users with the help of special editing tools in which users make use of a wiki markup language.

In the self-organization of the World Wide Web, what permanently emerges are new websites and links. The users permanently browse websites and links and hence give meaning to the provided data (Fuchs 2005). In newsgroups and mailing lists, self-organization means the dynamic emergence of new postings and replies. In blogs self-organization is achieved by the emergence of new postings by one author in an individual blog and by many authors in group blogs, by the browsing of entries, and by the production of comments to postings by many users. In a wiki self-organization is achieved by permanent changes to content pages by many different authors, and new pages of text emerge dynamically.

The entity that is permanently produced and reproduced is the overall hypertext structure in the WWW—postings, mailing lists, blogs, and content pages. The World Wide Web and wikis are page-centred, but a single wiki page is much more dynamic than most webpages and allows many/all users to permanently make changes, whereas ownership of a webpage is individualized. If one could compare technologies metaphorically to political systems, then a webpage would be close to the capitalist idea of the individual property means of production and wikis close to the communist idea of the public property means of production. Mailinglists, newsgroups, and blogs are post-centred. Individual contributions take the form of single messages, and single-author comments are the units of reproduction for the overall system.

Table 5 shows some differences between webpages, newsgroups, mailing

lists, blogs, and wikis. A push medium is a communication system in which the user is automatically provided with new information; a pull medium is a communication system in which the user must take some activity (*e.g.*, opening a website or a discussion board) in order to receive information. There are three aspects of knowledge (cf. Fuchs & Hofkirchner 2005): cognition (information), communication, and cooperation. Higher-level forms of knowledge have lower-level forms of knowledge as a necessary precondition and show emergent qualities.

Webpages are mainly tools for publishing and reading information; mailing lists, newsgroups, and blogs support cognition as well as communication; and wikis are tools of cognition and communication as well as systems of human cooperation for shared knowledge production. The information flow can be one-to-one (o2o), one-to-many (o2m), and many-to-many (m2m). The content data can be stored on a server where it is archived or not stored, but only distributed to subscribers (who store the data locally on their hard drives). Each application type has its own mode of editing information that allows a different number of users (from one to many or all) to change content.

Some important aspects of social software and Web 2.0 are:

- ***Many-to-many communication:*** Social software enables many users to reach many recipients; each receiver can be a sender of information, each consumer a producer. The dialectical figure of the prosumer emerges.

- ***Cooperation:*** Wikis enable users to collaboratively produce digital knowledge without being physically co-present. Users read existing texts or create new ones (cognition); they discuss how texts can be changed, appended, and enhanced (communication); and they together produce new content (cooperation).

- ***Open source/content:*** The wiki software is open source; wiki pages are open content, so everyone in a user group can access and edit them. People write wikis not to earn money, but because they want to share knowledge. The motivation for producing wikis is social, not economic. Large wikis like the Wikipedia attract interest by being freely available on the Internet; one doesn't have to pay for accessing and editing it. Hence the knowledge of Wikipedia and other open content projects isn't a commodity from which economic actors derive profit. It transcends the instrumental logic of accumulation, profit, competition, and commodification and is based on an ethos of cooperation, public goods, and shared knowledge that constitutes a new logic,

	Website	Newsgroup	Mailing List	Blog	Wiki
Push/Pull Medium	Pull	Pull	Push	Pull	Pull
CnCmCp	Cognition	Cognition, Communication	Cognition, Communication	Cognition, Communication	Cognition, Communication, Cooperation
Information flow	o2m	m2m	m2m	o2m, m2m	m2m
Information Storage	On Server	On Server	Not automatically, only if a web-archive is available	On Server	On Server
Editing	Website can only be changed by one user or group of users	Each user is able to add new postings and to add comments to other postings in a thread	Each user is able to make new postings to the list and to answer to other postings	In individual blogs one user is able to post messages and others are able to post replies and comments to original postings. In group blogs many or all users are able to post messages and to reply to messages	All pages can be changed by all users
Unit of production and reproduction	Hypertext	Posting	Posting	Posting	Wikipage

Table 5: Differences of websites, newsgroups, mailinglists, blogs, and wikis

the one of a gift economy.

However, that wikis and open content projects are non-commodified should not be taken for granted. One can imagine that such systems are suddenly colonized by capitalist logic, that their knowledge is sold in order to accumulate money capital. Non-commodified open content projects are what Jürgen Habermas has described as life world-spheres of communicative action that enable rational cooperation, but are threatened by the influence of the steering media money (commodification, big business) and power (bureaucratization, big power). This would mean that all active users have produced surplus value for absolutely no wage. Such a strategy would be an extremely sophisticated and perfidious way of exploiting knowledge labor. But such an ideology would probably also put an end to such projects because for many users the non-proprietary character and free availability of open content knowledge is a driving factor for their commitment.

- ***Real participation vs. participation as ideology:*** Stephen Coleman (2005) argues that blogs can help establish a new politics of listening in which everyone has a voice. They can become "sophisticated listening posts of modern democracy" and sources "of nourishment for a kind of democracy in which everyone's account counts" (Coleman 2005, 274). A centralized control of public opinion by totalitarian regimes or market forces (as in the case of private media monopolies) can be undermined by Internet platforms that pose opportunities for alternative information and communication.

Social software, due to its ability to support many-to-many-communication, has a potential for acting as a tool that helps establish a more participatory democracy in which decisions are discussed and taken by those affected by them. It can also strengthen the voices of civil society, helping to create alternative public spheres critical of dominant societal structures and to communicate protest. Hence social software can act as a tool supporting cyber protest (cf. Fuchs 2006).

Chris Atton (2004, 26) speaks in this context of an alternative Internet that creates a counter-public sphere and is "opposed to hierarchical, elite-centred notions of journalism as a business." But for all of these positive developments, institutional changes are needed first. Social software is not automatically progressive. It can be used for advancing democracy just as easily as fundamentalism, right-wing extremism, and terrorism.

The impact of social software on the political system depends on the societal embeddedness of technology. Blogs can be appropriated by politicians,

parties, and the representative political system for giving voice to the people without listening or giving people a say in political decisions. Blogs can communicate political ideas and give the illusionary impression that people can make a difference, though in reality they can't influence policies. In such a case blogging becomes an ideology and an expression of repressive tolerance (Marcuse 1969). Social software can support grassroots digital democracy just like it can support representative and plebiscitarian forms of digital democracy. It is an ethical and political choice which of these models one considers as more desirable and democratic.

Blogs that are used mainly for the communication of politicians with citizens within the existing representative institutions and without establishing more participatory institutions (not used for citizen-citizen-communication) are not a form a participatory digital democracy, but of representative digital democracy. In the U. S. Presidential pre-elections in 2004, Howard Dean was very successful in mobilizing supporters and funds by making use of blogs (Kline & Burstein 2005). The blog of the Bush campaign, while successful, didn't invite comments from readers (Kline & Burstein). This shows that social software can be incorporated into big politics (as well as big business) and can result in a destruction of its participatory potentials. In such cases social software is colonized in the Habermasian sense of the word by power and money.

Social software can have empowering effects if it is used as a tool for communication and cooperation in civil society. David Kline and Dan Burstein (2005, xiv) argue that blogging can contribute "to restoring the lost voice of the ordinary citizen in our culture" and that it can broaden "the range of voices and issues for political debate."(Kline & Burstein 2005, 9) There is certainly a potential of social software to support the rise of alternative public spheres, but this is not technologically determined. There is no technological fix to the lack of institutions that guarantee political participations. Technological tools, and most importantly, institutional reforms are needed. There is no automatism in the effects of blogging, it will not as Kline and Burstein claim "inevitably lead to a strengthening of the civic mindedness of the citizenry" (Kline & Burstein 2005, 11). The effects of technology are not determined, as techno-deterministic positions argue. They depend on the social embededdness and construction of technology.

- ***Self-organized structures:*** Open content projects based on social software are in many cases not controlled by an elite group that takes decisions, but by self-managed networks of activists.

- ***Citizen journalism vs. corporate journalism:*** In journalism blogs can be an opportunity for marginalized voices to be heard and listened to, because blogging doesn't require much capital as establishing a newspaper does. All citizens can, in principle, become journalists by political blogging. Dan Gillmor in this context considers blogs as online grassroots journalism. He argues that they "can be acts of civic engagement" (Gillmor 2006, 139) and establish a "read/write Web" (24). For Chris Atton a blog is a less reticulated and less social movement-minded version of alternative online media that applies "similar principles of native reporting, media critique, discussion and dialogue amongst its writers and readers" (Atton 2004, 55).

However, that everyone is, in principle, able to post political ideas in a blog doesn't mean that he or she will be heard and listened to. Blogging today is controlled by media corporations and political elites and takes place in a hierarchical and stratified society in which public attention can be bought. Hence a blog run by established actors might be more listened to than one by marginalized actors. Widespread blogging alone doesn't solve the problem that there is a lack of political participation. Institutional reforms of society are needed—as well as technological change—that can support, but not substitute such reforms. Social software, like blogs, can challenge and weaken the domination and monopolization of political information and communication by large media corporations that commodify and industrialize culture. However, it is not determined that it has positive effects on the public sphere.

- ***Collective intelligence:*** A wiki is more than the knowledge of single individuals and more than the agglomeration of knowledge of many single individuals. Due to cooperation, knowledge emerges that is more than the sum of the knowledge of the contributors, and as a new quality has a shared perspective to which the contributors all agree. Pierre Lévy (1997) has termed the new quality of such emergent knowledge systems Collective Intelligence.

Some people argue that blogging is an inherently self-centred activity without political relevance. This might indeed be the case for individual blogging that supports the dominant idea of distinctive lifestyles as strategy for accumulating symbolic capital, but there is a more radical potential in group blogs and the political usage of blogs. There are many examples of the influence political blogs, such as their role in the debate on the French plebiscite on the European constitution in 2005, the protests against the deregulation of dismissal protections for young French people in 2006, the Iraq war (War-

Blogs), in communicating political opposition in Iran, or in the U. S. Presidential elections in 2004. Richard Kahn and Douglas Kellner (2004) argue that the political developments after 9/11 have produced a social movement that makes use of the Internet for political activism. These activities will transform the Internet itself and result in phenomena such as political blogs that form a "vital new space of politics and culture" (Kahn & Kellner 2004: 94).

The blogosphere is the "world of blogs as a collective group" (Kuhns & Crew 2006, 7), "an alternative universe created by the aggregation of hundreds of thousands of blogs." A network of blog systems, blogs are interrelated by permalinks and can be indexed, searched, and assessed with the help of meta-blog-systems, such as Technorati, Feedster, Bloglines, Blogpulse, Pubsub or Blogdex.

More dynamic than Web 1.0, Web 2.0 is self-organized change is its very nature. It is more connected to cooperation and hence has a potential to realize the third level of virtual communities. In order to show how the process of self-organization works in Web 2.0, I will now discuss an example: the open source encyclopedia, Wikipedia.

5. Wikipedia as a Self-Organizing Virtual Community

Wikipedia is an open-content encyclopedia that can be read and edited by everyone having access to the Internet. Based on the wiki-technology, it is written collaboratively by volunteers, as there are no access barriers. It was started in 2001 by Larry Sanger and Jim Wales and was planned as a more open alternative to Nupedia, a peer-reviewed online encyclopedia. Wikipedia is freely available, easily accessible, simple, can be edited by everyone, is non-commercial and open content, fosters participation and communication of users, is based on the idea of the free sharing and joint production of knowledge, and allows up-to-date information. It is social software that advances interaction and cooperation of users.

Ward Cunningham introduced the wiki concept in 1995 (cf. Cunningham & Leuf 2001), as an easy way for the collaborative online production of knowledge. The term "wiki" is Hawaiian and means "quick." In January 2006 Wikipedia had more than 2.5 million articles, including more than 0.9 million in the English-language version, and more than 0.7 million registered users. There are over 200 language versions of Wikipedia. In terms of the number of articles, English is the largest version, followed by the German version.

Referring to Wikipedia in press articles has become quite widespread. By adding articles to a watch list, Wikipedians can monitor how an article changes, so that they can make new contributions if they feel that problems

arise or the article should evolve in another way. Wikipedians can create a personal identity through their user-page, on which they can provide biographical information and links to articles they have worked on. Also a discussion page, the "talk page," is associated with each user-page. Users can contribute to articles anonymously, and if they register they can create a user-page and a watch list. Talk pages are also used to publicly express recognition of good articles and contributions.

Featured articles are displayed for one day on the Wikipedia start page; these are articles that are considered to represent the best work done on Wikipedia. Works can be nominated as featured articles and are discussed by community members. Finally votes are taken to determine whether to feature certain articles. Each Wikipedia article has a version history, so different versions can be compared. It just takes one click to restore an older version, so vandalizing can easily be undone. Wikipedia is an open content project, which means that its content can be reused, improved, manipulated, and distributed if the new source is again an open content document. This idea stems from the Open Source software movement that has gained a broader meaning. Wikipedia is licensed under the GNU Free Documentation License provided by the Free Software Foundation.

As Wikipedia is a relatively new evolving networked collaboration space, Wikipedia research is also a newly emerging field (cf. *e.g.*, Benkler 2002; Bryant, Forte, Bruckman & Cedergren 2003; Ciffolillo 2003; Emigh & Herring 2005; Kolbitsch & Maurer 2005; Lih 2004; Ma 2005; McKiernan 2005; Stadler & Hirsh 2002; Voss 2005; Winkler 2003). Susan L. Bryant, Andrea Forte, and Amy Bruckman (2005) interviewed nine Wikipedia users and they found that novices are concerned with correcting individual articles, whereas long-term users are more concerned with offering knowledge to the global public and strengthening the Wikipedia community. Lih (2004) compared Wikipedia articles before and after they had been cited in the mass media, and found that press citation increased the quality of Wikipedia articles. Quality was defined in this study as the number of edits and the number of unique contributors for each node. William Emigh and Susan C. Herring (2005) measured the formality of Wikipedia articles and found that the articles mostly use formal language, avoid informal and colloquial features, and are "stylistically homogenous, typically describe only a single, core sense of an item, and are often presented in a standard format that includes labeled section headings and a table of contents." They conclude that the style of Wikipedia is statistically indistinguishable from print encyclopedias.

Andrea Ciffolilli (2003) characterizes Wikipedia as a purpose-built virtual

community that aims at creating a public good. Lih (2004) sees it as an example of participatory journalism, Stalder and Hirsh (2002) as example of open source intelligence. Magnus Cedergren (2003) argues that Wikipedia users find it stimulating to work together with others, want new knowledge, like the possibility for feedback, have an intrinsic motivation, are altruistic, see Wikipedia as a possibility for publicity, and want to provide benefits for the end user. The number of Wikipedia articles has been growing exponentially, because more content leads to more traffic, which leads to more edits, which generate more content (Ma 2005; Voss 2005). Voss (2005) conducted a statistical analysis of Wikipedia and found that the number of distinct authors per Wikipedia article follows a power law distribution and that the link-network of Wikipedia is scale-free on ingoing links, outgoing links, and broken links.

The main criticism on Wikipedia is that because it is not peer-reviewed, it lacks quality assurance and can easily be vandalized and attacked. Kolbitsch and Maurer (2005) argue that vandalism and edit wars are negative aspects of Wikipedia, and mechanisms to approve the expertise of authors or to verify the authenticity of descriptions do not exist. Due to the dynamic nature of Wikipedia, its articles wouldn't be useful as references or for quotation. The general counter-argument by Wikipedians to such criticism is that watch lists and engaged users allow the immediate correction of acts of vandalism and that cooperation is a good principle for achieving good quality.

In December 2005 the mass media reported that a Wikipedia article on John Siegenthaler, Sr., a founding editor of *USA Today*, included erroneous information that linked him to the Kennedy assassinations (New York *Times*, December 4th, 2005). The fake poster, Brian Chase, admitted that he planted the reference as a joke. Due to this story some stakeholders questioned the reliability of the information on Wikipedia. In the same month an article in the prominent journal, Nature, that compared the quality of selected Wikipedia articles to articles on the same topic in the Encyclopedia Britannica concluded: "Wikipedia comes close to Britannica in terms of the accuracy of its science entries" (Giles 2005). This discussion shows that the quality of Wikipedia is a contested issue.

The research on Wikipedia conducted thus far has mainly concentrated on the formulation of hypotheses, the documentation of Wikipedia's history, statistical analyses of Wikipedia, and small-scale interviews. A more theoretical explanation of Wikipedia is missing. I want to briefly outline how Wikipedia can be conceived as a dynamic, self-organizing system in which structures and human communicative actions are of importance. Marco Kalz (2005) argues that a framework theory for Wikipedia research is missing and sug-

gests that Giddens' structuration theory could act as such a meta-theory and that a combination of self-organization theory and structuration theory could be helpful in concrete Wikipedia research. My own social theory is based on a combination of dialectical structuration theories (Giddens, Bourdieu) and self-organization theory (Fuchs 2003a, 2003b). The central task for a framework theory is to first show how (and which) structures and communicative practices are interconnected and mutually produce each other in Wikipedia. The advantage of such a theoretical approach is that it allows a description of wikis as a dynamic, permanently changing communication system that grasps the characteristics of the Internet and online communication.

Which role do technological, economic, political, and cultural structures play in Wikipedia? The technological foundations of Wikipedia are the servers that store its information and the wiki-software. A certain amount of money for financing the technological infrastructure and a few employees is required. Funding is mainly achieved by donations. Wikipedia doesn't accumulate economic capital, it is not financed by selling commodities or advertisements. Its content is freely accessible, it is not sold, and hence it negates the idea of economic money capital. Wikipedians work for free.

Wikipedia could be turned into a commodity, which means that all the labor that has been done for free could be transformed into surplus labor. If access to Wikipedia were suddenly sold as a commodity, a tremendous amount of surplus value would have been produced without requiring any wages. It is unlikely that this will happen, but if it were the case this would be a perfidious and sophisticated strategy for exploiting knowledge work. But most probably such a move would also put an end to the commitment of many users who value the open, altruistic, and cooperative character of Wikipedia. Wikipedia is a cultural resource, a knowledge system that is constituted by the dynamic interrelation of ideas of individuals that communicate and cooperate in order to produce articles. Wikipedia articles emerge from the knowledge of cooperating individuals; articles are emergent knowledge because they comprise many ideas and facts that the group of producers finds important and wants publish.

What Bourdieu has termed political or social capital refers to social relationships. These are established in Wikipedia when communicating how articles should be structured, in the discussion boards that accompany articles, in the personal talk pages of users, and in Wikipedia mailing lists. Reputation as a symbolic structure also plays a role in Wikipedia, because users who are very active and help others are respected. A list of the most active users has a certain symbolic value. In Wikipedia, value is mainly symbolic and cultural,

not material and economic; what is accumulated is not money capital, but knowledge and to a certain extent reputation. Reputation in Wikipedia is not gained by individual performance, because production in Wikipedia is social. Rather, it is gained by cooperating with and helping others.

User groups are another symbolic aspect (in terms of rank and roles) of Wikipedia. User groups include banned users, bots, anonymous users, registered users, ambassadors, and mediators. Administrators can remove vandalism from page histories, block IP addresses from editing, and edit secure pages such as the main page. Arbitrators mediate conflicts and can ban individuals, developers write MediaWiki software, stewards can set (give and remove) arbitrary user access (sysop, bureaucrat, steward, and bot) levels, and bureaucrats have the technical ability to give other users adminship. Jim Wales has authority in policy decisions and acts as a "benevolent dictator." Becoming an administrator or arbitrator is not difficult. Being active in Wikipedia will create trust, and users welcome people who want to do organizational work.

Moral rules are the cultural and political aspects of Wikipedia (Wikiquette) that structure communication and cooperation, such as the neutral point of view policy—articles should be written without bias and represent all views fairly, and debates should be described fairly without advocating any side. Rules also state that users who act inappropriately are banned, one should assume good faith, be polite, treat others as one wants to be treated by them, be prepared to apologize and forgive, give appreciation and praise when due, register (i.e. establish an identity and not remain anonymous) before contributing, argue facts instead of personalities, work towards agreement, avoid reverts and deletions if possible, answer questions, etc. (http://en.wikipedia.org/wiki/Wikipedia:Wikiquette). Anonymous contributions are considered rather suspect. The Wikiquette defines norms of good behavior based on the spirit of cooperation.

The technological structures of Wikipedia form the first level of virtual community, enabling social interactions. The emergence of knowledge and rules take place at the second level. To many users, Wikipedia offers the appeal of community, and they argue that there is an overarching societal goal: "offering [publicly available] knowledge to the world at large" (Bryant, Forte & Bruckman 2005). Here the third level of community is reached: values, feelings of togetherness, and common goals.

Technological (servers, wiki software), economic (donations, open source goods), social (existing social relationships), cultural (knowledge, values), and symbolic (reputation and roles) structures are the foundation for human

activities in Wikipedia. They enable and constrain cognition, communication and cooperation. In cognition processes, users read Wikipedia articles. In communication processes, they debate with others in talk pages, discussion pages, and mailing lists on various issues concerning Wikipedia and on how articles should be structured. Watch lists allow users to monitor changes to certain entries so that they can undo vandalism of articles to which they have contributed or to engage in discussions if changes are made that they don't welcome. New qualities of Wikipedia emerge from human activities (writing a completely new entry, discussing with others, editing existing entries). New knowledge is added, and structures are reproduced, changed, and enhanced. This is a permanent, dynamic self-organization process in which Wikipedia structures and Wikipedians' actions mutually produce each other in self-referential, circular, reflexive processes. The self-organization of Wikipedia is based on the permanent emergence of new knowledge and the browsing of existing knowledge. Wikipedia is grounded in human social action that produces and reproduces knowledge structures and rules and resources that enable the existence of the overall system.

6. Conclusion

In the introduction research questions were posed that can now be answered.

How can approaches on virtual community be classified?

There are (intersubjective) approaches that stress that VCs are constituted by continuous computer-mediated communication. There are objective approaches that see VCs as structured by moral values that produce virtual togetherness, or as computer technology-driven systems of communication, or as online market places. Dialectical approaches stress that both structures and communicative practices are important for the constitution and reproduction of VCs.

What is a virtual community?

In my own theoretical concept, a VC is a dynamic system based on computer networks and application programs (level 1). It enables continuous computer-mediated communication that is regularized and structured by general rules of interaction, shared interest, and general topics of interaction (level 2). From continuous computer-mediated communication cooperation, feelings of togetherness and belonging, shared identity, and common values can emerge level 3. This level is not reached in all virtual communities; many

are structured by competition and the accumulation of reputation and difference. Wikipedia is an example of a VC that has a spirit of cooperation and sharing.

How can a virtual community be considered a dynamic system?

The notion of social self-organization can be employed for describing and analyzing complex dynamic systems. My own theoretical notion of social self-organization is based on the productive dialectical interconnection of social structures and communicative practices and is related to ideas of Anthony Giddens and Pierre Bourdieu. In the self-organization process of a virtual community, technology enables and constrains human cognition, communication, and cooperation. This produces knowledge which is stored and transmitted with the help of the technological infrastructure, which again enables further interaction, etc. Virtual communities are dialectical systems in which technological networks and social networks are interconnected and produce each other in a self-referential loop.

What are the differences between Web 1.0 and Web 2.0?

Web 1.0 was dominated by the World Wide Web, an application that opened the Internet to a huge amount of users and focuses on information provision. Web 2.0 is based on social software that enables human communication and cooperation at a distance. The self-organization of Web 1.0 is based on hyperlinking and the individual ownership of text, whereas the self-organization of Web 2.0 is more based on communication platforms, wikis, blogs, and the collective ownership and production of text.

works. http://www.scn.org/ip/commnet/iwdec.html.

Schuler, D. (1996). *New Community Networks: Wired for Change*. Reading, MA: Addison-Wesley.

Sennett, R. (1998). *The Corrosion of Character: Personal Consequences of Work in the New Capitalism*. New York: W.W. Norton.

Stadler, F. & Hirsh, J. (2002). "Open Source Intelligence." *First Monday*, 7(6).

Stone, A. R. (1991). "Will the Real Body Please Stand Up?" In M. Benedikt (Ed.), *Cyberspace: First Steps* (pp. 81-118). Cambridge: MIT Press.

Tönnies, F. (1988). *Community & Society*. New Brunswick, NJ: Transaction Books.

Turkle, S. (1997). *Life on Screen: Identity in the Age of the Internet*. New York: Touchstone.

Van Dijk, J. (2006) *The Network Society*. London: Sage.

Voss, J. (2005). *Measuring Wikipedia*. Paper presented at the *International Conference of the International Society for Scientometrics and Informetrics 2005* (ISSI 2005). Online Preprint: http://eprints.rclis.org/archive/00003610/01/MeasuringWikipedia2005.pdf.

Weber, M. (1947). *The Theory of Social and Economic Organization*. London: Hodge.

Weber, M. (1968). *Economy and Society*. New York: Bedminster Press.

Wellman, B. (2001). "Computer Networks as Social Networks." *Science*, 293, 2031-2034.

Wellman, B. & Haythornthwaite, C. (Eds.). (2002). *The Internet in Everyday Life*. Malden: Blackwell.

Williams, R. (1983). *Keywords*. New York: Oxford University Press.

Winkler, Stefan (2003) Selbstorganization der Kommunikation Wissenschaft – Öffentlichkeit im virtuellen Raum. Koblenz. Forschungsstelle Wissenstransfer. Schriften zur Kommunikation Wissenschaft-Öffentlichkeit 1.

Dr. Christian Fuchs is an assistant professor for Internet & Society at the ICT&S Center: Advanced Studies and Research in Information and Communication Technologies & Society at the University of Salzburg in Austria. Dr. Fuchs studied computer science at the Vienna University of Technology from 1994-2000; completed doctoral studies in technical science in 2000-2002, specializing in the fields of sociology of technology, technology assessment and self-organization. He was a lecturer and research associate at the Institute of Design and Technology Assessment at the Vienna University of Technoloy from 2001 to 2004, and was a research assistant in the INTAS-project: "Human Strategies in Complexity."

References

Atton, C. (2004). *An Alternative Internet*. Edinburgh: Edinburgh University Press.

Bakardjieva, M. (2005). *Internet Society: The Internet in Everyday Life*. London: Sage.

Bakardijeva, M. (2003). "Virtual Togetherness." *Media, Culture & Society*, 25(3), 201-313.

Balasubramanian, S. & Mahajan, V. (2001). "The Economic Leverage of the Virtual Community." *International Journal of Electronic Commerce*, 5(3), 103–110.

Baym, N. K. (2006). "Interpersonal Life Online." In L. Lievrouw & S. Livingstone (Eds.), *Handbook of New Media* (pp. 35-54). London: Sage.

Baym, N. K. (2000). *Tune In, Log On: Soaps, Fandom, and Online Community*. Thousand Oaks: Sage.

Baym, N. K. (1998). "The Emergence of On-line Community." In: Jones (1998). pp. 35-68.

Beck, Ulrich (1983) Jenseits von Klasse und Stand? Soziale Ungleichheit, gesellschaftliche Individualisierungsprozesse und die Entstehung neuer sozialer Formationen und Identitäten. In: Kreckel, Reinhard (Ed.) (1983) Soziale Ungleichheiten. Soziale Welt Sonderband 2. pp. 35-74.

Bell, D. (2001). *An Introduction to Cybercultures*. London: Routledge.

Benkler, Y. (2002). Coase's Penguin, or, Linux and the Nature of the Firm. *The Yale Law Journal*, 112(3), 369-446.

Bryant, S., Forte, A., & Bruckman, A. (2005). *Becoming Wikipedian: Transformation of Participation in a Collaborative Online Encyclopedia*. Paper presented at the GROUP International Conference on Supporting Group Work 2005. Online: http://www.cc.gatech.edu/~aforte/134-Bryant.pdf.

Calcutt, A. (1999). *Whitenoise: An A-Z of the Contradictions in Cyberculture*. New York: St. Martin's Press.

Castells, M. (2001). *The Internet Galaxy*. Oxford: Oxford University Press.

Castells, M. (2000). *The Rise of the Network Society*. New Edition. Malden: Blackwell.

Cedergren, M. (2003). Open Content and Value Creation. *First Monday*, 8(8).

Ciffolilli, A. (2003). "Phantom Authority, Self–selective Recruitment and Retention of Members in Virtual Communities: The Case of Wikipedia." *First Monday*, 8(12).

Coleman, S. (2005). "Blogs and the New Politics of Listening." *The Political Quarterly*, 76(2), 273-280.

Cunningham, W. & Leuf, B. (2001). *The Wiki Way: Quick Collaboration on the Web*. Reading, MA: Addison-Wesley.

Döring, N. (2003). *Sozialpsychologie des Internet*. Göttingen: Hogrefe.

Emigh, W. & Herring, S. C. (2005). *Collaborative Authoring on the Web: A Genre Analysis of Online Encyclopedias*. Proceedings of the 38th Hawai'i International Conference on Systems Sciences (HICSS-38). Los Alamitos. IEEE Press.

Etzioni, A. & Etzioni, O. (1999). Face-to-face and Computer-mediated Communities: A Comparative Analysis. *The Information Society*, 15(4), 241-248.

Fairclough, N. (2003). *Analysing Discourse: Textual Analysis for Social Research*. London: Routledge.

Featherstone, M. & Burrows, R. (Eds.). (1995). *Cyberspace, Cyberbodies, Cyberpunk*. London: Sage.

Fernback, J. (1997). "The Individual Within the Collective: Virtual Ideology and the Realization of Collective Principles."

Fernback, J. (1999). There is a There There: Notes Towards Definition of Cybercommunity. In Jones, Steven G. (Ed.), *Doing Internet Research* (pp. 203-220). Thousand Oaks: Sage.

Fuchs, C. (2006). The Self-Organization of Cyberprotest. In Morgan, K., Brebbia, C. A. & Spector, J. M. (Eds.), *The Internet Society II: Advances In Education, Commerce & Governance* (pp. 275-295). Southampton/Boston: WIT Press.

Fuchs, C. (2005). The Internet as a Self-organizing Socio-technological System. *Cybernetics & Human Knowing*, 12 (3), 57-81.

Fuchs, C. (2003a). "Some Implications of Pierre Bourdieu's Works for a Theory of Social Self-organization." *European Journal of Social Theory*, 6(4), 387-408.

Fuchs, C. (2003b) "Structuration Theory and Self-Organization." *Systemic Practice and Action Research*, 16(4), 133-167.

Fuchs, C. (2003c). "The Self-organization of Matter." *Nature, Society, and Thought*, 16(3), 281-313.

Fuchs, C. & Hofkirchner, W. (2005). "Self-organization, Knowledge, and Responsibility." *Kybernetes*, 34(1-2), 241-260.

Giddens, A. (1991). *Modernity and Self-identity. Self and Society In the Late Modern Age.*

Stanford, CA: Stanford University Press.
Giddens, A. (1984). *The Constitution of Society*. Cambridge: Polity Press.
Giles, J. (2005). "Internet Encyclopaedias Go Head To Head." *Nature* (Qnline), December 14th, 2005.
Gillmor, D. (2006). *We the Media: Grassroots Journalism by the People, for the People*. Beijing: O'Reilly.
Hagel, J. III & Armstrong, A. G. (1997). *Net Gain: Expanding Markets through Virtual Communities*. Boston: Harvard Business School Press.
Hofkirchner, Wo. (2002). "Projekt Eine Welt: Kognition – Kommunikation – Kooperation. Münster. LIT.
Howard, P. N. & Jones, S. (2004). *Society Online*. Thousand Oaks: Sage.
Jones, S. G. (Ed.) (1995a). *Cybersociety: Computer-mediated Communication and Community*. Thousand Oaks: Sage.
Jones, S. G. (1995b). "Understanding Community in the Information Age." In: Jones (1995a). pp. 10-35.
Jones, S. G. (1997a). "The Internet and its Social Landscape." In: Jones (1997b). pp. 7-35.
Jones, S. G. (Ed.) (1997b). *Virtual culture: Identity & Communication in Cybersociety*. London: Sage.
Jones, S. G. (Ed.). (1998). *Cybersociety 2.0: Revisiting Computer-mediated Communication and Community*. Thousand Oaks: Sage.
Jones, S. G. (Ed.). (2003) *Encyclopedia of New Media*. Thousand Oaks: Sage.
Kahn, R. & Kellner, D. (2004). "New Media and Internet Activism: From the "Battle of Seattle" to Blogging." *New Media & Society*, 6(1), 87-95.
Kalz, M. (2005). *Strukturierungstheorie: Ein Rahmenwerk für die Wiki-Forschung?* Proceedings of the Wikimania 2005. Frankfurt. http://meta.wikimedia.org/wiki/Transwiki:Wikimania05/Paper-MK3.
Kendall, L. (2003). Virtual community. In: Jones, Steven (2003). pp. 467-470.
Kline, D. & Burstein, D. (2005). *Blog! How the Newest Media Revolution is Changing Politics, Business and Culture*. New York: CDS Books.
Kolbitsch, J. & Maurer, H. (2005). *Community Building Around Encyclopaedic Knowledge*. http://www.iicm.edu/iicm_papers/community_building_around_encyclopaedic_knowledge.pdf.
Kollock, P. & Smith, M. (1999). "Communities in Cyberspace." In Kollock, P. & Smith, M. (Eds.), (pp. 3-25), *Communities in Cyberspace*. London: Routledge.
Kuhns, P. & Crew, A. (2006). *Blogosphere: Best of Blogs*. Indianapolis. Que.
Lazar, J. & Preece, J. (1998). "Classification Scheme for Online Communities." *Proceedings of the Fourth Americas Conference on Information Systems*, 84-86.
Lazar, J., Hanst, E., Buchwalter, J. & Preece, J. (2001). "Collecting User Requirements in a Virtual Population: A Case Study." *WebNet Journal*, 2(4), 20-27.
Lévy, P. (1997). *Collective Intelligence*. New York: Plenum.
Levy, St. (2006), August 18. Living in the Blog-osphere. *Newsweek*
Lih, A. (2004). *Wikipedia as Participatory Journalism: Reliable Sources?* Paper presented at the 5th International Symposium on Online Journalism, April 16 - 17, 2004, Austin, Texas, USA. Online: http://staff.washington.edu/clifford/teaching/readingfiles/utaustin-2004-wikipedia-rc2.pdf.
Ma, C. (2005). *What Makes Wikipedia so Special? The Social, Cultural, Economical Implications of the Wikipedia*. Online: http://cathyma.net/wikipedia/cathyma_wikipedia.pdf.
Marcuse, H. (1969). "Repressive Tolerance." In R. P. Wolff, B. Moore Jr., & H. Marcuse (Eds.), *A Critique of pure tolerance* (pp. 95-137). Boston: Beacon Press.
McKiernan, G. (2005). WikimediaWorlds part I: Wikipedia. *Library Hi Tech News*, 22(8).
McLaughlin, M. L., Osborne, K. K., & Smith, C. B. (1995). "Standards of Conduct on Usenet." In: Jones (1995). pp. 90-111.
O'Reilly, T. (2005) "What Is Web 2.0?" http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html?page=1.
Poster, M. (2001). *What's the Matter with the Internet?* Minneapolis, MN: University of Minnesota Press.
Rheingold, H. (2000). *The Virtual Community: Homesteading on the electronic frontier*. Cambridge, MA: MIT Press.
Saveri, A., Rheingold, H. & Vian, K. (2005). *Technologies of Cooperation*. Palo Alto, CA: Institute for the Future.
Schuler, D. (1995). *Creating Public Space in Cyberspace: The rise of new community net-*