RESEARCH SYNOPSIS

UNDERSTANDING CONSUMERS' COLLECTIVE ACTION ON THE INTERNET:

A CONCEPTUALIZATION AND EMPIRICAL INVESTIGATION OF THE FREE- AND OPEN-SOURCE MOVEMENT

SUBMITTED FOR CUMULATIVE HABILITATION

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ABSTRACT

This research synopsis offers a comprehensive overview of four main research areas which have been investigated for the purpose of understanding *why* online consumer communities engage in collective innovation and *how* they organize this action in a sustainable manner. The free and open-source (F/OSS) movement provides a rich and extensive domain for researching this contemporary phenomenon. An integrative view of collective action theory was chosen as theoretical frame for studying the individual, structural, and social context of online consumer innovation. The first area of investigation looks at the motivation and self-realization needs of individuals, which drive them to engage in contributing to the collective effort. The second part investigates in depth, social exchange, knowledge sharing, and knowledge creation processes for resource mobilization. The summary of research is completed with descriptions of the formation and manifestation of the culture of the F/OSS movement. Finally, the body of research is discussed and implications for future research are outlined.

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1 INTRODUCTION

This habilitation thesis presents a comprehensive theoretical and empirical study into a fairly recent phenomenon in consumer behavior – collective action in online consumer communities. Consumer research into the changes and new patterns of consumer behavior prompted by the virtual environment of the Internet has received much research attention in the last decade (Hoffman and Novak, 1996; Alba et al., 1997; Peterson et al., 1997; Kozinets, 1999; Muniz and O'Guinn, 2001; Schau, 2003; Muniz and Schau, 2005). The fact that the Internet allows consumers to play a more active role has further contributed to a more differentiated view of consumers, highlighting their role as emancipated actors in value-creation processes (Dellaert, 2000; Kozinets, 2002a). Virtual groups of consumers gather around favorite products and brands, provide support to other consumers, and engage in active social discourse on various online platforms (Figallo, 1998; Kozinets, 1999; Muniz and O'Guinn, 2001). Consumers are provided with new and unprecedented possibilities, which help them to depart from their role as passive consumers to engage in more active forms of exchange with other consumers, as well as with organizations and companies.

This research revolves around groups of enthusiastic and highly committed consumers, who actively engage in collective innovation and production. The Internet has facilitated emancipated online communities, which serve as forums for peer-to-peer exchange and collective online innovation. Previous research on emancipative consumption and consumer resistance suggests that those communities have a political component as well. Based on a strong ideological belief in freedom and democracy, a characteristic of online communities from the very beginning of the first WELL communities (Berners-Lee, 2000), resistive consumer communities strive for

decommodification of digital goods from the market to the communal sphere (Wallendorf and Arnould, 1991; Firat and Venkatesh, 1995; Kozinets, 2002a). The 'Napster Experience' (Giesler, forthcoming 2006) is one of the most well-known examples of (seemingly anarchic) online peer-to-peer exchange.

The 'open-source community' provides another, yet more extreme example of how enthusiastic consumers can successfully escape the market and even change the way business is done in the software industry (Raymond, 1999; Wayner, 2000; Weber, 2004). Whereas emancipative consumer behavior and resistance explain how consumers can succeed in escaping the contemporary capitalist market forces, active engagement in innovation and production by and for consumers reflects a radical shift in power from the market to the consumer. Until recently, online consumer innovation was a largely unexplored field of research. Research has been conducted that examines why individual consumers become involved in online innovation and joint-production of open-source software, as well as in material products such as mountain bikes and basketball shoes (Kuwabara, 1998; Hemetsberger and Pieters, 2001; Hemetsberger, 2001a; Lerner and Tirole, 2002; Hertel et al., 2003; Lakhani and Wolf, 2003; Füller, 2006). Furthermore, researchers have investigated how members of the open-source community use the networking effect in a technological as well as social sense for knowledge sharing (Tuomi, 2001; Lee and Cole, 2003; Morner and Lanzara, 2004; Lanzara and Morner, 2005). Other research has been concerned with integration processes of aspirant members, cooperation and coordination of contributors, gift giving, and cooperation between companies and the open-source community (Lakhani and von Hippel, 2000; Bergquist and Ljundberg, 2001; von Krogh et al., 2003; Zeitlyn, 2003; Dahlander and Magnusson, 2005). Apart from these topics, current research leaves us uninformed about *why* and *how* these online consumer

groups contribute to, cooperate, and coordinate their actions towards the achievement of a common goal. A first theoretical conceptualization of the free and open-source (F/OSS) movement has been recently provided by von Hippel and von Krogh (2003). Why the members of the open-source community engage in collective action, and how they manage to be successful in this respect, however, has been largely unexplored. What is missing in the literature is an integrated conceptualization and empirical investigation of the free and open-source phenomenon as a social movement, whereby consumers actively resist the market through innovation and joint-production.

This body of research seeks to close these gaps and to further contribute to a deepened understanding of online collective consumer action, as exemplified by the F/OSS community. An integrated, resources and culture-based perspective of new social movements is applied. The body of research comprises findings about the motivational, cultural, and resources-related underpinnings of the open-source movement. For the purpose of this research synopsis, a description of the research domain - the open-source community - is provided first. Then, theories of collective action will briefly be described and juxtaposed followed by a discussion of the most appropriate theoretical perspective. The next section will then elaborate on the ontology of the Internet and discuss its contribution to the formation and constitution of online consumer movements. Subsequently, the research agenda and methodology will be outlined. The main part of this research synopsis will discuss the body of work that has been advanced by the habilitation research and outline the way in which this research contributes to the current literature. The last section provides a summary of these contributions and describes how this body of work will be extended in the future.

2 RESEARCH DOMAIN – THE FREE AND OPEN-SOURCE COMMUNITY

"open source is the koolest thing to happen since toilets
i wanted to get involved because it is so amazing how extremely complex applications are being created by a group of individuals thousands of miles away from each other – and they are QUALITY applications!"
(anonymous contributor to the open-source community)

The free and open-source (F/OSS) community has been one of the most intriguing and insightful examples of online joint-production and collective action, firstly because of their immense productivity and secondly, because of the global success of their products – open-source software. Thousands of expert programmers and millions of users worldwide work voluntarily on the development and improvement of new and existing high-quality open-source software. The distinctive element of this effort as compared to the provision of other free digital goods, is that the core of software innovation, the source code, is included. The operating system Linux is one of the most prominent examples, which is said to be the most common server platform in the world today, with millions of users. The Linux kernel has been programmed from scratch by Linus Torvalds, at that time a Finnish student, who published the source code on the Internet in 1991. This code has attracted hundreds and thousands of professional and hobby programmers to contribute code and improve on the new kernel of the Unix-like operating system for PC's. Like all other free and open-source software, Linux is free for everybody to download and – if experienced enough – to contribute to the source code. In exchange for being able to use and modify the software, the users of software also have to make their contributions freely available and not impose any licensing restrictions to others. A variety of licensing schemes have been developed among which the GPL (General Public License) is the most widely used. Hence,

one of the distinctive elements of the F/OSS movement is that project contributors systematically and freely reveal source code they have developed at their private expense to the public (Raymond, 1999). Accordingly, the movement is characterized by a strong culture of free-sharing and openness, however its intensity varies with different projects and people.

Linux was by no means the first open-source initiative. The seeds of the F/OSS movement were sown long before. Developing software and giving away the source code was common practice in the early sixties and seventies when software had simply been a complement for hardware. At that time, a group of MIT's most passionate programmers had developed a common ideology of free sharing. They started calling themselves hackers. Hackers are people who program enthusiastically and who believe that information-sharing is a powerful, positive good, and that it is the ethical duty of hackers to share their expertise by writing free software. (Himanen, 2001). Early protagonists of the "software wants to be free" ideology started resisting as soon as the first commercialized software products for PCs had been licensed and distributed by the Microsoft Corporation. For this reason, the Free Software Foundation (FSF) was established in 1985, dedicated to promoting computer users' rights to use, study, copy, modify, and redistribute computer programs. It took almost 30 years for the free and open-source movement to grow. The F/OSS movement consists of computer-literate software consumers from all over the world, who share similar grievances and goals. Apart from the strong resistive spirit of the free and open-source protagonists, fun and entertainment through programming was, and still is, the most widely shared motive for programmers to code and contribute (Himanen, 2001; Torvalds and Diamond, 2001; Hemetsberger and Pieters, 2001).

Although the commercial distribution of free/open-source software started in 1994, it took some time for the wider, global public, including the press, governments and the computer industry to react. In 1998, the open-source initiative was founded in order to provide an organizational platform for cooperation between the developer community, organizations, and companies. Open-source software was such a great success that it found support from leading corporations from a cross-section of the computer industry. Netscape was the first to release their code with the help of the OS initiative, resulting in the Mozilla browser development. Also Sun Microsystems, Adobe, IBM, to name some of the most prominent corporations, have released their source code, ported their products to Linux, and actively sponsored and worked together with open-source developers. Apart from well-known projects, such as the GNU/Linux operating system, the Apache Web-server, StarOffice, the Mozilla and Firefox Web-browsers, the Pearl programming language, the PhP scripting language, and The Gnome and KDE desktops, ten thousands of smaller, less-known open-source projects are successfully coordinated on-line, and continue to spread the message of the free and open-source software ideology.

3 THE F/OSS MOVEMENT AS A COMMUNITY AND ONLINE NETWORK

Developers and users of free and open-source software are often referred to as 'the free software' or 'the open-source' community' (F/OSS-community). Generically, a community may be understood as "…a set of on-going social relations bound together by a common interest or shared circumstance and, in their intentional form, are capable of acting collectively towards a particular end" (Smith, 1992, p.16). There is an interwoven web of relationships and an ongoing exchange of commonly valued things between

members who feel part of a larger social whole; and the relationships between members last through time, creating shared history (Figallo, 1998).

Aggregations of individuals who share a common interest and meet in the virtual space have been given the notion of virtual or online communities (Rheingold, 2000). As Rheingold defined it, virtual communities are "social aggregations that emerge when enough people carry on…public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace." (Rheingold, 1993, p.5). Members communicate on specific virtual platforms where intense interaction and discourse takes place on an everyday basis. Thus, they build a group of people who share social interaction, and a common 'space' (Kozinets, 1999).

While there are many definitions of community, Muniz and O'Guinn's 2001 sociological review revealed three common markers of community. One marker – 'consciousness of kind' – reflects an intrinsic connection that the community members feel toward one another. Another indicator of community is the existence of shared rituals and practices, which serve to perpetuate the community's history and tradition. The third marker of a community is a sense of moral responsibility, a felt sense of duty and obligation to the community as a whole. Several authors, who researched the F/OSS community, have attested them a community character according to those markers (see for instance: Raymond, 1999; Wayner, 2000; Himanen, 2001). Members feel very close to the group; they feel responsible for other members and for the group outcomes; and they share common rituals and traditions, as for instance officially granting write access to the source code repository after several rounds of high quality contributions (Hemetsberger and Reinhardt, 2006, forthcoming).

However, the F/OSS community is not a single, huge community, but is better thought of as a virtual conglomerate of ‘project communities’ (e.g.: the Linux-community, the Apache-community), which are bound together by similar interests and goals but committed to specific projects (Raymond, 1999). Many F/OSS community members contribute to several projects simultaneously and thus are members of several ‘project communities’. Depending on the size of the project, project communities either consist of a group of developers, or they constitute a bigger community consisting of a number of contributors gathering around a core development team. Apart from these core teams that provide the center of the innovative effort, a huge number of affiliates gather around those groups. The degree of social interaction and contribution varies. They may be active users or passive ‘consumers’ of free and open-source software. Gacek and Arief (2004) characterized the different membership categories in an open-source project as comprising active and passive users, developers, and core developers. Ye et al. (2004) defined the roles of F/OSS community members depending on their contribution and distinguish eight different layers from stakeholders and passive users, to active developers and core members/project leaders.

Although the F/OSS network has developed several different project micro-cultures, they are still connected by a deep-rooted conviction that closed source code is a way of preventing people from self-determined work and use of computers. The values of the community promote passion and freely chosen work. F/OSS protagonists share the belief that individuals can do great things by joining forces in imaginative ways (Himanen, 2001). These values have proliferated throughout the Internet by the work of these enthusiastic programmers, called hackers, and established a countercultural movement of ‘user-based software innovation’ freed from the stranglehold of the market and the

straitjacket of monopolies. Behind the overt motives of hackers, such as the joy of coding and the deep satisfaction by gaining peer reputation for high quality contributions, ideological and political motifs and revolutionary aspirations are hidden. It is the multifaceted character of the F/OSS movement, which has stimulated this body of research. Collective action theory provides the theoretical underpinnings for the investigation of the movement's sustainability and overt success.

4 THEORETICAL FOUNDATION – COLLECTIVE ACTION THEORY

Collective action can be defined as all activity involving two or more individuals contributing to a collective effort on the basis of mutual interests and the possibility of benefits from coordinated action (Marwell and Oliver, 1993). Melucci (1996) defined collective action "…as a set of social practices (i) involving simultaneously a number of individuals and groups, (ii) exhibiting similar morphological characteristics in contiguity of time and space, (iii) implying a social field of relationships and (iv) the capacity of the people involved of making sense of what they are doing." (Melucci, 1996, p.20). Melucci's definition emphasizes the conceptualization of collective action as set of social practices. Hence, collective action is exhibited through everyday common practice, by acts of resistance and group behavior. Furthermore, the above definition suggests three important areas of research into collective action. First, it emphasizes the similarity of social practices not only across geographical borders, but also across time. Both are important signifiers of sustainability of a collective effort. Second, it highlights the relevance of the social relationships involved and thirdly, it asks for an inquiry of how people make sense of what they are doing together. Collective action theory has brought forward a number of

conceptualizations of contemporary social movements, which will be outlined in the following sections.

4.1 THEORIES OF COLLECTIVE ACTION

The literature on social movements in contemporary societies is dominated by two distinct theoretical paradigms: the North American tradition of Resource Mobilization Theory and the European New Social Movement approach (Canel, 1992). In the 1970s and early 1980s Resource Mobilization Theory (MacCarthy and Zald, 1979; Kerbo, 1982; Ferree, 1992) proved to be the most influential approach to explain more or less successful social movements. The Resource Mobilization Theory (RMT) approach to social movements tries to explain their emergence, success, or failure in terms of access to resources. Briefly summarized, RMT argues that the key obstacle to be overcome in order be able to act collectively is the lack of financial and personnel resources. RMT has pointed out that grievances and inequalities could only be considered a precondition for the occurrence of social movements. The passage from condition to action is contingent upon the availability of resources and changes in the opportunities for collective action. Collective action requires the aggregation of resources, and that in turn requires organization. RMT provides a valuable framework for analyzing the necessary structural conditions for collective action. It focuses on how the actors develop strategies and interact with the environment in order to pursue their interests. The ‘political-interactive’ model and the ‘organizational-entrepreneurial’ model are its main approaches to explain the success and failure of social movements. The first model explains political power, interests, and resources, while the latter focuses on organizational dynamics, leadership and resource management. Resource Mobilization theorists argue that prosperous societies

tend to foster social movements, because they generate a number of resources that can aid mobilization. Resources can be of material or non-material nature and include financial resources, manpower, means of communication, as well as loyalty, authority, moral commitment, and solidarity. According to Resource Mobilization Theory, organization of resources, leadership, social networks and strong horizontal links are decisive elements for the mobilization of resources. Strong leaders know how to deal with political forces, create images and symbols, and handle communication media. The organizational structure of social movements, according to RMT, is determined by the nature of the movement and its goals, the type of recruitment process, the role of the leaders in the formative stage, and the influence of third parties who oppose or help the movement.

Resource Mobilization Theory provides a valuable model to explain how people get together, or act together under certain conditions, and how they make use of available resources, recognize them and organize them for the purpose of achieving mobilization of resources (Melucci, 1996). It brought attention to the *how* and thereby, left much room for future theorizing about the importance of *why* people act collectively. In spite of its emphasis on organizational dynamics and necessary networking capacities, Resource Mobilization Theory nevertheless applies an individualistic perspective. Thus, it neglects the existence of collective entities and socially constructed meaning as important social conditions for collective action. Furthermore, it is uninterested in the emotional and affective background for individual decision-making and action. The normative and symbolic contents of social movements and the social process of group identity formation are also neglected. For the same reasons RMT fails to answer the question of how social meaning is constructed in social discourse and how it works as a driving force for action (Canel, 1992; Melucci, 1996; Kelly and Breinlinger, 1996).

In reaction to this critique, alternative approaches have been developed in order to provide a socio-psychological basis that is able to explain the social construction of interests within a collective entity. The basic assumptions underlying these approaches concern the social embeddedness of social actors and the role of interpersonal communication in interpreting enthusiasm and grievances and constructing meaning. Possibly the most prominent field of research in this respect includes identity-oriented approaches like the 'action-identity' paradigm (Touraine, 1985; Offe, 1985) or the 'collective identity' approach (Melucci, 1996). These contributions show interest in questions of how people make sense of their world; in how social practices, and artifacts make their cultural products meaningful to them. New Social Movement Theory also highlights the struggles with the intrusion of the state and corporate hegemony into areas of the 'life-world' (Habermas, 1981). Offe (1985) has argued that new social movements are reactions to retain endangered lifestyles in late capitalist societies (Offe, 1985). Capitalist relations have penetrated into wider spheres of social life, blurring the distinction between the public and the private spheres and giving rise to various conflicts. New social movements expand the political by politicizing civil society and reconstituting it in ways that make it "no longer dependent upon ever more regulation, control, and intervention" (Offe, 1985, p.820). New Social Movement theorists emphasize the new social actors' striving for collective control over the cultural meaning production. They fight for their right to realize their own identity, and advocate the values of equality and participation, autonomy of the individual, democracy, plurality and difference. Theorists argue that new movements are transforming civil society by creating new spaces, new solidarities, and new democratic forms (Cohen, 1985). It is in the context of these 'liberated spaces', where

alternative norms and values guide social interaction, that new identities and solidarities are formed.

It is commonly assumed that the theoretical premises of the two main paradigms are incompatible, but a closer examination indicates otherwise. Each approach examines collective action at a different, but complementary level of analysis. Melucci (1996) has sharply criticized the theoretical gulf between conceptualizations and research on 'objective' conditions and 'subjective' motives and orientations; structural determinants on the one hand and 'values and beliefs', on the other. This way, Melucci (1996) argued, we can never answer the question of how social actors came to form a collectivity and recognize themselves as being part of it; how they maintain themselves over time and how acting together makes sense for the individuals. Melucci's effort to bridge this theoretical gap resulted in an integrated approach of collective action. His synthesis provides the background for this body of research into the open-source phenomenon.

4.2 An Integrative View of Collective Action in the Information Age

The changes that postindustrial societies have undergone in terms of resources and technology have radically altered the sources of social conflict. Contemporary movements in complex societies can no longer be interpreted as a reaction to economic crisis, mere effects of deviance, or problems triggered by exclusion from the political system. We must acknowledge that they are also symptoms of antagonistic conflicts. In societies with high information density, production does not involve economic resources alone; it also concerns social relationships, symbols, identities, and individual needs. In the global society, whether described as complex, postindustrial, postmaterialist, or postmodern,

antagonistic demands arise concerning the way development is conceived and identities and needs are defined. Production is no longer defined as a transformation of natural and human resources into goods by division of labor, and its incorporation into the techno-human complex of a factory. Instead, the global economy has moved to control networks of information and social relationships, today's most valuable resources. The operation and efficiency of economic mechanisms, Melucci contends (1996), depend on the management and control of relational systems where cultural dimensions predominate over 'technical' variables. The market does not simply circulate material goods and services. Rather, it constitutes a system in which information and social symbols are exchanged. Conflicts thus shift towards new goals of constructing social meaning independent of global organizations and market forces, which increasingly control individual behavior in many different spheres. Accordingly, re-appropriation demands are raised by which individuals claim back their right to become themselves. The self in postmodern society, although faced with unprecedented opportunities to define itself, is caught in a complex societal web of opportunities and constraints, yet largely determined by the cultural codes of the market (Baudrillard, 1998).

New social movements challenge established cultural codes and show, by the things they do, and how they do them that an alternative is possible. They largely ignore political systems and challenge the modern separation between the spheres of production and consumption, the public and the private (Firat and Venkatesh, 1995). Antagonistic movements also show a renewed interest in solidarity, a quest for participation and direct action in order to regain control over individuals' private life spheres. Many movements are also characterized by their Utopianism, which is directly or indirectly religious in nature. As such, it gives back spirituality in life that was lost through modernity and

materialism. Concerning the role of the individual, Melucci (1996) states that collective demands increasingly refer to the individual and their needs and experiences. The construction of personal identity is partly imposed by external powers that clash with the individual need for self-realization. These needs however, are depicted as individual concerns in society, which raises conflicts. These conflicts have become collective problems precisely because they involve, on the one hand, the manipulation of identity by power structures, and on the other hand the cultural representation of self-realization needs as an individual concern. In an effort to maintain or create a meaningful life experience, individuals search for help and solidarity in movements that share similar goals.

Several different themes of self-realization have emerged, which nowadays are fueling collective action. Amongst them are issues of youth and adolescence, questions of gender and ethnicity, nature and responsibility, ethics, information, power and domination. A few of these issues are particularly startling facing late capitalist economies of material abundance and affluence, consumerism, and (seemingly) materialistic individuals. One of the surprising developments is the rise of altruistic action and voluntary work for others. A voluntary actor joins a form of collective solidarity of his or her free will, and belongs to a network of relations by virtue of personal choice. An important feature of altruistic action is its gratuitous nature, implying social rather than economic rewards. Gaining important abilities and expertise might be another reason for the engagement in this form of social exchange. The question of why individuals collectively engage in voluntary solidarity and free provision of help and other goods, is an interesting one facing individualistic societies, and calls for further attention.

A second characteristic of contemporary collective action refers to the spiritual quest. In their extreme form they manifest themselves as religious revivals. Yet, many social

movements are at least inspired by a religious ethos or pursue religious rituals and traditions. The religious disenchantment of the contemporary Western world has made individual aspirations to transcend reality difficult. Instrumental rationality has made society become an apparatus identical with its own actions and intolerant of diversity. The sacred thus reemerges as an appeal to experience the world as more than it actually is, as a realm with more than one single ontological reality. The Internet has offered such collective spiritual realms, despite its overt technical characteristic. Particularly spiritual forms of collective action tend to accentuate the cultural character of mobilization. They bring to the surface the ethical concerns of our time, the problems of identity, solidarity and responsibility.

Information as a cognitive and symbolic resource has become an important source of power and thus also a resource for emancipation and resistance. Power structures nowadays are determined by access to information and knowledge as resources for action. The contemporary shift towards symbolic and informational resources also demands a different definition of power and inequality. Inequality cannot be measured only in terms of economic resources; those who organize and distribute information and direct the flow of information can exert power and control in the sense that they are controlling and distributing symbolic and cultural codes that determine our roles and positions in society. Media and the global media industry are the new manufacturers of cultural ‘master codes’ throughout the world. Their main source of power lies in their capacity to infiltrate people’s minds. Hence, from a resource perspective, antagonistic movements can only become successful if they gain access to these resources; if they themselves manage to occupy a social space which is freed from constraints and devoid of master codes sent by mass media. Liberated from master code infiltrations, social movements develop their own

identity, their own cultural codes, and information resources for collective action. In mass society, ideology tends to be the principal source for manipulation. Escaping from ideology through the production of knowledge in the form of awareness, communicative skills, and self-reflexivity, therefore becomes a key resource for mobilization.

Other ‘resources’ for mobilization are necessary, too. Prior to any growing network of resistance is a network of affiliates who share common interests and/or grievances. Participation does not take place by isolated individuals. Such networks form the basis for collective action, and for a minimum of calculation and prediction of the effects of action. However, collective action also necessitates the identification of an adversary in order to become a resisting force. Depicting the adversary is as important as a minimum level of solidarity within the group, because both processes provide energy for action. Mobilization is always a process of transfer of preexisting resources to the benefit of new objectives. During that process, a transformation takes place, the ‘genetic code’ of a new social unit develops. The genetic code is negotiated and constructed in social discourse and, in the case of a movement, ideologically colored.

Despite the importance of cultural codes, which form the ideological background for action, a movement can only survive if spontaneous action transforms into an organized effort. Organization, coordination and retention of resources are the backbones of a movement’s sustainability. Goal-oriented collective action is not possible under pure anarchy, but demands the development of social structures, group norms, rules and at least informal leadership based on a common understanding of the group's objectives. Based on the structural conditions given, specific networks of individuals and groups can form and mobilize resources. Melucci (1996) is very clear in his contentions about the most important resources in contemporary Western economies: information and knowledge.

Hence, access to these resources is decisive for collective action to prove successful. Yet, organizational theorists agree that knowledge resources cannot be simplified as commodities. Knowledge should rather be defined in terms of intellectual resources comprising human capital, structural capital, and relational capital (Bontis, 2002). According to this view, knowledge of members, organizational routines and artifacts, as well as relations to various social actors are the ingredients of knowledge resource mobilization.

To summarize, current collective action theorists increasingly emphasize the necessity to integrate the two most prominent theoretical approaches in the literature (Melucci, 1996; Canel, 1992) into an extended view that incorporates the cultural underpinnings as well as the resource mobilization processes in contemporary social movements. Furthermore, solidarity is based on an individual striving for the definition of self, which however has to transform into collective action in order to potentially change power relations and inequalities. Moreover, collective action requires a common space, which is freed from power constraints and enables groups to coordinate and organize their actions. The Internet provides such a space.

The ways in which people organize collective action vary greatly according to the environment in which the group operates (Marwell and Oliver, 1993). Also the way in which social movements create meaning, share their grievances, and collectively act together is determined by the characteristics of this common space. Online communities share a radically different environment and common reality, much of which is collectively constructed and defined in an ontological sense. In the following, a categorization of possible ontological views of the Internet is introduced, and its implications for research are discussed.

5 ONTOLOGIES OF THE INTERNET

> "The Net offers us a chance to take charge of our own lives and to redefine our role as citizens of local communities and of a global society. It also hands us the responsibility to govern ourselves, to think for ourselves, to educate our children, to do business honestly, and to work with fellow citizens to design rules we want to live by." (Esther Dyson, 1997, p.2)

Any Internet-related research starts from implicit or explicit assumptions about the ontological reality of the Internet. At one level, the computer is a tool and the Internet an interlinked transportation system consisting of glass-fiber wires, computers, backbones, gateways, and servers. In the postmodern consumer research era we are vulnerable to romanticize cyberspace and think of it as a wonderful fantasy world of multi-user dungeons (MUDs), games and communities, which, of course, is no less true than its physical interpretation. However, from a realist position it is equally valid to think of the Internet in terms of bandwidth, bits and bytes.

	Ontology	
Level of Analysis	***Realist/Modern***	***Relativist/Postmodern***
Individual realm	Physical/Transactional space	Transcendental space
Peer-to-peer realm	Interactional space	Communal/Cultural space
Public realm	Networked/hyperlinked space	Idealist/Political space

Table 1. The ontology of cyberspace – a framework for consumer research in cyberspace

5.1 THE INTERNET AS A NEW, REALIST ENVIRONMENT FOR COLLECTIVE ACTION

The Net can be thought of as a physical realm of tangible tools, wires, electricity, and magnetism where data are exchanged. Individuals alter the virtual reality in a physical sense; they add and store data, exchange information and maintain archives. The format has changed, but *not* the content. Yet, this modernist view of the Internet as a mere system of data transportation, of course, is vulnerable to accusations of reductionism.

First and foremost, the Internet is a network of digital information rather than physical objects. Information is produced by an interwoven network of actors and usually free and accessible to a global public. This particular quality of the Internet has been said to considerably liberate and empower consumers (Dickson, 2000; Kozinets, 1999). Whereas in the 'non-virtual world' consumers mainly create value for themselves, their family and peers, they now own the means to produce, provide and share their digital goods with a global public. The distribution of digital products via Internet requires relatively little effort in terms of time and money (Kollock and Smith, 1998) which lowers the threshold for voluntary contributions.

Moreover, the Internet's democratic potential dissolves the isolation of individuals from societal and economic processes and enables participation in knowledge development and production. This egalitarian quality of the Internet, in turn, enables anyone capable and willing to participate in online collective action to do so. Furthermore, the huge and globally available knowledge base developed online provides the necessary resources for the collective action of online communities. Particularly when know-how is of prime importance for value-creation, online communities' creative potential becomes powerful. Additionally, the Internet ideology of sharing (Berners-Lee, 2000) helps bundle those

resources for the achievement of a common goal and resistance against existing market structures and commodification of products. The few legal restrictions imposed on Internet access and usage has been a fertile ground for the evolvement of democratic and liberal cultures which set up their own rules of conduct. Offline power structures and social status dissolve and are rebuilt based on online group norms and culture. Hoarding of information as a source of power is impossible on the Net firstly, because the 'silent person' on the Internet is invisible and unrecognized (Wayner, 2000) and secondly, because there is always someone online, who is willing to provide the information needed. Thus, in online communities 'power' and social status mainly derive from what people give away rather than what they possess (Raymond, 1999).

Collective action also requires coordination of activities. One of the most important prerequisites for coordination and cooperation on the Internet is provided by the functionality of various communication and groupware tools. They provide a meeting place for online interaction without regard to time or physical location. It is the Internet's extraordinary capability to transmit information, knowledge and digital products, which facilitates the coordination of activities. The functionalities provided range from archives and storage of digital data to asynchronous or synchronous bi and multi-directional communication (Hoffman and Novak, 1996). These communicative qualities of the Internet represent one of the most important preconditions for collaboration and enable mass participation in collective activities (Melucci, 1996). The Internet enables a much larger, global community to gather together much more quickly and easily than real-life groups (O'Reilly, 1999). Even concerns of marginal importance to the majority of humankind find a sufficient number of interested people on the Net. Moreover, group activity and interaction on a global basis are neither bound to specific time structures, nor

to geographical boundaries. The networking ability of the Internet to bring people together who share the same interests, passions, and grievances is an important structural asset, which can help online movements to grow.

5.2 THE INTERNET AS A POSTMODERN, TRANSCENDENT REALM

The possibility to construct or reconstruct one's identity constitutes one major motivational source for individuals to present themselves to the online public (Schau and Gilly, 2003). Whereas in a face-to-face interaction, attraction is highly determined by the features of one's physical appearance and the social categories, roles and stereotypes they are associated with (McKenna and Bargh, 1998), individuals in a virtual world are able to carve out the identities they wish to express. This gives room to the development of roles and social status that are fundamentally different from non-virtual ones. Social relationships are based on what individuals deliberately disclose online, and how relevant others interpret those cues to be. Thus, anonymity enables participants to share a completely different 'virtual' life sphere with similar others, which they might probably never find in a geographically limited place.

In her book 'life on the screen' Turkle (1995) tells us the story of the changing impact of the computer on our psychological lives. When we immerse in the virtual world of a MUD, a new sense of identity is emerging, she argues, one which is de-centered, multiple and fluid (Turkle, 1995). Cyberspaces are also imaginary and constructed; products of science fiction (Venkatesh, Meamber and Firat, 1997). They are full of paradoxes and techno-fantasies, both real and unreal as individuals dive into or withdraw from the fiction. What characterizes these cyberspaces is the physical location of the subject independent of the body, embedded in a system of symbolic forms and information

nodes, while sitting at home and gazing at the screen (Turkle, 1995). Davis (1998) and Wertheim (1999) put these posthuman fantasies of cyberspaces even further into a futurist discussion of the transhuman, transcendental, sacred, and immortal facet of the virtual self. Margaret Wertheim's (1999) philosophical and historical-spiritual analysis of cyberspace, or Eric Davis' (1998) 'magical mystery tour' through the techno-mind and the spiritual life of the ‘cyborg’ focus on the potential of digital environments to free cyber participants from their corporeal selves and the confines of their material worlds. This techno-transcendental and spiritual ontology of 'cyberspace' has major implications for the construction of the digital self, as well as for social and political interaction on the Net. The Internet was originally conceived and carefully crafted as a free, liberal, and democratic space committed to community values. The first Net anthropologists (Rheingold, 1993) soon began to worship the communal character of the Internet, its community life, and its impact on personality and identity construction (McKenna and Bargh, 1998). The new/old communal reality brought forward enthusiasm for the new forms of communal life, and fears of collective loneliness at the same time. Consumer research today provides a rich basis of ethnographic insights into online brands, entertainment, and emancipatory consumption cultures (Tambyah, 1996; Kollock and Smith, 1998; Muniz and O'Guinn, 2001; Kozinets, 2002a; Giesler and Pohlmann, 2003b) to start from. The communal spaces described are, of course, symbolic in nature; full of substance and meaning yet, less physical (Fernback, 1999).

Cyber communities have their own cultural composition. It is the communal space where consumer emancipation takes place and provides a rationale to argue against Baudrillard’s view of the political apathy of the masses (Baudrillard, 1993). The Internet also constitutes an idealist and political space, a fertile ground for consumer resistance

(Penaloza and Price, 1993; Kozinets and Handelman, 2004; Muniz and Hamer, 2001) and protest systems to evolve (Davis, 1998; Giesler, 2006, forthcoming). Ideologies mobilize consumer activists (Kozinets and Handelman, 2004; Melucci, 1996) and the Internet provides a fertile ground for the propagation of libertarian values (Wayner, 2000). This 'ideoscape' (Venkatesh, Meamber, and Firat, 1997) provides the room-to-move for antagonistic consumer movements. The Internet's more realist characteristics provide knowledge about access to resources and structural artifacts. Hence, if we as researchers want to gain an integrated understanding of online phenomena, such as new online consumer movements, taking a multifaceted view appears sensible.

6 RESEARCH AGENDA

The methodological approach to collective action, herein, departs from the assumption of man as a 'responder' to exertions of power, and an 'adaptor' to social constraints. This research rather views consumers as active creators of their own identity and that of a collective entity of which they are a part and to which they are committed. This said, realist assumptions of the Internet are not neglected throughout this body of research. However, the physical and transactional realities of the Internet are not investigated in their own right, but viewed as a means by which collective actors co-construct and ascribe meaning to what they are doing, why they are doing it, and how. Hence, from an epistemological perspective, it is the objective of this research to contribute to a deepened understanding of the individual, communal, and political motivations, mechanisms, and implications of the collective action of creative consumers on the Internet.

From the above portrayal of the multifaceted ontology of the Internet, we can derive important fields of investigation into online collective action of consumers that have not been addressed before in the literature. From a realist standpoint, the Internet alters the exchange dynamics of resources for mobilization. Hence, I conducted research into the exchange of material, social, and knowledge-related resources, in particular, and how these resources can be organized for collective action. Furthermore, I investigated how the communication and networking abilities of the Internet alter the motivation of contributors and the formation of online groups. Taking a postmodern stance to online collective action adds two further fields of investigation. According to Turkle, an individual's motivation to dive into the virtual world is also shaped by the transcendent characteristics of the Internet. Research into self-realization through participation in collective action has been carried out so as to grasp this postmodern facet of online consumer behavior. Furthermore, the virtual realm has liberated consumers from the stranglehold of the market and led to an increase in empowerment and resistance. Hence, I investigated the way in which cultural codes contribute to and help sustain the culture of resistance of the F/OSS movement. The areas of research are depicted in Table 2.

	Ontology	
Area of Research	***Constructivist/ Constructionist***	***Critical theory/ Postmodern***
"Defining the creative self"	Motivations for participation in collective action	Collective action for self-realization
"The empowered consumer"	Social exchange processes and gift giving	
"Mobilizing knowledge resources"	Learning; Knowledge sharing and creation	
"The formation and manifestation of culture"	The formation of innovative online consumer communities	Resistive consumer behavior and ideology

Table 2. Categorization of the investigated research areas

To summarize, the body of research described in this synopsis comprises four main areas of investigation, which relate to *why* individuals and the social collective engage in collective action, and *how* the actors involved mobilize their resources and organize their actions. The research areas also reflect different levels of analysis, from the individual to the collective. These levels of analysis together with the ontological positioning of the research areas largely determine how the methodological decisions have been made. The following section will briefly discuss the choice of methods.

7 METHODOLOGY

Collective action theory does not dictate any particular method of research, however, the theoretical framework used and its underlying assumptions rule out some and suggest others. Viewing consumer cultures of resistance as co-constructed social entities implies that its cultural codes and patterns of behavior cannot be assessed by aggregating data collected on an individual level. As individuals do not construct knowledge independently from their social context, methods that sample only individual understanding are pointless. Therefore, methods have to be applied, and data sources used, that reflect group level action and reasoning. Researchers, who adhere to the social constructionist assumption, have always been looking for 'non-reactive' methods, for instance archival research, in order to avoid individualistic bias and elicit 'the collective'. Moreover, research into online cultures requires procedures and methods that suit the distinct online environment. Non-participatory 'netnographic' inquiry (Kozinets, 2002b) and 'grounded theory' (Strauss, 1987; Goulding, 2002) have therefore been chosen as appropriate methods of conducting research into the cultural aspects of online consumer communities. Accordingly, several

online sources that refer to the free and open-source community, as well as online discourse of its members, have been sampled and analyzed.

Careful attention should be given to social discourse, not only as a means to transport content, but also as an intentional communicative act (Hardy, 2004). According to Potter and Wetherell (1987) and McKinlay et al. (1993), communicative acts should be treated as social acts in their own right rather than secondary routes to underlying attitudes or beliefs. If we interpret a group discussion as an expression of beliefs, we might miss the actual function of their communicative acts. Communication content is one thing, what people intend and *do* when they communicate, another. By means of discourse, online groups define their common goal, propagate central ideas, challenge norms and roles, create commitment, and build relationships. Hence, discourse analysis is the most appropriate method for the investigation of intentional, communicative acts for the purpose of the sustainability of collective action.

This said, one exception has been made with regard to the methodological stance of this body of research. This exception refers to the arguments of some researchers, who argue for the importance to sample "culture as well as cognition" (Farr, 1933, p.24), that is to investigate the cultural environment as well as individuals' perception of their environment. Perceptions, representations, and values of actors with regard to their own action contribute to our understanding of collective action particularly regarding member acquisition and retention. The motivation of individuals to contribute to and participate in the F/OSS movement has therefore been investigated through the analysis of self-report data and content analysis (Patton, 1990; Kolbe and Burnett, 1991). Additionally, collecting individual reasoning and interpretation of social processes is also useful in cross-checking the accuracy of the cultural interpretations of the phenomenon.

8 BODY OF RESEARCH

8.1 THE CREATIVE CONSUMER

8.1.1 Motivations for participation in collective action

F/OSS communities have proven to be capable of creating complex innovations and sustaining a creative community without any commercial involvement. As consumers become producers of their own software, they actively and creatively resist proprietary software producers and thus stimulate a rethinking of traditional business models. Furthermore, these consumers also enthusiastically innovate, which provokes the question of why consumers contribute without any material reward. The objective of this first empirical study (Hemetsberger, 2001a; Hemetsberger and Pieters, 2001) is to address the research question of what attracts and motivates volunteers to contribute to a collective effort on the Internet.

Research into motivation is very rich. Several theories have been put forward, which could potentially contribute to an explanation of enthusiastically contributing consumers. Furthermore, specific research has been conducted on the motivation of voluntary workers and later, research into the motivation of open-source programmers (Hemetsberger and Pieters, 2001; Lerner and Tirole, 2002; Hertel et al., 2003; Lakhani and Wolf, 2003). A review of the most important contributions in this regard leads to a categorization of motivations comprising two basic sources of motivation: self-concern and other-concern. Self-concern includes task and product-related motivations, utilitarian goals, and social significance motives, which are both intrinsic and extrinsic in nature. Other-concern motives encompass internalized group goals and values, and socio-emotional bonds with the group and the community.

Individuals are motivated intrinsically and perform programming tasks just because it is ‘fun’; a joyful experience or passion that drives individuals to repetitive pursuance of these activities in order to maintain this state of ‘jouissance’ (Belk et al., 2000). When individuals are completely involved with an activity and totally immersed in it, they experience a state of ‘flow’, which Csikszentmihalyi (1990) characterized as ‘optimal experience’. Deci (1975) further argued that the main factors of motivation are an individual’s need to regard him or herself as competent. Kollock and Smith (1998) and Kuwabara (2000) similarly argue that a sense of self-efficacy (Bandura, 1995) may play a major role in motivating people to make regular and high-quality contributions on the Internet. Self-efficacy refers to an individual’s sense that he or she has an effect on the environment that directly derives from perceived competency and control accompanied by a sense of autonomy. Further self-related motivations refer to the direct personal use value of the object they create. Findings of our qualitative study (Hemetsberger and Pieters, 2001) into the motivations of F/OSS programmers show a high percentage of such need-related motives among contributors. However, contributors also pursue long-term goals, particularly those that involve getting something back in the long run, for instance other software, technical help, gaining knowledge, reputation, or developing their careers.

Individuals also engage in collective action because they value the ethos of the community (Muniz and O’Guinn, 2001; Schouten and McAlexander, 1995), and adhere to the common goal. Research on voluntary work has shown that other-regarding motives also involve feelings of moral obligation to the group, altruistic attitudes, and considerations of fairness. Once internalized, group norms determine the course of action of group members. Additionally, contributors are highly motivated by social relationships and emotional bonds they value. Particularly with highly passionate activities,

communities function as strong reference groups for members. These integrative bonds of fellowship and friendship, reinforced by the shared interests, make the community highly attractive and form the basis of group cohesion (Blau, 1964).

Because consumers' social bonds, expertise and potential to contribute differ, the authors (Hemetsberger and Peters, 2001) have distinguished different levels of involvement with regard to the amount and type of contribution and its relation to different motives. Based on a sample size of more than 1300 F/OSS programmers, groups of contributors could be distinguished. In line with the theoretical propositions, the findings showed a significant correlation between the amount and quality of contributions and the relation of self and other-concerned motives. Higher amounts and quality of contributions corresponded with a more other-concerned motivational basis. Furthermore, core contributors are also significantly more intrinsically motivated as opposed to community members, who contribute less. Another important finding relates to knowledge sharing in the community. Gaining knowledge is one of the most frequently mentioned motives to engage in programming and to contribute. Knowledge, which is freely distributed, shared and thus multiplied within the community, provides the most important resource for self-concerned *and* other-concerned contributors. Various authors have since conducted research into the motivations of F/OSS programmers. Yet, except Hemetsberger and Pieters (2001), none has, so far provided a qualitative, comprehensive categorization of motivations, nor did any publication discover the relationship between the intensity of contribution and its underlying motivational structure regarding self/other-concern, intrinsic/extrinsic, and short-term/long-term goals. Table 3 comprehensively shows the self-reported motivational status of the F/OSS community.

motivations		intensity of contribution							
classes	**categories**	**main contributors** (n=88)		**contributors** (n=897)		**users** (n=154)		**Total** (n=1139)	
		count	within group%	count	within group%	count	within group%	count	within group%
task-related**									
	*intrinsic****	*48*	*54.5%*	*357*	*39.8%*	*43*	*27.9%*	*448*	*39.3%*
	extrinsic	*38*	*43.2%*	*441*	*49.2%*	*70*	*45.5%*	*549*	*48.2%*
	total	**64**	**72.2%**	**655**	**73.0%**	**94**	**61.0%**	**813**	**71.4%**
product-related***		**14**	**15.9%**	**85**	**9.5%**	**65**	**42.4%**	**164**	**14.4%**
long-term motivation		**42**	**47.7%**	**324**	**36.1%**	**49**	**31.8%**	**415**	**36.4%**
ethos: values and beliefs		**54**	**61.4%**	**463**	**51.6%**	**25**	**16.2%**	**542**	**47.6%**
socio-emotional		**15**	**17.0%**	**90**	**10.0%**	**18**	**11.7%**	**123**	**10.8%**

*** p< .001 ** p< .01

Table 3. Frequencies of Classes of Motivations of Different Groups of Contributors (Source: Hemetsberger and Pieters, 2001)

8.1.2 Collective action for self-realization

In addition to researching participants' perception of their motivation to contribute to the collective action of the F/OSS movement, further research has been conducted with regard to individual self-realization (Hemetsberger, 2005). Collective action theorists have argued (Melucci, 1996) that individuals strive to define themselves independently from external political powers and market forces. The need for self-realization and meaningful life experiences may drive individuals to seek for help and solidarity in movements that share similar goals. The Internet provides a realm for redefinition and portrayal of self-identity (Schau and Gilly, 2003). Consumers use the virtual space to construct, redefine, and create their digital self for others to view and also for the purpose of self-realization. They do this, for instance, by means of contributing to collective action and taking part in a social movement.

By looking at the Internet as a ‘living space’ we can clarify the question of how this space can help individuals to become creative and to achieve a self-determined self. However, the virtual space is not context-free, nor do individuals 'inhabit' it alone. Hence, the self in the digital realm is genuinely dependent on others mirroring its digital portrayal and performance. Questions that arise with regard to the self-realization of individuals in the virtual realm are: How do consumers construct (realize) their human selves in the virtual realm? How do they make use of online technology? Which parts, representations, or extensions of themselves do they exhibit for self-*real*ization (or –virtualization) to occur that transcends their real world existence? How do other digital selves contribute to that process?

Technological conditions, as well as economic, social, and political forces, shape our approach to the self. Postmodern conditions shape our lives, resulting in what Gergen called the saturated self (Gergen, 1991), and Baudrillard, consumer society (Baudrillard, 1998). Consumer society leaves us with an abundance of material wealth and social signs of our ego, yet it is mirrored in an unsatisfied, alienated self. Faced with these conditions, the true and unique personality, *the* self, is in trouble. On a psychological level, self-realization implies becoming one’s own self, or as Jung put it, a process of individuation (Jung, 1990). Individuation is a process which aims to bring the conscious and unconscious, the individual and collective into unity on a higher level of self. As individuals become increasingly concerned about their spiritual well-being, their moral values, and their emotional capacities, they strive to locate a solid, objective basis for centering themselves and giving direction to the future (Gergen, 1991). The more fragmented our lives become, the more we feel the urge to commit ourselves again to

people, places, objects, and activities that create identity, and contribute to a sense of wholeness.

F/OSS programmers construct and portray themselves in various ways, which point at their uniqueness as individuals and likewise at their role within the community. The findings of this non-participatory, netnographic research (Hemetsberger, 2005) reveal that F/OSS programmers, by contributing to the community, construct different facets of their virtual self. Their portrayals exhibit a thinking self, an emotional self, and a spiritual self with varying degrees of interconnectedness with others. The *thinking self* is virtually represented by source code, by exchanging and contributing to others' source code, and lastly by their contribution to a collectively created innovation in the form of a software program. Because the contributions of a particular F/OSS programmer are always identifiable, code is a highly elegant and subtle way of exhibiting ones intellectual capabilities to the community and to the public. Code, viewed in the purest sense is nothing but the materialization of an individual's thoughts. The power of Internet technology for the self-realization of individuals is that, now that we are interconnected, those materializations become digitalized and thereby made visible to the online public. Exchanging one's creative work with peers frees the self and the others from the constraints of the materialistic world; it liberates the self from hoarding and from work alienation because others can see their work. Moreover, those materialized minds become extended by the materializations of like-minded others. The 'collective brain' promises a transformation of the thinking self into a globally unique and grand innovation. Hence, the collective effort becomes worthwhile.

The *emotional self* is exhibited by passionately engaging in coding, communion, and revolting. Coding is considered a 'labor of love'. For programmers, passion describes the

general tenor of their activity, though its fulfillment may not be sheer joyful play in all its aspects (Himanen, 2001). Coding appears to be a fascinating and exciting challenge, something that can be immediately verified, after they have carefully crafted the piece. The desire for sociality (Belk, Ger and Askegaard, 2003) and the need to compare our self with relevant others drives our constant search for relationships and determines the communal self. The Net is a place where individuals can collectively create imaginative other worlds and try out other roles and personalities. Individuals split their self into various real, imaginary, and humorous selves in an attempt to elaborate and construct their communal self. Freed from the corporeal self, individuals use various symbols, hacker language, humor, and word art for self-construction.

F/OSS selves also revolt; not against the Western economic system per se but against its extreme manifestations as power-exerting entities which cut off individuals from a self-determined life. Hence, individuals homestead the Internet as an open space or room-to-move – establish a contradiction to the impenetrability of economic institutions and corporations, of the corporate world, and of narrow-mindedness. Activism is their way to escape and surpass the limitations of modernist Western thought. As such, it has significant political *and* economic impact. Similar to the Napster community, F/OSS contributors oppose commodification, corporations and copyright (Giesler and Pohlmann, 2003b), however, in a highly reflective way. Through contributions to social discourse in the F/OSS community, the revolting self is made visible.

The *spiritual self* unveils the transcendent and immortal aspects of self-construction in the virtual realm. Cyberspace is constructed as a sacred place for contemplation and self-construction, and the space where our digitalized minds, freed from the corporeal mortality, become eternal. Spirituality is not an individual exercise. Individuals also

engage spiritual rituals in order to achieve togetherness, something that becomes more than the sum of the parts, 'to be one of' and merge into the grand creation of the community. People want to be linked with others. Hence, cyberspace is full of 'links' that link community members to other selves who become a constituent part of their own self. The findings of this research (Hemetsberger, 2005) give reason to assume that consumers do create and innovate together with like-minded others in order to achieve a sense of being.

8.2 Social Exchanges and The Empowered Consumer

From a resource mobilization perspective, collective action necessitates organization and exchange. However, exchanges in movements should not be viewed in a purely economic sense, but rather reflect struggles for information and symbolic power. The F/OSS community has established an online network of exchange for the purpose of acquiring and retaining necessary resources for action (Hemetsberger, 2004). In an article on the exchange dynamics of the F/OSS community (Hemetsberger, 2002), emphasis is put on social processes of exchange that maintain mutually beneficial relationships among the members of the F/OSS community. Social exchange is not primarily based on the expectation of immediate and clearly specified rewards, but rather on a general desire for social approval. Individuals tend to reciprocate as they are grateful and feel obligated. One way that groups regulate reciprocation is through the establishment of social norms. Descriptive norms specify what most people do in a particular situation whereas injunctive norms indicate what ought to be or should be done (Cialdini et al., 1990; 1991). Other authors have criticized the paradigmatic assumption of reciprocity in exchange models and rather emphasized an alternative explanation: gift giving (Belk and Coon, 1993; Hemetsberger, 2002; Giesler, 2006, forthcoming). Gifts are primarily given without

expecting anything in return, except a rewarding feeling of doing something good for others. Anderson et al., (1999) further argue that we engage into interaction with others in an effort to control the physical, social, intellectual, and spiritual conditions of our life. Hence, we engage in collective action in order to emancipate ourselves from the stranglehold of consumer society (Baudrillard, 1998). Exchange processes of the F/OSS community reflect those emancipatory goals and are essential for the sustainability of the movement's resource base. Through gift-giving as the basic mode of exchange, those resources are multiplied.

Through several years of observation of the F/OSS community, archival and secondary research, member discourse and surveys, and other F/OSS related texts, these exchanges have been researched and their dynamics described in Hemetsberger (2002). With free sharing of ideas among consumers, free access to information and free exchange of products and services, the Internet has enabled a structural shift of power from sellers to users. The F/OSS movement owns a very powerful resource, that of a 'global brain'. Power in online exchange relationships is not contingent upon the possession of resources but instead upon the capability and ability to combine and deliver resources in a way that meets the needs and expectations of others. Knowledge resources that are hoarded for the purpose of exerting power are useless in online exchange. Exchange of knowledge is facilitated through powerful Web-based tools and groupware, and individuals can benefit greatly from these resources. During this learning process constant interaction with others also strengthens social ties and leads to close friendships. Giving back and contributing to the community then becomes "the natural thing to do". Individual contributions are rewarded by reactions of community members who appreciate the contributions. With every piece of work submitted, feedback is provided within hours or even minutes

(Lakhani and von Hippel, 2000). Social approval plays a decisive role in the F/OSS community.

An even more powerful motivator are the responses of hundreds, thousands, sometimes even millions of people downloading and using the software someone has written and provided for free. This is probably the most powerful motivator one can think of, the knowledge that one's work has a global impact. The extent to which esteem needs are met via responses on the Internet is unprecedented. The problem of free riding, therefore, does not exist in the F/OSS context. On the contrary; the more people all over the world use and appreciate the outcomes of the collective effort, the more the contributors feel empowered, and their efforts become worthwhile. A considerable amount of resources and rewards are 'for free', for instance the source code and other learning facilities. Social 'assets' are harder to gain and have to be earned through engagement and good code. However, in a global community there is an abundance of 'social assets' for valuable contributions. Power in the OS community relies on freedom, not on dependence and is based on abundance of resources, not on their scarcity.

Abundance of resources, however, is only possible when enough people are willing to contribute and share their work and expertise freely. The sustainability of a collective effort not only depends on the rewards gained, but also on the culture lived within a community (Anderson et al., 1999). The community's norms and belief systems provide important anchors at the value-level and hence, helps to stabilize the system of exchange. The liberal and humanist culture, widely based on the notion of freedom, attracts many enthusiasts who otherwise lack opportunities to realize their ideas. Culture, in order to be passed on, must be highly visible. The community gains visibility through a culture of openness combined with clear rules and norms of exchange, which manifest themselves in

every aspect of community life. These processes, as depicted in Figure 1, exchange of software, knowledge creation, public significance, relational exchange, passage of culture, constitute a self-sustaining system of exchange and ensure a steady flow of resources for collective action.

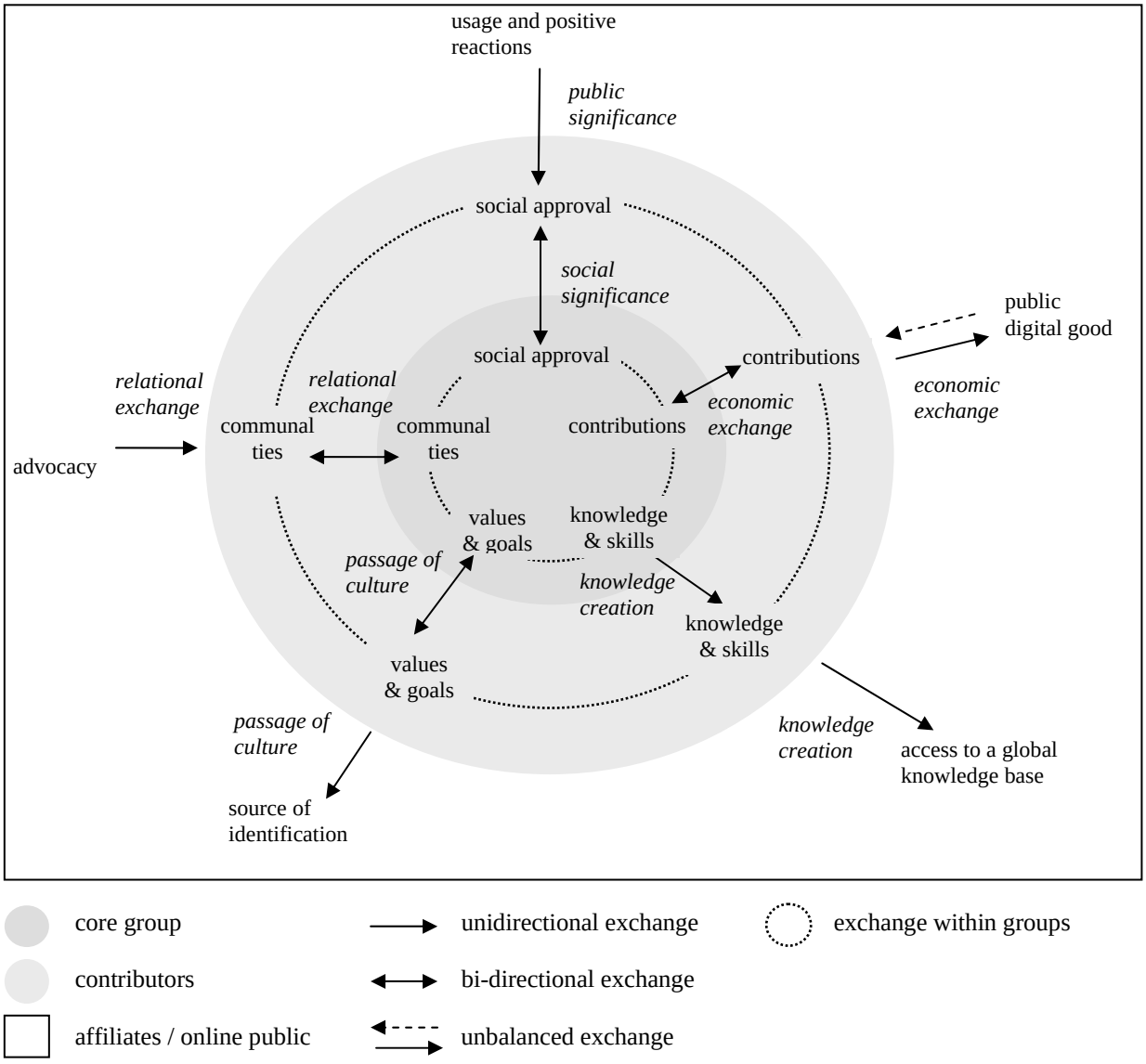

Figure 1. Social Exchange in Online Consumer Communities of Practice

8.3 MOBILIZING KNOWLEDGE RESOURCES

Knowledge, as the F/OSS community's most valuable and important resource for collective action, has been given particular consideration in this body of research. This section on knowledge resources encompasses three main areas of investigation: (1) how are individual learning processes supported in the F/OSS community? (Hemetsberger and Reinhardt, 2006a, forthcoming), (2) how do members and affiliates share and create knowledge online? (Hemetsberger and Reinhardt, 2004; 2006b, forthcoming), and (3) how does the community support the integration and retention of aspirant members? (Reinhardt and Hemetsberger, 2006, forthcoming).

8.3.1 Facilitating Individual Learning

Apart from yearly conferences or meetings, free and open-source software developers rarely meet face-to-face and are dispersed all over the globe. Several F/OSS projects have been operating online for many years. Until now developers have been primarily relying on text-based workflow applications, groupware, and online communication tools. An initial area of interest regarding the mobilization of knowledge resources, therefore, refers to the question how those communities initiate and foster learning processes on the individual level; how they effectively exploit the advantages of Internet technology and at the same time are able to cope with the problem of the tacitness (Polyani, 1966) of much of the knowledge involved in source code development. The objective of this research (Hemetsberger and Reinhardt, 2006a, forthcoming) is to investigate how Internet technology is used to foster individual learning processes that lead to collective knowledge building online. The empirical study has been conducted in the KDE desktop developers

community. An interpretive case study approach has been applied to investigate how the community organizes individual learning processes and knowledge building.

A social-experiential view of learning has been applied in order to examine the reflective inquiry processes and collective learning practices. According to this view, learning is a process whereby knowledge is created through the transformation of *experience* (Kolb, 1984). Dewey (1972) contends that experience is the transaction between individual and environment. It is the continuous and mutual formation of the two, and as such, experience is both a process and a product (Elkjaer, 2004). Experiential learning theory (Kolb, 1984) has further elaborated on the ideas of experience and inquiry. It promotes the idea that learning and cognitive growth proceed along two continuums, the concrete-abstract, and the reflective-active. The concrete-abstract continuum describes how individuals gather information from the environment whereas the reflective-active continuum refers to how individuals process the information they gather. New information may be grasped through *concrete experience* via our senses, or through *abstract conceptualization*, which includes thinking, analyzing, or planning systematically. Transformation processes of learning are carried out either by *active experimentation* which is typically characterized by jumping right into doing things, or by *reflective observation* on what is happening (Kolb, Boyatzis, & Mainemelis, 2000).

Our research findings suggest that members of innovative online communities learn and build collective knowledge through the use of 'technologies' and the establishment of discursive practices that enable virtual *re*-experience (Hemetsberger and Reinhardt, 2006a, forthcoming). From an individual perspective, learning is initiated by displaying information rich content in a structural and sequential order, as well as by instructive content and discourse. We found participative practice, collective reflection, and virtual

experimentation processes to be fundamental for collective knowledge building. Knowledge manifests itself online through a variety of content, as well as through online discourse. Our analysis further documents how those manifestations of knowledge initiate individual processes of learning and collective knowledge building (see Table 4).

Displays and manifestations of knowledge	**Technological tools**	**Initiated processes of learning and knowledge building**
Code	CVS repository	Full cycle of re-experiencing: Concrete experience Reflective observation Abstract conceptualization Active experimentation
Transactive group memory	Website content and hyperlinks (e.g.: FAQs, content) task-related archives and repositories (e.g.: the CVS) weekly digests archived discourse (e.g.: newsgroups archive, mailing list archive)	Productive inquiry Reflective observation
Instructive content	Online tutorials and screenshots Bug reporting system, CVS change log and diff application	Active experimentation Reflective observation Participative Practice
Instructive discourse	IRC (Internet relay chat)	Reflective observation Collective reflection
Reflective discourse	Asynchronous communication (e.g.: mailing lists, newsgroups)	Collective reflection Collective conceptualization Virtual experimentation[1]

Table 4. Learning Processes Initiated and Displayed Through Technological Tools (Source: Hemetsberger and Reinhardt, 2006a, forthcoming)

[1] Herein, *virtual* experimentation is used as synonym for mental experimentation with abstract concepts in mind, which are not yet existing.

8.3.2 Sharing and Creating Knowledge

How members of the F/OSS community are *sharing* and *creating* knowledge collectively, is a second topic related to knowledge resource mobilization. We approached this research objective with a social view of learning and knowledge creation (Hemetsberger and Reinhardt, 2004; 2006b, forthcoming). The social view promotes the idea that knowledge is deeply embedded in the technological and social context of a community that creates and reproduces knowledge (Nonaka and Konno, 1998; von Krogh, Ichijo and Nonaka, 2000). According to social constructionist theory, people construct knowledge as they interact in a social context. Knowledge is information combined with experience, context, interpretation and reflection (Davenport and Prusak, 1998). Hence, collective knowledge creation comprises shared experience, shared context, and communication about interpretations and reflections on the information and knowledge. Knowledge is dynamic, relational, and based on human action, thus, it depends on the situation and people involved rather than absolute truth or hard facts (von Krogh et al., 2000). If we adhere to the social constructionist view, then knowledge creation is genuinely dependent on an enabling context – technological and social – where individuals form relationships, are acting together, collectively share and reflect on their individual knowledge and beliefs.

Findings of a netnographic inquiry into the KDE community (Hemetsberger and Reinhardt, 2004; 2006b, forthcoming) show that this enabling context is shaped and constructed through cultural norms and rules, as well as through the use and adaptation of Web-based technology. For newcomers, in order to become knowledgeable members, a balanced mixture of guiding norms and open organizational structures has been established. The primary challenge to knowledge sharing and creation processes online is

the difficulty to engage in face-to-face discourse and reflective practice. The research findings suggest that F/OSS communities are able to overcome this challenge through creative ways of initiating double-loop learning (Argyris, 1992) through social interaction and competent use of technologies (Schön, 1999). F/OSS contributors engage in talks and discourse with their fellow programmers that are geared towards co-constructing problems and ideas, using source code, metaphors, examples, analogies, and mental models. However, in order to stimulate the others' thoughts and trigger further ideas, those 'means of transforming' tacit knowledge have to employ metaphors and examples from the other learners' world of thinking for them to be able to comprehend (Bechky, 2003). Furthermore, discourse revolves around the construction of, rather than finding a solution to, a problem or an idea. Minor programming tasks that can be solved with the help of a more experienced programmer are solved in a direct manner by simply asking the community. However, when new knowledge is to be created, discourse is open and devoid of thinking in terms of solutions. By avoiding solution-oriented thinking, the community encourages creative thinking and self-determined acting of F/OSS programmers. Depending on what a discourse is aiming at, F/OSS members also use different channels of communication. For coordination purposes, extant content is provided on the Community site, and IRC chatrooms are used for quick help. For the purpose of cooperation, communication and groupware tools have been established. However, for knowledge creation purposes, asynchronous communication technologies, such as discussion forums and mailing lists are used in order to make community members think before they act and respond. In order to be successful in that respect, a strong culture of freedom, openness, and helpfulness has been promoted throughout the history of the community.

8.3.3 New Member Integration

An assertion in much of the literature on F/OSS is that the success of a project in terms of producing the software relates to the growth of the developer community (Moody, 2001, Raymond, 1999, Sawhney and Prandelli, 2000). The sustainability of the F/OSS movement, therefore, genuinely depends on a constant inflow of new members. These aspirant members must be culturally integrated and taught in order to become expert members. This, in turn, increases complexity. Hence, project coordination and new member integration must be sophisticated, yet simple. In a third part of our studies into the mobilization of knowledge resources in F/OSS communities, we investigated how new member integration is pursued in the community (Reinhardt and Hemetsberger, 2006, forthcoming).

Our research has supported the assumption that successful cooperation in F/OSS projects is ultimately linked to two crucial factors, which many organizations are lacking: self-determined learning and access to a global pool of interested, aspirant members. Knowledge about social norms and rules needs to be shared among members to facilitate learning and the creation of new knowledge. Aspirant members usually lack knowledge of social norms and technical expertise. Hence, the community has to establish procedures that allow newcomers to move towards full participation in the socio-cultural practice of such a community. These processes may be subsumed under the concept of ‘legitimate peripheral participation’ (Lave and Wenger, 1990). Central to this concept is not to regard learning as being taught or instructed, that is, learning about practice, but rather as becoming a practitioner (Brown and Duguid, 1991). Learning takes place through observing practice, how other members of the community achieve their tasks.

Newcomers first have to assimilate the norms and values of the community and analyze the activity of the experts before they are able and capable of contributing to the group. In this first phase of integration, people can participate in different ways and to different degrees. Newcomers may then take different roles in the status hierarchy of the community, depending on their level of expertise. As aspirant members proceed from novice to a more proficient learner, the way in which they acquire new knowledge tends to differ. Drawing on Dreyfus and Dreyfus (1986), we identified five stages of member integration into the community (Hemetsberger and Reinhardt, 2006a, forthcoming).

In a first and very sensitive phase, aspirant members need rigid and clear guidance, although without discouragement, and without distracting competent and expert members. It would be disastrous for the community if expert members had to take over a mentoring role for thousands of interested learners. On the other hand it is vital that aspirant members are supported. Explicit rules and clear guidance on easy-to-find websites in the form of FAQs, policy statements, and several other online documents help to manage the first stage of entry.

The second stage is characterized by ‘enabling experience’. These first ‘plunges into experience’ must, firstly, exactly simulate real-life programming in order to be of help in more advanced stages, but at the same time be presented in small, digestible pieces of work. With the help of tutorials, learners get immediate feedback on their efforts as they can compare their outcomes with those of an expert. Even in this phase, person-to-machine interactivity is able to partly replace person-to-person contact. Furthermore, this stage is characterized by intensive observation of the community, of discourse and code. By doing that, the advanced learner is able to re-experience task-related and social practice.

Knowing how a community cooperates and coordinates their efforts is important before being able to actually participate and contribute. Thus, the next stage is dedicated to becoming a practitioner and eventually gaining full access to the source code. With entry into this stage, status and pride come into play. This is where an important role transition from the advanced beginner to the competent contributor takes place. This phase is characterized by legitimate peripheral participation, review and feedback. It ultimately results in being granted write access to the source code repository and full integration into the community.

In the next two stages, although still learning stages, the roles between learners and mentors are reversed. Here proficient members and experts take the role of mentors for those who are less experienced and give valuable advice to requests in the mailing lists. Their archived discourse also provides a helpful source for learners who are searching the site for answers to their questions. However, these stages are also characterized by ‘compressed experience’ and ‘skilled incompetence’ (Dreyfus and Dreyfus, 1986). Therefore, continuous, ongoing reflection in a double-loop manner is crucial for the success of the community effort; F/OSS communities open up their work and their thoughts to the world in order to overcome these potential drawbacks. Openness, in every sense of the word, is crucial. New knowledge hardly emerges in frozen environments but more easily springs out of diversity and a multitude of participants, which can only occur in loosely integrated systems where there is room for controversies and multiple views.

8.4 THE FORMATION AND MANIFESTATION OF CULTURE

8.4.1 The Formation of Innovative Online Consumer Communities

In an attempt to grasp the forming process of online gatherings of consumers, a theoretical conceptualization of the formation of creative online consumer communities has been elaborated (Hemetsberger, 2001b; 2003). It aims to understand the dynamics of consumer collective action and provides an overview of the environmental and social context of collective action, the social actors involved, and the process of creating shared meaning. If we assume that collective action does not occur coincidently, the question has to be raised as to how this process of community formation can be traced.

The conceptual articles proceed along the following lines of thought (Hemetsberger, 2001b; 2003). Voluntary cooperative work is not a straightforward social process whose stability can be taken for granted. Each single case of group formation is uniquely influenced by its contextual forces and the events happening during that process (Peterson, 1998). Kuwabara (2000) described the development process of the Linux community as a memetic replication of the genetic structure induced by the founder's idea. Research shows that, apart from sharing a common interest, group structures have to be developed and maintained through discursive processes (Staeyert et al., 1996; Stephenson, 1995; Kozinets, 1999). Consequently, the formation process of F/OSS communities has been conceptualized as a process, which is influenced by particular events that shape the social condition of the community, and by environmental and internal social actors (Tilly, 1998), who engage in communicative processes that bring forward social representation of what is considered the to be the F/OSS movement (Hemetsberger, 2001b). Hence, there is an individual sphere of behavior and formation of meaning involved, and a social sphere of thinking and acting (see: Figure 1).

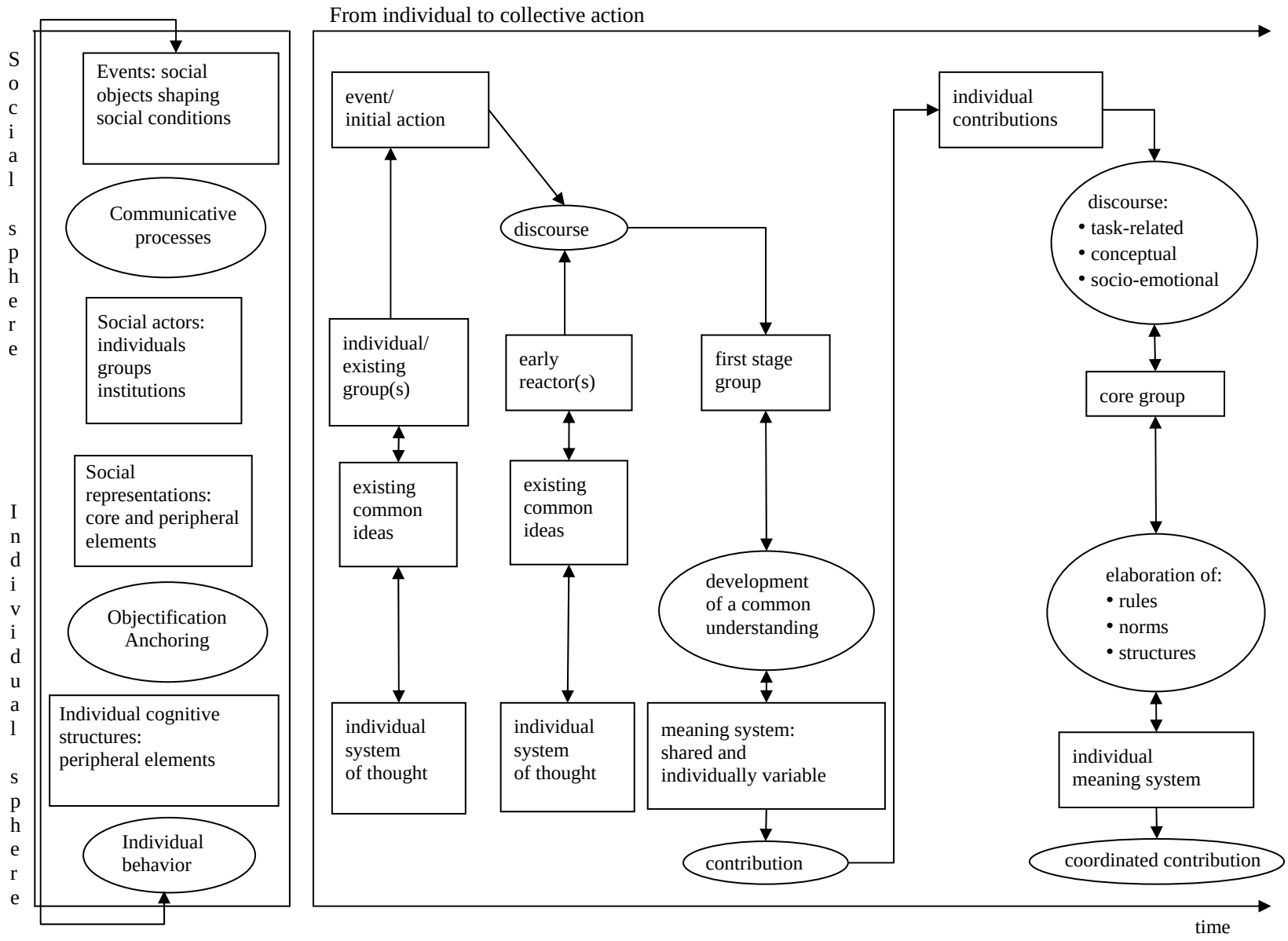

Figure 2. Individual and Social Processes of the Formation of Collective Action

Marwell and Oliver (1993) have emphasized the role of especially motivated and resourceful individuals in the beginning of group formation, who set collective action in motion. These core members of the community often take over the role of leaders, evangelists, and protagonists of the movement. Interpersonal relationships, then, are formed through communicative acts which are task-related, socio-emotional, and conceptual in nature (Sudweeks and Simoff, 1999). Whereas task-related communication deals with explicit work to be accomplished, socio-emotional talk is important for relationship-building and for social bonds to emerge online. Conceptual discourse focuses on the creation of meaning and involves the negotiation of rules and norms. Communication is considered a central process in the construction of shared meaning and an overt sign of social interaction and group formation. Another indicator for group formation is the existence of 'meeting places' (Rheingold, 2000), which are extended to social spaces for discourse and action.

The ability of the Internet to bring together people, who share the same interests and grievances, might have been decisive in the emergence and development of the F/OSS community. Individuals join the group because they are attracted by the members of the group, by the common goal, and by other benefits they hope to gain through membership. The liberal, democratic, and gift-giving characteristic of the F/OSS culture has provided a fertile ground for the movement's growth. At this stage, the social integration of aspirant members is crucial in order to ensure the pursuance of the movement's goals. Rules of exchange, norms of practice, values and meaning are conveyed by means of narratives, metaphors, symbols, discourse, and overt action. Cultural codes are elaborated for new members to gain a shared understanding of the common goal, for community members to keep track, and for non-members to signal the boundaries of the community.

8.4.2 Adversary Consumer Innovation and Cultural Codes

The last area of research described in this synopsis refers to the cultural particularities of resistive creative online consumer communities, exemplified by the F/OSS movement (Hemetsberger, 2006, forthcoming). Years of observation have led to an in-depth insight into the subtle balancing of traditional and universalist cultural codes of the F/OSS community. The theoretical underpinning of this research departed from the notion of collective action either as a simple reaction to social and environmental constraints, or a strategy of appropriation in response to structures of domination, as suggested by Poster (1992). Particularly the new communal and creative forms of online consumer movements not only exhibit rebellious acts against the prevailing capitalist practices and forms of consumption. There is an equally strong tendency to engage in active co-construction of alternative market structures. Adversary innovation substantially differs from boycotting and consumer resistance in its active, positive approach towards social change. Contrary to anti-consumerism or anti-capitalist movements (see: Kozinets & Handelman, 2004; Rumbo, 2002), the emphasis is not primarily on attacking or destroying products, ads, and established market structures, but to radically alter and introduce new elements to it. Whereas many other forms of resistance rely on propaganda and revolutionary utterances, innovative consumer communities construct a culture of creativity and collaboration; they actively do something about the source of their grievances. Furthermore, the impact of online consumer movements might be far more effective due to the networking effect of the Internet. The Napster file-sharing community (Giesler & Pohlmann, 2003a; 2003b) and the F/OSS movement, for instance, owe much of their global expansion to Internet technology.

Internet technology provides a further advantage with regard to collective action. Consumers emancipate themselves from the market, firstly by creating a distinct common space which is protected from external control or oppression (Melucci, 1996). Secondly, within this 'Noo-sphere' (Raymond, 1999), market-imposed codes and rules are flip-flopped and juxtaposed with a culture of free exchange and gift giving. Recent consumer research provides mounting evidence of how people are making use of online emancipatory spaces for collective action, and how they establish counter-cultures that reflect these common goals (Kozinets, 2002b; Hemetsberger, 2002; Giesler & Pohlman, 2003a; 2003b; Giesler, 2006, forthcoming). In an attempt to escape the ideological influences that sustain a capitalist economy (Thompson, 2004), and in order to regain control over one's own consumption behavior, counter-ideologies are established with the aim of opposing dominant market forces. Melucci (1996) contends that movements establish their ideological foundation through the elaboration of cultural codes and language. In order to reproduce culture, these codes are regularly revitalized in discourse.

Findings of the research into the extended ideological discourse of the F/OSS community have shown that the movement applies two fundamental categories of cultural code, which are dialectical in nature (Hemetsberger, 2006, forthcoming). One is directed towards the conservation of a pure ideological core and constant redirection towards the historical roots of the movement. Hence, it excludes. Its counterpart emphasizes integration, pragmatism, and progression. Due to their dialectical character, the ideological codes of the movement provide oppositional energy that fuels a constant stream of discourse and action.

Traditional codes are confronting and they draw a picture of the world as a given. They presume that the revolution is necessary and that community members are not to

blame for any hostilities because they are fighting the good fight. Resistance seems natural, as the history of the movement has shown that it is necessary. Traditional cultural codes are distributed in a very ambitious and evangelistic manner with an orthodox undertone. Discourse is lively, provocative, and full of flame wars. One important function of traditional codes is to depict the adversary, which is symbolically articulated by the use of accusations, presumptions, and exaggerations. Other functions relate to the sanctioning of violations of cultural core values, and as a reminder of those values. Violations are subjected to codes of purification. Traditional codes serve to constantly recharge the ideological core and educate aspirant members.

The F/OSS movement has also developed *universalistic codes* (Giesen, 1999), which are primarily oriented towards a societal change through emancipation, progression, and reasoning. The idea of 'salvation from the evil empire' by giving represents a very powerful cultural code in the community. By generously giving their products and its source code away for free, F/OSS developers create an abundance of economic, cultural, educational, and symbolic capital (Raymond, 1999), which liberates consumers from being indebted and constrained. Hence, the free flow of those assets lies at the core of the community's liberation from the stranglehold of the market. Through the cultural codes of integration, educationalism, and pluralism, the movement establishes a counterbalance to the traditional codes.

Textual discourse has revealed diverse forms of resistance. Distinguishing the good from the bad is an important prerequisite for the resistive character of a movement. Hence, one form of functional discourse revolves around remembrance, advocacy, and even religious zealotry of the movement's ideological core. Its function is to reproduce what is experienced as the natural order of things (Thompson & Haytko, 1997). Another function

is to produce texts with subversive meaning, incorporating provocative elements, drawing attention to inconsistencies (Hardy, 2004), or problematizing interpretations of culturally prevailing meanings (Thompson & Haytko, 1997). Emotional struggles are drained off by being displaced onto symbolic enemies (Geertz, 1973 [2000]). These codes are important for depicting the scapegoat and upholding the adverse character of the opponent.

Discourse is also directed to foster collective reflection and to fuel revolutionary energy. Codes of exclusion fulfill the tasks of securing the ideological core, preserving the historical roots, depicting the adversary, drawing distinctions to market forces, and safeguarding the morale. Hence, codes of exclusion tend to be conservative and traditional with respect to a movement's core ideology. Successful movements, however, develop counterbalancing cultural codes, which enable them to grow. Hence, codes of integration are beneficial for sustainability. They foster pragmatic action, provide future perspectives, and invite the masses.

The research into the cultural underpinnings of the F/OSS movement has tried to advance a theory of new online consumer movements by introducing a more positive, and active form of adversary action into the literature on consumer behavior– the innovating consumer. Hemetsberger (2006, forthcoming) has carved out the ideological core of the adversary innovation of consumers. She has further contributed to correct the tendency in literature to implicitly view resistive consumers as being entangled in contradictory forms of consumption, engaged in constant controversy with the market, with only temporary escapism. The article re-introduces the idea of consumer sovereignty by showing that consumers engage in online collaboration and innovation. Furthermore, this research contends that the movements' actions are geared towards gift giving (Hemetsberger, 2002; 2006, forthcoming), which liberates them from the economic cost-calculation rational, and

offers a different model at a cultural and symbolic level. New online movements are depicted as cultures, which are based on an abundance of symbolic and material wealth.

9 CONCLUSIONS AND FUTURE RESEARCH

The body of research presented has contributed substantially to the understanding of collective action of online consumer communities. For the first time in consumer behavior literature, collective action of consumers has been depicted as a positive, active, and creative endeavor with the aim of altering existing market structures and introducing different business models. It has further contributed to a different view of consumers, not as passive recipients, but rather as active creators of consumer culture, of valuable knowledge resources; as self-determined individuals, who are striving for meaningful action and self-realization; as responsible actors, who engage in social exchange and giving gifts; and as producers and distributors of high quality goods. An integrative approach to collective action formed the basis for understanding *how* consumers organize their actions and acquire valuable resources for action. The fact that members of virtual communities of interest self-select and voluntarily contribute to a collective effort on the Net provoked an inquiry into the *why*, the motivation of member participation.

Contrary to former investigations into the motivations of F/OSS programmers, Hemetsberger and Pieters (2001) applied a perspective of voluntary work motivation, and introduced the notion of a gift giving community. Applying an interpretative approach also brought forward the particular motivational structure of different groups of contributors to the collective effort. Hemetsberger's (2005) work on self-realization of F/OSS developers brought further attention to the specificity of the online world, and its particularities with regard to member motivation. Looking at the level of publicity and 'eternity' of the virtual

realm, helps to explain why so many community members are so deeply involved in the collective endeavor.

The investigations into the social exchanges of the F/OSS communities (Hemetsberger, 2002) further contribute to understanding the dynamics of resource mobilization. Social rewards, together with the exchange and creation of knowledge, provide the most important social assets of the community, and ensure a steady flow of resources. In addition to current literature on knowledge creation in F/OSS communities, Hemetsberger and Reinhardt (2004, 2006a; 2006b, forthcoming; Reinhardt and Hemetsberger, 2006, forthcoming) have extended the current view of collective knowledge creation to a dynamic, triadic system of actors, technology, and culture. Furthermore, a five stage model of new member integration has been presented that describes knowledge resource mobilization of online movements, and how a constant influx of new members is ensured.

Lastly, this body of research also encompasses a description of the formation of such online movements, and the dynamics of ideology proliferation. This research, therefore, contributes substantially to the field of emancipative and resistive consumer action. It has introduced the notion of adversary innovation to the literature, and explains its ideological underpinnings. Discursive processes of maintaining the resistive character of the movement have been researched and described in depth. Furthermore, a future outlook has been given as to how consumers might extricate themselves from the asymmetric power and dominance in the market, and live a self-determined life as a consumer. Hence, it also contributes to the emerging field of transformative consumer research.

This body of research will be extended in the future by a discussion of how such online consumer movements can succeed in other areas of production. First research

evidence shows that consumers are also highly successful in the creation of material goods (Füller, 2006). Furthermore, first investigations are underway, which aim to explore the ways in which the F/OSS movement can successfully alter existing market structures by either cooperating with major industry players, and/or by independent community endeavors. First empirical evidence shows that the definition of boundaries between corporations and community projects are crucial. Secondly, similar cultures seem to support cooperation between the capitalist world and the community sphere. Furthermore, a study is planned that investigates the way in which the F/OSS community and similar phenomena might contribute to redefining contemporary capitalism. The changing roles of producing and consuming entities will be described and their implications for a more authentic way of doing business will be discussed in this work.

Future research into the emotional bonds that innovating consumers are developing not only with their online community, but also with the brands they have collectively helped develop, promises to become a major field in consumer behavior research. Linux has recently been characterized as one of 12 global cult brands (Tumbat and Belk, 2005). ‘Consumer(-owned)’ brands of this kind are earning a lot of sympathy in the market, because they are perceived as authentic. Research, particularly into the facets of brand authenticity, its meaning for the brand interest group, and the manifestations of those brands (Mühlbacher et al., 2006) will constitute my main area of research in the near future. The issue of consumer devotion to brands has already been conceptualized, and is awaiting further empirical research (Pichler and Hemetsberger, under review).

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