Fostering cooperation on the Internet: social exchange processes in innovative virtual consumer communities

Andrea Hemetsberger*

competitive paper
presented at the annual ACR (Association for Consumer Research) conference 2001 in Austin, Texas

long abstract published in: Broniarczyk, S. M. and K. Nakamoto (eds.), (2002). Advances in Consumer Research, Vol.29, 354-356.

* Contact person: Andrea Hemetsberger
Assistant professor of marketing
Department of value-process management
Marketing group
Innsbruck University
Universitätsstraße 15
6020 Innsbruck
Austria, EUROPE
phone: 0043 (0)512 507 7213
Fax: 0043 (0)512 507 2842
e-mail: andrea.hemetsberger@uibk.ac.at

Acknowledgements
This research has been supported by a Marie Curie Fellowship of the European Community program "Improving Human Research Potential and the Socio-Economic Knowledge Base" under contract number MCFI-1999-00864. The research on which this paper is based was conducted while the author was on sabbatical leave at the department of marketing at Tilburg University, the Netherlands. The author would especially like to thank Rik Pieters for his helpful comments and Ken Coar for making his survey publicly available on which the empirical analysis is based.

Fostering cooperation on the Internet: social exchange processes in innovative virtual consumer communities

Abstract

Virtual communities of consumers increasingly engage in voluntary collaborative production of digital goods and services which became highly successful in recent years. This paper offers a theoretical conceptualization and empirical evidence of the key elements and processes of exchange in those communities. Within a culture of gift-giving and generalized social exchange, knowledge as the main resource of the community is multiplied by giving it away freely to others and thus, fosters contribution behavior. Friendship, peer reputation and external feed-back provided by a global user community represent highly motivating social rewards which, combined with individual gain of knowledge, constitute a self-sustaining system of exchange.

Fostering cooperation on the Internet: social exchange processes in innovative virtual consumer communities

INTRODUCTION

There is wide agreement in marketing literature that creating value for customers is at the core of the marketing effort (Kotler, 1997). Whereas – until recently - most marketing research explicitly or implicitly has restricted value-creation to innovation, production and delivery processes of products and services by organizations, there is increasing academic discourse about consumption as a value-creating activity (Tzokas and Saren, 1997; Holbrook, 1994; Holt, 1995; Firat and Venkatesh, 1995; Gummesson, 1998). It has been argued that consumers' involvement in value creating activities is still underestimated and constitutes a gap in marketing theory (Tzokas and Saren, 1997). Remarkable exceptions can be found especially in the relationship and services marketing literature (Kelley et al., 1990; 1992; Schneider and Bowen, 1995; Wikström, 1996; Bettencourt, 1997) as well as in lead-user research (von Hippel, 1988; 1998; Lakhani and von Hippel, 2000). However, the possibilities of customers for joint value creation as a co-producer is limited to the characteristics of the product or service and to their own unique means of value creation in their own domain. The rapid growth of new communication technologies has changed these limitations dramatically and "new possibilities are emerging that did not exist before." (Firat and Venkatesh 1995, p.239). On the Internet information and digital goods, such as music or software are easily and inexpensively accessible for consumers. Moreover, it allows consumers to engage in social interaction with other consumers, exchanging information and collectively creating knowledge. Consumers increasingly engage in collaborative production of

goods and services on the Internet ranging from music compilations, computer games, and searchable on-line databases to the collective development of software.

As producing consumer groups do not need to make major investments, besides a computer in a network and their brains, they are no longer dependent on firms producing digital goods, but instead jointly create and exchange digital products themselves. Furthermore, and even more important, they produce digital goods and provide on-line services that better fulfill their own needs. Virtual communities of creative consumers, therefore, dramatically challenge the hitherto prevailing view that the sphere of production is separated from the sphere of consumption (Firat and Venkatesh, 1995). In view of these developments customer-orientation is given new meaning and the contents and processes of exchange between companies and customers will have to be reconsidered if firms want to keep their customers and cooperate with them.

Establishing and maintaining mutually rewarding exchange relationships is considered an important prerequisite for successful cooperation (Morgan and Hunt, 1994). Establishing and maintaining a cooperative relationship with producing consumers, therefore, requires a holistic understanding of (1) what consumers consider as rewarding and (2) how to maintain a mutually beneficial system of exchange on the Internet over time.

The purpose of this paper is to conceptualize and explore the specific contents and processes of cooperative exchange relationships on the Internet. First, a brief description of the background and social structure of a successful creative community – the open-source community - is offered. Second, exchange contents and processes in producing virtual communities are conceptualized. Exploratory evidence is based on more than 1400 responses to an Internet survey with open-ended questions among members of the open-source community.

Finally, the typical exchange processes in innovative virtual communities are traced, and its implications discussed.

THE OPEN-SOURCE COMMUNITY

One of the most intriguing and insightful examples of on-line joint-production is the immense productivity of the open-source community and the global success of open-source software. Thousands of expert programmers and millions of users worldwide voluntarily work on new and on the improvement of existing open-source software. The distinctive element of this effort compared to other free provisions of digital goods is that the core of software innovation, the source code, is included. Historically, the free software culture around its prominent protagonist Richard M. Stallman who was working at MIT Artificial Intelligence Laboratories started as an anti-commercial and 'software wants to be free' movement. However, there was always also a more pragmatic strain, loyal to open-source but not because of its ideology but founded on the striving for technological superiority and the belief that open-source is the better way to achieve this goal. However, in either group the genuine culture of sharing of ideas, free exchange of information and free speech (Berners-Lee, 2000) of the early 'hackers' who invented the World Wide Web is still prevalent.

One of the most prominent examples of open-source development is the operating system Linux which by now is said to be one of the main Web server platforms worldwide. The Linux kernel has been programmed from scratch by a former Finnish student who published the source code on the Internet and attracted hundreds and thousands of professional and hobbyist programmers to contribute code and improve on the new kernel of the Unix-like operating system for PC's. Like every other 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 have to make their contribution also freely available as well as not to impose any licensing restrictions to others.

Although the first Linux distributions already started in 1994, it took some time for the wider public, including the press, governments and the computer industry, to react. At this time, the open-source initiative was brought into existence in order to provide an organizational platform for cooperation between the developer community and companies. By now, Netscape, Sun Microsystems, to name some of the most prominent corporations, have released the Mozilla and StarOffice source code, several other hard- and software providers have ported their products to Linux, some of the most powerful companies in the computer industry actively work together with open-source developers, and Linux distributions, like Red Hat, Caldera, Debian, Mandrake, or SuSE are growing rapidly. Linux was by far not the first open-source project and, in the meantime, thousands of other open-source projects are coordinated on-line.

Developers and users of open-source software are often referred to as 'the open-source community' (OS-community). 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 and 'real' platforms where intense everyday interaction and discourse takes place. Thus, they build a group of people who share social interaction, and a common 'space' (Kozinets, 1999). Furthermore, members of the open-source community share a common interest which fits Armstrong and Hagel's (1996) definition of virtual 'communities of interest'. However, the open-source community constitutes not one 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 strivings but committed to specific projects (van Rossum, 1999; Raymond, 1999). Depending on the size of the project there is either one developer team or a bigger community consisting of a number of contributors gathering around a core development team. Apart from these core teams and developers that build the center of the innovative effort a huge number of affiliates gather around those groups, their products and ideas. Their degree of social interaction and contribution varies considerably, thus the term community seems to exaggerate the social bonds that exist in reality. What is called the open-source community may be better thought of as an online social network of people interacting with each other continually (Rheingold, 2000) with varying degree of social interaction and feelings of belongingness.

THEORETICAL BACKGROUND

Models and rules of exchange

For decades, marketing has been described as the process of creating, resolving and maintaining exchange relationships (Bagozzi, 1974). This involves a "set of social actors, their relationships to each other, and endogeneous and exogeneous variables affecting the behavior of the social actors in those relationships." (Bagozzi, 1974, p.78). The basic assumption is that individuals are compelled to participate in an exchange relationship in order to satisfy their needs (March and Simon, 1958; Bagozzi, 1975). Apart from other important stakeholders, meeting the needs of customers has always been at the core of the marketing effort. Fulfilling customers' needs requires knowledge about what, when and how to provide appropriate benefits in order to establish and maintain long-term customer exchange relationships.

Marketing literature offers various conceptualizations about how to design exchange relationships (Bagozzi, 1975; Hirschman, 1987; Morgan and Hunt, 1994; Grönroos, 1999).

However, models of exchange differ considerably in their view about *what* is exchanged between two parties and *how* exchange is influence by various endogenous and exogenous factors. The 'economic model' assumes that things are exchanged for their economic or utilitarian value, whereas according to the 'social model' exchange takes place on the basis of the symbolic value attached to things (Ekeh, 1974).

Both views assume that individuals engage in exchange to achieve certain important goals that are extrinsic to the behavior they engage in. Extrinsic or instrumental rewards are a motivation source when individuals believe that behavior will lead to certain valued outcomes, utilitarian and/or symbolic. Social interaction is viewed as an exchange of mutually rewarding activities in which the receipt of a needed valuable is contingent on the supply of a favor in return. Expectations of reciprocity are based on the rational grounds that individuals evaluate the input/output ratio of a certain behavior in relation to a referent other. Equity theory (Walster et al., 1978) assumes that people tend to balance this ratio simply by returning appropriate utilitarian and social rewards for the benefits gained. Whereas most economic transactions are simultaneous exchanges individuals, within the social model, rely on and trust each other for future favors. This creates a 'general social indebtedness' that forms the basis of a community (Haas and Deseran, 1981). According to this view sustainable social exchange depends on whether this system of exchange can be kept in balance in general, over time, and across people rather than on an immediate, one-to-one basis.

Organizational theorists agree that people not only apply equity rules but use a variety of principles and values as the basis for exchange (Kabanoff, 1991). Equity, equality or other rules, such as the need principle are called on, depending on the nature of the social context or the social interdependence that is involved. Deutsch (1985) found that in task-directed relationships people tend to adopt distributive principles of equity according to the potential to contribute and

the actual contribution of individuals. In relations in which the fostering of enjoyable social relations is the common goal, equality tends to be the dominating principle. Equality signifies that the different members of a relationship have equal value as individuals, independent of their potential or actual input. The orientation of relationship as its own goal is non-instrumental because the source of actions is based on a person's sense of his or her relationship with the other person, rather than on a judgment of that person's contribution. It has been argued that equity emphasizes productivity, whereas equality emphasizes solidarity and long-term relationships (Kabanoff, 1991).

Relationship marketing radically departed from the economic transaction view to the concept of relational exchange, which reflects an ongoing process (Morgan and Hunt, 1994). Emphasis is put on long-term relationships between partners and therefore, especially on the contents and processes of exchange that maintain mutually beneficial relationships. Corresponding values are important moderators for solidarity and loyalty in relationships (Anderson et al, 1999). Social exchange is not primarily based on expectations of immediate and clearly specified rewards but rather on unspecific and general hope for social approval. “Most people like helping others and doing a favor. Favors make us grateful and our expressions of gratitude are social rewards that tend to make doing favors enjoyable. We tend to reciprocate as we are grateful and feel obligated.” (Blau 1964, p.16). One way that groups and society 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 or should be done* (Cialdini et al., 1990; 1991). Violating injunctive norms makes us feel guilty or creates a feeling of indebtedness, thus we feel obliged to behave according to the group’s rules of exchange (Olsen, 1978). This is what Etzioni (1975) refers to as moral involvement which is the result of internalization of social norms or culturally-based convictions (Durkheim, 1973). In

contrast, individuals act according to descriptive norms when they do *what is done* in a particular situation within a specific culture.

Belk and Coon challenged the paradigmatic assumption of reciprocity in exchange models by asking: "Do we give only to get something in return?" (Belk and Coon 1993, p.393) and introduced the agapic love metaphor as an alternative explanation for gift-giving behavior. Theories of gift-giving, in general posit that the social significance of products arises not solely by being displayed by their owner but rather by being given away as gifts to others (Mauss et al., 1970). “In gift-cultures, social status is determined not by what you control, but what you give away.” (Raymond, 1999, p.99). Although gift-giving within communities also implies that people reciprocate and give back what they are able to give, gifts may also be given without expectations of anything in return. Murninghan et al., for instance, argued that the key difference between systems of reciprocal altruism and volunteering is that a voluntary act rarely includes strong reciprocal expectations. Rather, volunteering may depend on emotional, moral, or empathic feelings that are typically associated with altruism (Murninghan et al., 1993, p.516). Similar arguments can be found in various contributions on prosocial behavior (Thompson and Bono, 1993; Jin, 1993; Fernando and Heston, 1997; van Oorschot, 1999). Individuals learn ‘altruistic’ behavior in the sense of ‘doing something good’ for others. It is not based on expected satisfaction of needs and may even demand the denial of need satisfaction and the sacrifice of personal pleasure. These favors have been described as a pure gift which is not contingent of future reciprocation (Stirrat and Henkel, 1997). However, it has been argued that socially-induced altruism is but one possible cause for doing a favor. Providing help has also been described as intrinsically rewarding, receiving gratification indirectly through the happiness of others (Marwell, 1982). In either case, pure gifts are unselfish and symbolize an intrinsically rewarding

relationship. A perfect gift is unconstrained and unconstraining, that is a pure expression from the heart that does not bind giver and recipient (Belk and Coon, 1993).

However, Stirrat and Henkel (1997) argue that giving pure gifts may also be harmful to the relationship between givers and receivers, if reciprocity is wanted by the receiver but, for whatever reason, not feasible. In this case, individuals who do not have the resources or capabilities to give something back are left in a position of indebtedness and powerlessness. "Pure gifts are good for the giver but, symbolically at least, bad for the receiver…" (Stirrat and Henkel 1997, p.73). On the other hand, if not meant as pure gift but in expectation of something in return givers may feel exploited over time and the problem of free-riding occurs (Olson, 1965). The community then, suffers from the 'social dilemma' which occurs when contributors, then, cease from giving, although everybody would be better off if people contribute. Free-riding constitutes one of the main obstacles for cooperation and volunteering, especially in big groups. There is ample evidence that the proportion of volunteers drops significantly as group size increases, especially when the group is perceived as self-sufficient (Diekmann, 1985; 1986; Murnighan et al., 1993; Fisher and Ackerman, 1998). This may be even more so in a huge global virtual community. Thus, perceived personal benefits as well as a group's culture of exchange and gift-giving and its impact on individual behavior are decisive for success or failure of cooperative efforts.

Exchange processes in virtual communities

Exchange processes and principles are influenced by the specific exchange context (Anderson et al., 1999). Whereas many efforts to provide public goods suffer from the 'social dilemma' (Olson, 1965), this seems to be much less of a problem on the Net. Kollock (1998) and Kuwabara (2000) both argue that the easiness and inexpensiveness of exchange of digital

information on the Internet have profound motivational and behavioral effects. Low distribution costs, and the fact, that a download from the Net does not diminish the value of a digital good, lowers the 'costs' of contribution. The Internet also facilitates exchange by efficiently and effectively bringing together a huge number of contributors and beneficiaries. These are important preconditions which represent an economic argument for collaboration and exchange processes on the Net.

However, these arguments do not explain why creative consumers are investing considerable time and effort in the creation of digital goods, engage in collaboration with other producing consumers and publish their work on the Net instead of buying a ready made product. In view of consumers buying more and more time-saving 'plug-and-play' and 'ready-to-eat' products this seems paradoxical. Possible explanations can be found in the above outline of exchange models and gift-giving as well as in consumer behavior research and literature on volunteering, helping behavior and charitable giving. Table 1 provides a comprehensive summary to guide the reader through the following discussion.

TABLE 1
KEY ELEMENTS OF EXCHANGE AND EXCHANGE PROCESSES

Key elements	**Related concepts & theories**	**Basic assumptions/evidence**
Intrinsic motivation	Task-involvement	Psychological pleasure derived from the active involvement with a challenging task (Csikszentmihalyi, 1997)
	Control	Perceived ability to control the most important conditions of one's life (Thompson and Bono, 1993; Anderson, 1999)
Extrinsic rewards	Personal use-value	Perceived utility of objects of exchange (Bagozzi, 1975)
	Social approval: recognition and reputation	Gaining peer reputation as central incentive to make one's work publicly available (Raymond, 1999)
	Gaining knowledge	Gaining knowledge by means of information exchange and help provided by expert members of the community (Kozinets, 1999)
Meaning of exchange	Expected reciprocity and equity	Cognitive evaluation of the input/output ratio in relation to a referent other (Walster et al., 1978)
	Generalized social exchange	Exchange takes place on the basis of utilitarian

		and symbolic value attached to things (Bagozzi, 1975; Morgan and Hunt, 1994) and creates a general indebtedness (Haas and Deseran, 1981)
	Moral obligation	Reciprocation based on internalized norm or conviction (Etzioni, 1975; Durkheim, 1973)
	Gift-giving	The significance of exchange arises from objects and symbols given away. Gifts are not contingent on future reciprocation (Mauss et al., 1970; Belk and Coon, 1993)
Common goals and values	Shared passion	Communities gather around a common interest, communing in a shared passion (Armstrong and Hagel, 1996; Kozinets, 1999)
	Values	Values as important moderators for solidarity in relationships (Anderson, 1999)
Communal relationships	Group bonds – micro level	Intimate communal ties (Rheingold, 2000)
	Sense of community – meso level	Webs of personal relationships in cyberspace (Rheingold, 1993); Trusting relationship between two or more partners (Grönroos, 1999)

Csikszentmihalyi (2000) provides one answer to this question on an individual level. In general, people report being happier when they are actively involved with a challenging task and less happy when they are passively consuming goods or entertainment. This is especially true for high involvement activities that people undertake to give their life meaning. Schouten and McAlexander argued that those "…activities and associated interpersonal relationships…" are "The most powerful organizing forces in modern life…" (Schouten and McAlexander, 1995, p.43). This is the motivational basis for most virtual communities of interest that self-select and prosper on the Internet. The more central an object or activity is to a person, the more likely the person will be to pursue and value membership in a community. “Communing in a shared passion is the essence of truly communal community.” (Kozinets 1999, p.261). A second factor is the intensity of the social relationships a person possesses with other members of a community. The Net supports a variety of communal ties, including some that are quite intimate (Rheingold, 2000). Depending on the degree of involvement with the activity and the strength of social ties, member participation in virtual communities will vary. An individual’s relationship with the activity and with the community is also central to the continuation of membership.

Anderson et al. (1999) further argue that we enter into interaction with others in an effort to control the physical, social, intellectual, psychological, aesthetic and spiritual conditions of our own life. This argument needs further explanation with regard to the Internet. Due to its very nature and the absence of major legal restrictions, the Internet supports individual control over the conduct of one's activities and group autonomy with respect to the common goals and the organization of the collective effort. Especially in research on voluntary work (Thompson and Bono, 1993) the importance of perceived control as a source of motivation for volunteers is highly emphasized. Voluntary work provides the means to struggle against "… the inability of individuals to significantly alter the state of the world around them and the inability to control their own productive activity." (ibid, p.328). The Internet enabled "a structural shift of power from sellers to users." (Bollier, 1999). But what is this consumer power on the Internet based on?

According to Foa and Foa (1974), an individual's power to engage in an exchange transaction depends on his/her possession of resources. Voluntary virtual work teams own a very powerful resource, the power of a 'global brain'. Research on volunteering in non-profit organizations showed that gaining knowledge and increased career prospects constitute important motivations for volunteers (Thompson and Bono, 1993; Lerner and Tirole, 2000). However, in accordance with theories of gift-giving one can counter argue that power in exchange relationship on the Internet is not contingent on the possession of resources but instead on the capability and ability to combine and deliver resources in a way that meets the needs and expectations of others. Thus, it is the delivery rather than the possession of resources which creates value and is decisive for exchange to occur and relationships to prosper. Knowledge resources that are hoarded as sources of power provide no benefit for either partner in virtual relationships. However, although in virtual communities power relies on giving away knowledge resources instead of possessing or

hoarding them, exchange may nevertheless be motivated by expectations of reciprocations of knowledge resources and/or or social approval.

The question whether individuals contribute to collective on-line production for altruistic reasons or because of economic rationale cannot be answered in general. It rather depends on the actors' needs, attitudes and values and his/her views of how one's own needs and those of others can and should be met. It is thus the individual and group objectives and strivings that are decisive for the specific exchange to occur and the rules of exchange applied. Whereas in literature either different models of exchange and gift-giving are juxtaposed, or one specific model of exchange is preferred for explanation, it is argued here that individuals who give away things to others simultaneously act according to selfish, economic principles as well as altruism. This argument is based on Rheingold's experience that "I find that the help I receive far outweighs the energy I expend helping others: a marriage of altruism and self-interest." (Rheingold, 2000, p.47). What Rheingold describes here is also part of the collaborative ethic fostered in the early Usenet communities and repeatedly reported by open-source 'insiders' (Raymond, 1999).

Individuals also differ in terms of knowledge 'assets' or expertise as well as the social approval, status and friendship received. As addressed in literature on social exchange, helping behavior and volunteering recognition for the expertise and time invested and the contributions made provides one mechanism for elevating the visibility of desired behaviors and creating favorable social consequences for the contributor (Blau, 1964; Stevens, 1991; Fisher and Ackerman, 1998; Raymond, 1999). It is proposed here that the degree to which individuals own a surplus of such symbolic 'assets' determines the behavioral model of exchange and gift-giving and thus, its selfish or altruistic quality. Therefore, the point on the continuum between selfish and altruistic motivations, the specific 'exchange model in mind' will differ and change over time.

This exploratory research aims at uncovering the 'models and rules of exchange' and tracing the exchange processes of virtual producing consumer communities. The main research questions addressed are: (1) what are the key elements and contents of exchange in creative virtual communities, (2) what model of exchange guides the action of the community members, and (3) how do their actions contribute to the maintenance of ongoing exchange relationships. Furthermore, groups with different intensity levels of participation are distinguished in order to detect how those groups influence the meaning of exchange and shape exchange processes within the community.

METHODOLOGY AND DATA ANALYSIS

Reflecting the early stage of research on this phenomenon a qualitative approach seemed most appropriate to gain the full range and depth of insights. Individuals should reveal their thoughts in their own words with as little outside influence as possible. One main assumption behind this methodological approach is that individuals' explanations are coherent wholes in the sense of articulated causal belief structures and "…more or less well moored in the network of your beliefs about life in general." (Antaki, 1988).

To examine the meaning and 'models of exchange in mind' that lead to continuing exchange relationships, a web survey among individuals involved with open-source was analyzed. The survey was designed and administered by a core member of the community which ensured trust and a high response rate. The survey was posted at the most frequented community site - slashdot.com - which ensured that every community member had a chance to know about the survey. Respondents were asked to report freely about their involvement with open-source, their motivations to take part in OS-projects and what kind of projects they are involved in. The main advantages of the method applied mainly lies in its unobtrusiveness, the lack of any

interviewer bias and its 'natural setting' with respect to that group. A potential social desirability bias which very likely occurs in self-report data (Fisher, 1993) was controlled for by guaranteeing anonymity. Thus, respondents had no incentive to present themselves 'in a better light'. In total, 1486 respondents answered the survey. The responses were then published anonymously on the site where the survey was conducted (http://web.sourcery.org/os-survey.cgi).

Out of the 1486 submitted responses 1139 were content-analyzed. Eliminations were due to responses which either did not refer to the questions at all, or statements expressing that the respondent was not yet involved in a project and thus, didn't answer the questions. Content-analysis and coding was done 'manually' with 'hands on' the text material. Structuring content-analysis (Patton, 1990) was used for categorization of the responses. This type of content-analysis is used whenever a theoretical pre-structuring is possible on which the coding scheme can be built.

The coding scheme was developed iteratively, its categories and subcategories were defined, operationalized and 'anchor examples' provided which are considered as typical for a category. Several community sites, online journals and discussion lists were consulted for completeness, clarity and further support of the categories. The final version of the coding scheme is presented in Appendix 1. The whole data set was coded independently by two coders. In addition, the expert coder was asked to code a subset of 100 responses in order to ensure that the 'real' meaning was captured in the results. Intercoder-reliability (Kassarjian, 1977; Kolbe and Burnett, 1991) ranged between 90.8% and 100%, 97% on average (across all categories) in the last, third round of independent coding. Remaining incongruence was discussed and solved within the coding team. According to the quality and amount of contributions of the subjects they were classified either as main contributors, contributors or affiliates. Two expert coders who are

familiar with several projects decided on the size and importance of a project or quality of contributions, respectively.

Tracing the process by which community members maintain community relationships and enhance productivity demands a different way of data analysis. Instead of structuring data according to content categories, the focus shifts to inter-individual and holistic interpretations of the text across all groups. This mode of analysis assumes that individual cases represent the instantation of macrolevel social processes and structures (Thompson and Haytko, 1997). Whereas content-analysis concentrates around single categories and concepts, extracting social processes specifically focuses on the relationships between them expressed by the 'lines of reasoning' of respondents. Additionally, on-line publications (firstmonday.dk), books, diaries of community members and project-related mission statements were consulted to gain more insight into the relevant concepts, culture and social dynamics of the community. Results and interpretation of the data are illustrated by verbatim accounts of the respondents.

EXCHANGE DYNAMICS OF AN INNOVATIVE VIRTUAL COMMUNITY

In this section the key elements and the meaning of exchange for different groups is described and its selfish and/or altruistic quality discussed. The social process of building and maintaining community relationships is presented in the second part of the results section.

> "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!" (contributor)

The extent of cooperation, productivity and quality of group outcomes is not only fascinating to community members themselves. "It is a truly amazing phenomenon." (contributor) and, so far, it is only partly understood. The respondents' answers underpin the importance of two main

motivational preconditions for voluntary engagement in collective on-line projects. One of them expresses the need for better software solutions, which ranks first of all motives reported, the other one interest and hedonic task-involvement or simply: having fun doing it.

> "The project I am involved with meets a need not addressed by proprietory systems in the same genre. I began working with it because it interested me and "scratched an itch" as ESR [*Eric S. Raymond*] put it." (contributor)
> "why do people play chess ? it's sort of the same, for the fun, the challenge….." (contributor)

It is "The thrill of the hack" (contributor), the fun and playfulness "…to tinker and play around with things" (contributor) which constitutes the main personal benefit and is decisive for individuals to start contributing to an on-line project. 'Insider' publications emphasize the importance of these self-centered motives for engagement (Raymond, 1999; Kuwabara, 2000) and at the same time support earlier findings in consumer behavior literature on enthusiastic consumer behavior. Highly involved or enthusiastic consumers not only engage in extended search and processing of information but also tend to become innovators in their field of interest (Bloch, 1986; Schouten and McAlexander, 1995). Notwithstanding the importance of direct product benefits and intrinsic motivation for getting in touch with the community, they nevertheless cannot explain cooperative behavior on the Internet. Besides necessary structural conditions, cooperation primarily depends on the specific contents and rules of exchange applied within a community.

Contents and meaning of exchange

Content analysis revealed five main categories or motives for voluntary engagement in a collaborative on-line project. Similar to previous findings in research on volunteering and pro-social behavior intrinsic and extrinsic self-centered motivations especially the joyful and challenging task performed and gaining knowledge are prevalent among respondents. Common

goals, communal relationships and rules and meaning of exchange agreed upon within the community determine the extent of contribution and how to cooperate.

Virtual communities have been said to gather around a common interest and shared passion (Kozinets, 1999). However, in a task-centered community common interest contends more than just shared personal interests. Group goals rather have an inter-individual character and reflect a common striving that transcends individual motivations. Kuwabara (2000), for instance, argued that individuals primarily cooperate because of group-efficacy rather than self-efficacy reasons. In simple terms this means that people cooperate because group goals and possible group outcomes exceed an individual's abilities whereas his/her own contributions, in concert with others, lead to the achievement of a much more attractive group goal, such as the "improvement of the software in the world" (contributor). By means of collaborating and experiencing group-efficacy individuals get a sense of contributing to a worthwhile cause.

> "I wanted to be part of the movement. The entire idea of cooperation and synergy (god help me, I used the s-word) is amazing. 1+1+1=4." (contributor)
> "There is also a bit of a feeling that I am making a contribution to something worthwhile, that I am "making a difference", even if its small." (contributor)

Mutually beneficial exchange relationships that are considered being worthwhile very much depend on the 'assets' a community is able to give away. As already pointed out, on-line communities develop an enormous knowledge pool in the area of interest. The global expert knowledge base is highly attractive, especially for enthusiastic programmers and early contributors. Intelligence and creativity are highly valued and respected and constitute important attractors for enthusiasts who want to become part of the community. This is not surprising considering the fact that in online communities people can only be valued for what they can communicate online – their digital products, expertise, thoughts and emotions.

> "Frequently the developers on open source are the crème de la crème: they're the ones who are so good at what they do that they have extra time and energy to devote to open source. They also tend to be more highly motivated, so they tend to have come farther and be more talented and interesting than the average engineer." (main contributor)
> "The user community surrounding it is also an intelligent and whimsical bunch, working on all sorts of interesting applications, so it's fun to hang out with them, even if it's only virtually." (contributor)

It is also the social interaction, the friendship offered and given, that fosters individual cooperative behavior. Core members and experts are not (solely) admired, but equally involved in day-to-day interaction and tasks. It is the 'content' rather than a person or a name that counts in a virtual environment. And it is not the kind but the quality of a contribution that is valued, although contributing high quality code probably enhances self-esteem the most.

> "A lot of necessary and unglamorous work keeps it going-…… People who do this sort of thing well get a lot of respect, because everybody knows these jobs are huge time sinks and not as much fun as playing with code. Doing them shows dedication." (Raymond, 1999, p.244)

According to the theoretical discussion whether contributors primarily apply a direct or generalized reciprocal 'model' of exchange, or if cooperation may best be explained by altruistic behavior, respondents statements have been carefully investigated for the norms and rules implied. Responses were categorized as expected reciprocity, moral obligation, equity ('giving back') or altruism ('helping behavior'). Expectations of reciprocations were moderate in terms of number of responses and exclusively found in the contributor group.

> "I've observed to a large extent, "what goes around comes around", and if I contribute, people are willing to help me in return." (contributor)

Moral obligation as a reason for returning something back to the community occurred very rarely. When reported, feelings of indebtedness were always related to the amount or

significance of what individuals have ‘gained’ from the community. Thus, whether individuals feel obligated to return depends on the amount of personal gain.

> “I got involved with hacking on perl and with documenting perl because I feel an enormous debt of gratitude to the open source community. I think that it is only fair to give something back to the community that has given so much to me.” (contributor).
> “I use free software almost exclusively and feel obligated to return what I can.” (contributor)

The vast majority of answers referred to the equity principle of reciprocation as well as to the wish to help others. Although seemingly different constructs, respondents very often mention both, the wish to give back *and* help others. In people's minds there exists no incongruence between helping behavior and the rule of equity. In general, pure gift giving is exceptional. However, community members give and help because they have been helped or because they know that there will be some return in the future. Returning the favor to the community is the strongest social norm especially within the big group of contributors, and keeps the generalized exchange system in balance. Answers reflect an attitude of fairness, ‘balancing the sheet’ and applying the social norms observed, rather than injunctive norms of what they *should* do in the sense of moral obligation.

> “I felt it only fair to give back to the community.” (contributor)
> “After all, others have done that for me before, so returning the favor is the geek thing to do!” (contributor)

Even more respondents, especially in the main contributors group state that they want or like to help others. The culture of the core developers group seems to be slightly different from the rest of the community. Despite of the fact that they constitute the expert group and, thus, are the main 'givers' by definition, they nevertheless refrain from exerting their expert power. Instead, their ideological background and attitude is more altruistic, they like giving gifts.

> “First, I like to help people. When someone would be better off with an application that doesn’t exist yet, or a new feature added to an existing application, it is my pleasure to

> implement it for their use. It's no different from helping someone move a piece of furniture from one room to the other – they need a hand , so I provide one." (main contributor)

The social reward is huge. Friendship, peer reputation and positive reactions from users all over the world. It is these social rewards combined with autonomy and a liberal and humanistic culture that supports cooperation and is part of the self-sustaining system of exchange as will be described below.

The process of exchange and gift-giving – the power of empowerment

When looking at the data from a different perspective and adopting a process view the data reveal that the motivational background of the members of the open-source community concentrates around central themes. Motivations tend to center around being free to do what oneself and/or the community considers as being right and fun, around possibilities of personal development and expertise, getting help and giving it back, humanism, and valued relationships. This is addressed at the concrete level of how individuals perform their task as well as at the abstract value level. In the 1980s, Lawler (1986) and his colleagues began using the term "high-involvement" management, founded on the idea that employees could be trusted to make decisions about their work, that they could acquire the knowledge to do so, and that organizations would function more effectively if they did. They identified four components of high involvement: sharing information, developing knowledge on their own, rewarding performance, and distributing power. In the late 1980s the term empowerment came into existence based on this work. Empowerment implies the freedom and ability to make decisions and commitments, not only to suggest them or be part of making them. The meaning of this concept lies in the core of the word. Empowerment is about power and enhancing it (Forrester, 2000). Compared to the writings of the members of the open-source community this concept seems even underestimating

the opportunities of a successful virtual community. One reason behind this is the very nature of the Internet itself. Exchanging information and developing knowledge happens on the Internet in a rapid manner and the sum of knowledge developed in on-line communities is enormous. If brain power represents the main resource for innovation, power to a good extent depends on competence and expertise. The open-source community provides a perfect example of how to develop and sustain this resource and, by doing so, empowers its members.

The process would not start off without an idea and product that concentrates enough interest of users and experts and provides a fertile ground for fascinating creative individuals. People have to have the expertise or the opportunity to accomplish the knowledge and skills necessary to be able to contribute. However, contributing is only feasible when ideas and products are not hoarded but made fully available to the wider public. In the case of digital goods publishing them on the Internet is a relatively inexpensive and easy task. But how does a virtual community enhance and sustain knowledge as its most important resource?

The Internet offers several technical facilities to provide information as well as platforms for discussion and direct contact with community members worldwide. Mailing lists, discussion groups, on-line chatrooms, e-mail, answers to FAQ's (frequently asked questions) on project-related websites and on-line books, articles, HOWTO's and - most importantly – the commented source codes offer infinite learning opportunities. However, the learning effort of even the most ambitious individual will decrease rapidly when challenge lies high above individual skills. Above this critical threshold outside help from more sophisticated community members is needed and regularly provided. "there is plenty of helpful people out there" (contributor). Moreover, the modular structure of open-source software enables iterative learning processes on small and self-selected tasks (O'Reilly, 1999). At the same time it makes providing help an easy task as problems are better defined and easier to detect. Frequently occurring problems and related

questions are answered in FAQ's which makes 'teaching' extremely efficient. Task-involvement and the learning progress provide a self-sustaining motivational system and often lead to remarkable careers. During this learning process constant interaction with others also strengthens social ties and even leads to close friendships. Giving back and contributing to the community then becomes "the natural thing to do". Here is the story of a community member that describes this process:

> "i discovered linux almost 5 years ago. at the time i was working for $7 dollars an hour as a cashier at a pizza shop. after doing hobbyist hacking for a year i began to study the true art of computer programming. ……. i stayed up all night long hacking on an increasingly frequent basis. i finally missed too much work (too sleepy to go in :-) and was fired by the pizza shop manager. fortunately, my friends and colleagues in the open source community had taught me enough that i was employable as a junior engineer - even without a formal degree or any formal training. now i make well past $100,000US each year. …. i credit all of this to the generosity of the open source community. quite literally, without open source software, my life would be nothing like this." (extreme example, contributor)

Quite obviously, not every contributor has the spare time or capability of achieving a high level of expertise. Challenges may well be above the threshold of individuals. However, there is plenty of room for other types of contributions encouraged by the community. Whoever wants to get involved in a project and wants to give back can find an appropriate level of challenge, for instance by fixing or just reporting bugs, writing HOWTO's or maintaining a mailing list.

> "I haven't been integrally involved, but I enjoy being able to give my input and ideas. If what I thought has merit, I can see the results come to fruition and perhaps make friends along the way. It's not often in this world that you actually get to make a difference, and open-source projects are widely used an trusted, so each little bit of input gets used, gets used by a lot of people. It's a good feeling." (affiliate)

The concept of group-efficacy as a source of motivation is important here. Individual contributions are rewarded by reactions ('kudos and comments') of community members who appreciate the job done. With every piece of work submitted feed-back is provided within hours

or even minutes (Lakhani and von Hippel, 2000). Due to the high number of experts worldwide working on OS-projects peer review reflects also a clear feed-back concerning the quality of the contribution. Only the best code goes into a new release. This fact would represent a serious obstacle for non-sophisticated coders who want to contribute. This obstacle is overcome by releasing the source code and let others improve on it, as well as the learning opportunities that result from these improvements. If the code is integrated in a new release, reputation and feed-back from peers and users enhance further contribution.

> "I made it free software because I wanted other people to benefit from my work. Also, it is exciting and gratifying to have thousands of people using what I wrote, and sending comments on it, suggestions, etcetera." (contributor)
> "the fame and glory that comes with having created a program that millions of people use." (main contributor)

The 'reputation game' (Raymond, 1999) plays a decisive role as a source of motivation. An even more powerful motivator is provided by the response of hundreds, thousands or 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. It has been argued before that volunteerism, or being of service to others, appeals to the esteem need of volunteers (Mesch et al., 1998). However, the extent to which esteem needs are possibly met via responses on the Internet is unprecedented. Considering this, it becomes clear why the problem of free-riding turns out to be completely irrelevant in that context. On the contrary; the more people all over the world who use and appreciate the outcomes of the collective effort, the more the contributors feel empowered, and their efforts become worthwhile.

> "This is the fulfillment of the promise of "the age of aquarius" (yes I remember those days, I was there)." (main contributor, extreme example)

The processes described function as self-sustaining mechanism and ensure a steady flow of resources and productivity. The basic dimensions and mechanisms at work can be summarized as empowerment by: (1) the modular character and flexibility of products and tasks, (2) the specific rules of exchange and gift-giving, (3) communal ties and friendship, (4) the underlying belief system, and (5) the enhancement of self-worth.

Community members not only exchange information and products of high economic short- and long-term value, but also of high psychological and social value. A community feeling and group attachment evolve out of a feeling of thankfulness and because people know that they are helped and favors are returned. Exchange processes are not limited to contributors or to an inner circle but equally apply to the big affiliate network. This creates and distributes knowledge and improves skills at different levels – from simple usage to highly sophisticated coding skills. As a result individuals gain more perceived control over product usage and tasks, resulting in a higher degree of independence and autonomy. The modular structure of products and the high degree of flexibility in product usage and task definition also increase perceived control. Furthermore, individual careers are fostered and the worldwide knowledge base increases rapidly. The community's belief system provides an important anchor at the value-level and hence, helps stabilizing the system of exchange. Individual self-worth increases empowered by self-determination, development of personal knowledge and improved future perspectives.

DISCUSSION

This exploratory research has shown that, under the existing structural conditions and technological tools offered by the Internet, expert and enthusiastic consumers gain valuable economic, psychological and social 'assets' by jointly producing digital goods for their own needs and those of others. Contrary to the assumption that individuals are compelled to participate in an

exchange relationship in order to satisfy their needs, the free offer of collaborative work on the Internet does not enforce any participation but rather makes contributing back a voluntary option. The free-riding option asks for a more differentiated explanation of how such systems of exchange on the Internet are kept in balance and how cooperative behavior is encouraged.

Several key elements of exchange are decisive for creative on-line communities to exist and survive. Firstly, exchange is based on the economic value of the digital goods produced and given away. Cultural convictions in capitalist economies may lead to feelings of moral obligation to give something in return. However, usage of free software far outweighs the number of contributions. Secondly, and decisive for exchange to occur is a community's knowledge base and expertise. The community's power of innovativeness results from accumulating member-generated expertise and multiplying it by giving it away. They built up a self-sustaining educational system with expert teachers and their highly motivated scholars who become experts and again, help the more inexperienced. Knowledge is an on-line community's most valuable resource, giving it away and giving back the main principle of exchange which multiplies these resources. However, individuals' 'exchange models in mind' differ in its underlying principles of exchange. More altruistic attitudes correlate with the amount of contributions which is a common finding in research on volunteerism (Thompson and Bono, 1993). However, contrary to previous findings in volunteerism contribution in task-centered virtual communities is rarely based on moral obligation. Instead, in this research many respondents mention both concepts, giving back as well as helping others, as motivational basis for contributing and combine equity rules with altruistic behavior. Single theoretical concepts, therefore, do not provide full explanation of exchange processes on the Internet.

Thirdly, contribution behavior is highly rewarded with social approval. Feelings of belonging and friendship and peer reputation are internal sources of social reward. Positive feed-

back and reactions from users all over the world provide external rewards which enhance feelings of self-worth and confirm the community's ability to alter the state of the world. It is this quality that makes creative on-line communities powerful and gives them the character of a social movement that was even able to change the way of doing business in specific industries.

In view of these developments, a company's role should no longer be limited to providing products and services. Success – under these circumstances - rather becomes a question of designing a system of inherently joyful and challenging activities and tasks within which consumers can create their own value embedded in a common purpose. Companies will have to provide Know-How and develop the knowledge necessary for consumers to become innovative. This demands the establishment of a community owned environment where knowledge creation, social interaction and cooperation can take place. However, creating knowledge and encourage contributions requires organizational structures that go beyond technology. Sharing, voluntary exchange and helping can only prosper within a culture of openness. The currencies for exchange are products, knowledge and reputation, rather than money and career concerns. These are important prerequisites in order to establish trusting relationships with creative expert consumers.

Productive communities will always be dependent on creative and ambitious individuals. It would be naïve to assume that this model could be applied to any kind of collaborative effort. However, if we adopt the humanist view that human beings, under appropriate circumstances, are motivated to explore and manipulate their environment in ways which are essentially creative (West and Altink, 1996) we may conclude that, given a common interest, these insights can be generalized to every innovative, creative and social effort of expert consumers in the 'virtual' world.

References

Anderson, Wilton Th., Challagalla, Goutam N. and Richard G. McFarland (1999). "Anatomy of Exchange*," Journal of Marketing Theory and Practice* (Fall), 8-19.

Antaki, Charles (1988). "Structures of Belief and Justification," in: Antaki, Charles (ed*.), Analysing Everyday Explanation – A Casebook of Methods*, London: Sage Publications, 61-73.

Armstrong, A. and J. Hagel III (1996). "The real value of on-line communities," *Harvard Business Review*, (May-June), 134-141.

Bagozzi, Richard P. (1974), "Marketing as an Organized Behavioral System of Exchange", *Journal of Marketing*, Vol.38 (October), 77-81.

Bagozzi, Richard P. (1975), "Marketing as Exchange", *Journal of Marketing*, Vol.39 (October), 32-39.

Bandura, Albert (ed.) (1995). *Self-Efficacy in Changing Societies*, Cambridge: Cambridge University Press.

Belk, Russel W. and Gregory S. Coon (1993). "Gift-Giving as Agapic Love: An Alternative to the Exchange Paradigm Based on Dating Experiences," *Journal of Consumer Behavior*, Vol.20 (December), 393-417.

Bettencourt, Lance A. (1997). "Customer Voluntary Performance: Customers as Partners in Service Delivery," *Journal of Retailing*, Vol.73, No.3 (Fall), 383-408.

Blau, Peter M. (1964). *Exchange and Power in Social Life*, New York: John Wiley & Sons Inc.

Bloch, Peter H (1986). "The Product Enthusiast: Implications for Marketing Strategy," *The Journal of Consumer Marketing*, Vol.3 (Summer), 51-63.

Bollier, David (1999). "The Power of Openness," working paper, Berkman Center for Internet and Society, http://eon.law.harvard.edu/opencode/h20/, 1-27. accessed december 7th, 2000.

Cialdini, Robert B, Reno, Raymond R. and Carl A. Kallgren (1990). "A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places,"*Journal of Personality and Social Psychology*, Vol.58, 1015-1026.

Cialdini, Robert B., Kallgren, Carl A. and Raymond R. Reno (1991). "A Focus Theory of Normative Conduct: A Theoretical Refinement and Reevaluation of the Role of Norms in Human Behavior" in: Leonard Berkowitz (ed.) *Advances in Experimental Social Psychology*, Vol.24, 201-214.

Csikszentmihalyi, Mihaly (1997). *Creativity: Flow and the Psychology of Discovery and Invention*, New York: HarperPerennial.

Csikszentmihalyi, Mihaly (2000). "The Costs and Benefits of Consuming," *Journal of Consumer Research*, Vol.27 (September), 267-272.

Deutsch, Morton (1985). *Distributive Justice: A Social-Psychological Perspective*, New Haven, CT: Yale University Press.

Diekmann, Andreas (1985). "Volunteer's Dilemma," *Journal of Conflict Resolution*, Vol.29, 605-610.

Diekmann, Andreas (1986). "Volunteer's Dilemma: A social trap without a dominant strategy and some empirical results," in: A. Diekmann and P. Mitter (eds.). *Paradoxical Effects of Social Behavior: Essays in Honor of Anatol Rapaport*, Heidelberg: Physica-Verlag, 97-103.

Durkheim, Emile (1973). *De la division du travail social*, Paris: Presses universitaires de France.

Ekeh, Peter P. (1974). *Social Exchange Theory: The Two Traditions*, Cambridge, MA: Harvard University Press.

Etzioni, Amitai (1975). *Comparative Analysis of Complex Organizations* (enlarged ed.), New York: MacMillan Publishing Co.

Fernando, Jude L. and Alan W. Heston (eds.) (1997). *The Role of NGOs: Charity and Empowerment*, The Annals of the American Academy of Political and Social Science, November, Thousand Oaks, CA: Sage Publications.

Fernback, Jan (1999). "There Is a There There. Notes Toward a Definition of Cybercommunity," in: Steve Jones (ed.). *Doing Internet Research. Critical Issues and Methods for Examining the Net*, Thousand Oaks, CA: Sage Publications.

Firat, A. Fuat and Alladi Venkatesh (1995). "Liberatory Postmodernism and the Reenchantment of Consumption," *Journal of Consumer Research*, Vol. 22 (December), 239-267.

Fisher, Robert J. (1993). "Socially Desirable Responding and The Validity of Indirect Questioning," *Journal of Consumer Research*, Vol.20 (September), 303-315.

Fisher, Robert J. and David Ackerman (1998). "The Effects of Recognition and Group Need on Volunteering: A Social Norm Perspective," *Journal of Consumer Research*, Vol.25 (December), 262-275.

Foa, Edna B. and Uriel G. Foa (1980). "Resource Theory: Interpersonal Behavior as Exchange," in: *Social Exchange: Advances in Theory and Research*, K. J. Gergen, M. S. Greenberg, and R. H. Willis (eds.) New York: Plenum Press.

Forrester, Russ (2000). "Empowerment: Rejuvenating a potent idea," *Academy of Management Executive*, Vol.14, No.3, 67-80.

Grönroos, Christian (1999). "Relationship Marketing: Challenges for the Oganization," *Journal of Business Research*, Vol.46, 327-335.

Gummesson, Evert (1998). Implementation Requires a Relationship Marketing Paradigm, *Journal of the Academy of Marketing Science*, Vol.26, No.3, 242-249.

Haas, David F. and Forrest A. Deseran (1981). "Trust and Symbolic Exchange," *Social Psychology Quarterly*, Vol.44 (March), 3-13.

Hirschman, Elizabeth C. (1987). "People as Products: Analysis of a Complex Marketing Exchange," *Journal of Marketing*, Vol.51 (January), 98-108.

Holbrook, Morris, B. (1994). The Nature of Customer Value, in: Roland T. Rust and Richard L. Oliver (eds.), *Service Quality: new directions in theory and practice*, Thousand Oaks, CA: Sage Publications, 21-71.

Holt, Douglas B. (1995). "How Consumers Consume: A Typology of Consumption Practices," *Journal of Consumer Research*, Vol. 22, June, 1-16.

Kabanoff, Boris (1991). "Equity, Equality, Power, and Conflict," *Academy of Management Review*, Vol.16, No.2, 416-441.

Kassarjian, Harold H. (1977). "Content Analysis in Consumer Research," *Journal of Consumer Research*, Vol. 4 (June), 8-18.

Kelley, Scott W., James H. Donnelly, Jr., and Steven J. Skinner (1990). "Customer Participation in Service Production and Delivery," *Journal of Retailing*, Vol.66 (Fall), 315-335.

Kelley, Scott W., Steven J. Skinner and James H. Donnelly, Jr. (1992). "Organizational Socialization of Service Customers," *Journal of Business Research*, Vol.25 (November), 197-214.

Kolbe, Richard H. and Melissa S. Burnett (1991). "Content-Analysis Research: An Examination of Applications with Directives for Improving Research Reliability and Objectivity," *Journal of Consumer Research*, Vol.18 (September), 243-250.

Kollock, Peter and Marc A. Smith (1998). *Communities in Cyberspace*, London: Routledge.

Kotler, Philip J. (1997). *Marketing Management Analysis, Planning , and Control*, 9th ed., Englewood Cliffs, NJ: Prentice Hall Inc.

Kozinets, Robert V. (1999). "E-Tribalized Marketing?: The Strategic Implications of Virtual Communities on Consumption," *European Management Journal*, Vol.17, No.3 (June), 252-264.

Kuwabara, Ko (2000). "Linux: A Bazaar at the Edge of Chaos," *firstmonday*, Vol. 5, Nr. 3 (March), http:/www.firstmonday.dk/issues/issue5_3/kuwabara/index.html, 1-61.

Lakhani, Karim and Eric von Hippel (2000). "How Open Source software works: "Free" user-to-user assistance," MIT Sloan School of Management Working Paper#4117, 1-39.

Lawler, Edward. E. (1986). *High involvement management*, San Francisco: Jossey-Bass.

Lerner, Josh and Jean Tirole (2000). "The Simple Economics of Open Source," Working Paper (February) http://www.hbs.edu/dor/papers2/9900/00-059.pdf, 1-39.

March, James G. and Herbert A. Simon (1958). *Organizations*, New York: Wiley.

Marwell, Oliver (1982). "Altruism and the Problem of Collective Action," in: Valerian J. Derlega and Janusz Grzelak (eds.), *Cooperation and Helping Behavior*, New York: Academic Press, 207-226.

Mauss, Marcel, Ian Cunnison and Edward E. Evans-Pritchard (1970). *The gift: forms and functions of exchange in archaic societies*, London: Routledge & Kegan Paul.

Mesch, Debra J., Mary Tschirhart, James L. Perry and Geunjoo Lee (1998). „Altruists or Egoists? Retention in Stipended Service," *Nonprofit Management & Leadership*, Vol.9, No.1 (Fall), 3-21.

Morgan, Robert M. and Shelby D. Hunt (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, Vol.58, July, 20-38.

Murninghan, J. Keith, Jae Wook Kim and A. Richard Metzger (1993). "The Volunteer Dilemma," *Administrative Science Quarterly*, Vol.38, 515-538.

Olsen, Marvin E. (1978). *The Process of Social Organization – Power in Social Systems*, US: Holt, Rinehart and Winston, 2nd ed.

Olson, Mancur (1965). *The Logic of Collective Action*, Cambridge, MA: Harvard University Press.

O'Reilly & Associates (1999). *Open Source*, Koeln: O'Reilly & Associates.

Patton, Michael Q. (1990). *Qualitative Evaluation and Research Methods*, 2nd ed., Newbury Park, CA: Sage Publications

Raymond, Eric S. (1999). *The Cathedral and the Bazaar. Musings on Linux and Open Source by an Accidental Revolutionary*, O'Reilly & Associates, Sebastopol, CA.

Rheingold, Howard (2000). *The Virtual Community: Homesteading on the Electronic Frontier*, revised edition, Cambridge, MA: The MIT Press.

Schneider, Benjamin and David E. Bowen (1995). *Winning the Service Game*, Boston, MA: Harvard Business School Press.

Schouten, John W. and James H. McAlexander (1995). "Subcultures of Consumption: An Ethnography of the New Bikers," *Journal of Consumer Research*, Vol.22 (June), 43-61.

Stirrat, R. L. and H. Henkel (1997). "The Development Gift: The Problem of Reciprocity in the NGO World," in: Jude L. Fernando and Alan W. Heston (eds.), *The Role of NGOs: Charity and Empowerment*, The Annals of the American Academy of Political and Social Science, November, 1997, Thousand Oaks, CA: Sage Publications, 66-80.

Thompson, Alexander M. and Barbara A. Bono (1993). "Work Without Wages: The Motivation of Volunteer Firefighters," *American Journal of Economics and Sociology*, Vol.52, No.3, 323-343.

Thompson, Craig J. and Diana L. Haytko (1997). "Speaking of Fashion: Consumers' Uses of Fashion Discourses and the Appropriation of Countervailing Cultural Meanings," *Journal of Consumer Research*, Vol.24 (June), 15-42.

Tzokas, Nikolaos and Michael Saren (1997). Building Relationship Platforms in Consumer Markets: A Value Chain Approach, Journal of Strategic Marketing, Vol.5, No.2, 105-120.

van Oorschot, Wim (1999). "The Legitimacy of Welfare: A Sociological Analysis of Motives for Contributing to Welfare Schemes." Working Paper for De Toekomst Van De Sociale Zekerheid, Universiteit Antwerpen, December, 1-24.

van Rossum, Guido (1999). "Interview with van Rossum," in: O'Reilly & Associates (1999). *Open Source*, Koeln: O'Reilly & Associates, 45-48.

von Hippel, Eric (1988). *Sources of Innovation*, New York: Oxford University Press.

von Hippel, Eric (1998). "Economics of Product Development by Users: The Impact of "Sticky" Local Information," *Management Science*, Vol.40, No.4 (April), 429-439.

Walster, Elaine, G., William Walster, Ellen Berscheid and William Austin (1978). *Equity: theory and research*, Boston, Mass.: Allyn and Bacon.

West, Michael A. and Wieby M.M. Altink (1996). "Innovation at Work: Individual, Group, Organizational, and Socio-historical Perspectives," *European Journal of Work and Organizational Psychology*, Vol. 5, No. 1, 3-11.

Wikström, Solveig (1996). "Value Creation by Company-Consumer Interaction," *Journal of Marketing Manag*ement, Vol.12, 359-374.