ORIGINAL PAPER

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The nature of virtual communities

Abstract The impressive development of electronic communication techniques has given rise to virtual communities. The nature of these computer-mediated communities has been the subject of much recent debate. Are they ordinary social groups in electronic form, or are they fundamentally different from traditional communities? Understanding virtual communities seems a prerequisite for the design of better communication systems. To clarify this debate, we will resort to the classical sociological distinction between small traditional communities (based on personal relations) and modern social groups (bound by looser, more impersonal links). We will argue that the discussion about virtual communities is often vitiated by a simplistic assimilation to traditional communities, whereas they may be in fact quite different and much more impersonal. Virtual communities are often bound by reference to common objects or goals, and not by personal relations. In this respect, virtual communities are just another example of a long-term evolution of modern society toward more abstract social relationships.

Keywords Virtual communities · Community · Gemeinschaft · Gesellschaft · Cyberspace · Groupware · Collaborative software · Social networks.

1 Introduction

The impressive development of electronic communication techniques in the past twenty years has totally changed the overall picture of social communication methods. E-mail, instant messaging or chat, forums and newsgroups, discussion lists, co-ordination by means of Web pages and other computer-mediated communication methods on the Internet have greatly accelerated the speed, size and ease of human communication. Internet is beyond doubt a major phenomenon of our time.

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One may ask whether the telephone should be included among electronic communication techniques. Technically, yes, but telephones have been around for a much longer time and do not constitute a new phenomenon (in spite of the recent spread of cell phones). And telephone communication is spoken, mostly one-to-one, with frequent emotional overtones, so that it probably belongs to a category in itself, to be differentiated from other recent techniques.

Because communication is one of the foundations of social groups (social cohesion requires communication of some sort between group members), the development of new communication techniques is apt to cause social changes. These new electronic techniques have thus given rise to new social groups, which now usually go by the name of *virtual communities*.

The expression itself deserves some preliminary comment. Those communities are presumably called *virtual* because they function without actual physical contact, in "cyberspace" (Kollock and Smith 1999). But is this really a crucial defining characteristic? Some traditional communities (e.g. ethnic or religious communities) do not necessarily imply physical contact between all group members but may be defined by common experience, awareness, beliefs or values. So let us say *virtual communities* has now become a set phrase referring to computer-mediated communities, and let's leave it at that for the time being.

The central question is probably the following: are virtual communities simply an extension of classical social groups (in electronic clothing so to speak), or are they a fundamentally new type of social grouping? The data so far is ambiguous enough to accommodate both points of view and the issue requires careful scrutiny. The issue is important because the exact nature of virtual groups is probably relevant to the design of good communicative or collaborative software. To better accommodate these new communities, we must first try to undersand how they function.

In the literature on virtual communities one can notice a marked tendency to equate them with communities of the most traditional kind, imbued with positive moral values. However, when the actual functioning of virtual communities is examined more closely, it is far from evident that they really conform to the traditional kind of social groups based on close personal relations between group members.

On the contrary, we will argue here that it is generally a mistake to equate virtual communities with traditional communities, because computer-mediated groups actually show novel characteristics and tend toward looser, more impersonal forms of interaction. The familiar image of traditional communities thus obscures the reality of the new electronic groupings, which requires a fresh approach to the subject.

As a matter of fact, there has been a long-term evolution at play in modern society toward more impersonal, functional social relations. In this respect, the recent development of impersonal electronic forms of communication is in perfect agreement with a general tendency of our society, which brings about more and more abstract social links. The question now becomes: how can we make sure that these new associations do function in a coherent way?

After this introduction, we will first describe the main types of social communities in Sect. 2. In Sect. 3, we will emphasize recent social trends. Virtual communities will then be analyzed more closely in Sect. 4. Finally, the diversity of social groups will be discussed in Sect. 5, before reaching a conclusion.

2 Types of communities

Before examining virtual communities in more detail, it would be relevant to analyze the very concept of social community. This is of course a central theme in sociology, and the issue has been discussed at length ever since the birth of this discipline in the nineteenth century. There is now a received set of concepts and distinctions on this subject.

2.1 The notion of community

We would like first to try to describe a frequent usage of the term *community* in everyday language. This common-sense notion implicitly permeates the debate about virtual communities, although it may not be really adequate. Analyzing this notion would clarify the issues and help improve the pertinence of the debate.

Though usage varies somewhat, it appears that in the most usual sense, a *community* refers to a particular kind of social group, defined by strong personal links. Such a group will be fairly small, so that it is possible for each member to know personally everybody else in the group. Relations are supposed to be direct, face-to-face, frequent and stable. Relations are strongly tinged with affectivity, which is often presented in a positive light. In a rosy version of the picture, relations are warm, cordial, well-meaning and kind. Everybody can count on the sympathy and solidarity of other group members in case of need or mishap.

Although we all know that real human relations are much more ambivalent, and that power struggles and village feuds are probably just as common as group solidarity, this ideal world is felt to be secure, reassuring, comforting. Everybody knows their place in a global relational network, and everybody is recognized personally by everybody else.

This type of community is often described with warmth and emotion in the mass media, such as television and the movies. This is a cliché which recurs regularly in television fictions set in the countryside or in small towns. Such an image obviously enjoys wide popular appeal.

Yet it does not take much thought to realize that this is all largely a myth by now (though a very common and powerful myth). It might be the case that such communities could still be found in Amazonian tribes or in remote villages of India, but they simply do not exist any longer in modern countries. When such communities do occur in our society, they are unstable, fragile and usually temporary.

There is then a strong flavor of nostalgia about this idealized picture of a community. The emotional appeal of traditional communities tends to blind people to the reality of social groups they are likely to encounter in modern life. Computer-mediated groups are inevitably confronted with this ideal picture, making it difficult to analyze their real functioning.

2.2 A classical distinction

Sociology has fortunately elaborated finer and more realistic descriptions of social groups for more than a century now. The general view is that modern

societies tend toward more and more abstract social groupings, away from the personal links of traditional communities.

German sociologists such as Tönnies, Simmel, and Weber have proposed a fundamental distinction between traditional community (*Gemeinschaft* in German) and modern society (German *Gesellschaft*). Tönnies was probably the first to formulate it clearly at the end of the nineteenth century, but Weber is the most often quoted when this distinction is mentioned; Simmel also illustrated it repeatedly in his analyses of modern urban life (Tönnies 1963; Weber 1956; Simmel 1989).

The older *Gemeinschaft*-type community is based on strong personal links within small, fairly stable social groups (e.g. a tribe or a small village). This is close to the common-sense notion of community we have outlined above, but the sociological concept is more complex and less romantic. The life of such a group is usually associated with a limited territory and the group is structured by direct person-to-person relations and obligations. These relations are inflexible, and group pressure to conform is heavy and inescapable. Group identity is therefore obvious and strong.

One may see *Gemeinschaft*-type communities as psychologically reassuring, but they are also closed, oppressive, unchanging societies, where nobody can escape their allotted place.

On the contrary, in modern *Gesellschaft*-type society, links are much more impersonal, temporary and functional (as is typical in city life). In larger modern associations, function and social roles replace personal relations as the basis of social status. The increasing size of these organizations makes it impossible anyway to know all other group members on a personal basis, and social functioning is guided by rules, regulations and contracts, rather than by traditional custom and personal obligations. Individual members may well belong to several groups and group identity is much weaker.

Modern society is obviously much freer and more flexible, at the cost of increased loneliness, fragility of social structure, and potential psychological insecurity.

One can find a similar distinction in Durkheim: the difference between *mechanical* solidarity and *organic* solidarity (Durkheim 1960). The former is characteristic of traditional groups in primitive societies, whose members are poorly differentiated and strongly linked. But the "organic" solidarity of modern society is looser and more abstract. It is based on the complementarity of different social roles due to the increasing division of labor in modern economies, which has made personal bonds obsolete.

A more recent, but very similar distinction has been put forward by Granovetter: the difference between *strong ties* and *weak ties* (Granovetter 1973). Strong ties involve frequent contacts, emotional intensity and solidarity. They tend to form densely linked groups, such as family and friends. On the contrary weak ties are casual, superficial and do not form communities, but are nonetheless very important for the circulation of new information.

Whatever the names used, there has been a clear evolution from the former toward the latter form of association throughout the last century. There is a general trade-off between security and freedom, and social evolution has gradually favored mobility over belonging. As a matter of fact, traditional communities have by and large disappeared in developed countries, even if there is

still widespread nostalgia for older times. Industrial and bureaucratic societies have replaced personal links with contractual relations.

Similarly, the rise of the merchant economy, with its finely differentiated products which require the use of money for their allocation, has gradually replaced many personal relations with monetary transactions. Simmel has analyzed in great detail the corrosive effect of money on traditional relationships and their replacement in modern society by more abstract links.

This general evolution is a fundamental fact of recent social history, due to a powerful conjunction of factors: cultural (the rise of individualism), economic (the increasing division of labor), technical (the development of modern transportation and communication methods). The trend is therefore massive and inescapable, and it would be naive to ignore this historical background when discussing modern social groups.

3 Recent social evolution

One can also observe a marked acceleration in the past twenty years of this long-term trend toward more flexible associations and network organizations (Castells 1996; Shapiro and Varian 1999). This is clearly correlated with the development of electronic communication techniques in the same period (although it seems that recent organizational changes have preceded by a few years the increased availability of modern telecommunications).

From a sociological point of view, flexible group membership is becoming more and more common. A typical modern behavior has emerged, where group membership is constantly re-evaluated and renegotiated. The modern individual belongs to several groups (professional, cultural, political...) at the same time but doesn't identify too closely with any of them. He or she views the association with any given group as potentially temporary, to be discarded without trepidation when circumstances have changed.

This type of person switches with ease between different social circles as his interests evolve or new opportunities arise, and doesn't burden himself with an obsolete identity. He is quite ready to renegotiate his status and membership to improve his situation, and carefully maintains a large social network in order to facilitate such changes.

One may witness in our time the emergence of a typical personality: affable, easy-going, pleasant and flexible. But this is often a superficial personality, cold and shallow behind the surface geniality. Such an individual is actually self-centered and calculating, ready to ditch obsolete causes in favor of newer, more profitable interests. His social engagements are usually loose, temporary and unemotional. This profile is more prevalent in the urban upper-class, but it somehow sets the tone for the whole society.

This personality type enjoys a relatively high degree of freedom, as he may surf from one social group to the next according to his plans. But he has lost the psychological comfort and emotional wealth of a unique identity, and it takes some fortitude or experience to deal with ever-changing circumstances.

A similar evolution is also evident in recent management fashions and practices (Veltz 2000). Various phenomena all point in the same direction: goal-oriented management, the emphasis on flexibility and autonomy, temporary

work-teams, subcontracting and outsourcing, hollow firms... These are but different manifestations of an organizational structure where group membership has become temporary, groups are frequently reorganized, and flat networks have become the dominant structural paradigm.

These organizational changes have in turn been triggered or fostered by an economic evolution giving more and more weight to innovation and differentiation, product quality, adaptability to the market, lean production... There is an obvious parallelism between the social evolution toward looser associations and these recent economic and managerial changes. One may speculate as to which is cause or effect, but they are probably all entangled together, reinforcing each other.

This general evolution may also be observed in non-profit organizations, which are presumably less influenced by managerial discourse. Within a time-span of thirty years, the stereotypical militant, with his one-track mind, dogmatical discourse and intolerance to dissent, has given way to much more flexible and diversified behavior. Today's association members often belong to several associations and move freely between different associations. Their interests and ideology are more varied and there is much more tolerance for individual opinions. Many associations have accordingly evolved toward a network structure.

Anti-globalization movements for example are much more loosely structured than traditional unions or parties used to be. There is now a marked distrust of rigid hierarchical structures, and various groups and subgroups within the global movement are deliberately organized as flexible networks, bound together by modern communication techniques such as the Internet.

4 Computer-mediated communities

Given this description of the global sociological background of modern communication techniques, it is now time to examine more closely the actual functioning of virtual communities. Opinions vary as to the proper way to describe these communities, and a fresh view would be useful.

4.1 A common approach

When one begins to survey the literature about virtual communities, it is striking to see how frequently electronic groups are described as if they were *Gemeinschaft*-type communities, with strong personal relations between members. Pioneers and practitioners of early versions of forums, chats and similar computer-mediated communications systems insist that such systems are apt to give rise to real communities with rich human relationships, which are otherwise too often lacking in today's society (Rheingold 2000; Wellman 1999).

There is obviously an element of idealism or nostalgia in many of those high-tech experiences. Rebuilding or fostering meaningful human relationships appears to be a strong motivation among the early proponents of electronic communication systems. Though the evidence cited is usually anecdotal, we believe the use of some systems did in fact help create or maintain social groups with strong interactions and real personal contacts.

We doubt, however, that this picture would be generally valid. Some specific conditions seem necessary for electronic systems to give rise to tightly-linked communities: the number of members should be small (let's say, less than a hundred members), they should come from a similar socio-economic background, share similar interests, and spend sufficient time together on the network. Open, casual participation doesn't fit the picture.

This communal approach has also been the inspiration for a more formal and systematic research domain: collaborative software systems known as *groupware* (Favela and Decouchant 2003). Such systems aim at facilitating communication between members by raising the awareness level about common goals and data and about other network members. Various methods are used, such as posting the identity, history and goals of each participant, as well as common goals, tools and work in progress of the group. In this way, group cohesion and efficiency can be increased markedly on the network.

Different groupware systems have been designed for e-learning, collaborative diagnosis, sharing work information, etc., but they obviously assume a fairly small number of participants (typically about ten to thirty members). It is also common for virtual group members to know each other already at work, or to meet face-to-face sooner or later. It is then possible to try to turn the virtual group into a tightly-knit community.

This is a perfectly legitimate and interesting research field, and applications in real life are probably to be expected soon. But it should be clear that groupware techniques are designed for small groups and would not be adequate for a higher number of participants, or for more casual, open participation patterns.

In short, we do not believe this conception of small, tight communities to fit all electronic groups. This picture may be adequate at times, but it will also be false more often than not.

4.2 Typical virtual characteristics

There is in fact a variety of virtual communities, depending in the exact communication technique, the system users, the discussion theme, the task at hand... Techniques such as e-mail or instant messaging are used mainly for one-to-one communication, but may include several participants (although communication quickly becomes awkward with a number of participants). Discussion lists (by e-mail) can accommodate a higher number of participants. Newsgroups, forums and wikis have been designed for many-to-many interactions, and do attract large numbers of participants. Public documents such as Web pages or weblogs are read passively, but may be used to co-ordinate many users.

Empirical sociological surveys of actual usage are sorely needed, but the domain is a moving target: techniques and practices are in constant flux. This is why we will not attempt here a thorough description of current methods. No wonder that the literature on this subject is still poor and contains much anecdotal evidence rather than systematic studies.

One may easily notice, however, some characteristic features of computer-mediated communities (Gensollen 2004). We do not claim that those features are common to all such communities, nor even to a majority of them. But those characteristics are often found in virtual communities, and are typical of electronic communities as opposed to traditional communities.

Here are some of the most salient features of virtual communities:

– participation is often occasional, or a one-off occurrence,
– participants are frequently anonymous or use pseudonyms,
– groups may be quite large, with hundreds or thousands of participants,
– there are active participants, but also many passive readers,
– group membership is often temporary,
– there seems to be little group awareness,
– group structure is highly flexible,
– contributions to the discussion are often addressed to no one in particular,
– many contributions are apparently ignored,
– there are few personal relationships, and they are unstable,
– the discussion style is usually cold and unemotional, (except for some aggressiveness which serves social control purposes),
– interactions are not between persons, but revolve about a common object, goal or task,
– interactions contribute to the construction of a common workspace,
– contributions are mostly goal-oriented.

In short, interactions tend to be instrumental and impersonal. They contribute to common objects rather than to personal relations. The underlying conception might be called a *blackboard* model: interventions are posted in a public workspace in order to further some common goals, but the individual origin of interactions is less important than their effect on the state of the common discussion or task.

This may be seen as a form of distributed or situated cognition. Interactions are determined by a common environment, which they continuously modify. But explicit collaborative activity between individuals is minimal, as most interactions take place indirectly through the common public workspace.

Again, this is the picture of an ideal type. One doesn't always observe all these characteristics at the same time or to the same degree. But they are typical of a new kind of group where a common task supersedes interpersonal relations.

There are differences according to the particular communication method. In this respect, forums and newsgroups are probably the most typical of computer-mediation techniques. But discussion lists or wikis are usually not anonymous, and e-mail is clearly used for more personal interactions. Most techniques are asynchronous, making communication less personal, except for chats or instant messaging.

One may object that such impersonal communities are degenerate cases, and that virtual communities are normally closer to traditional social groups. In defense of this line of thought, it would certainly not be difficult to find examples of computer-mediated communities with a high degree of social cohesion, group awareness and personal interactions. However, the kind of instrumental communities we have just outlined has become very frequent by now, perfectly functional for a range of uses and in constant progression. In fact the impersonal nature of virtual communication often proves rather beneficial.

4.3 Benefits of virtual communication

In our experience, virtual groups are quite efficient to launch a research project, to organize a seminar or a workshop, to put together a journal issue, to solve

technical problems, to work on open-source software... It is perfectly possible to work with people one has never met (and possibly will never meet), with the pleasure of getting things done while fulfilling a common goal. The list of possibilities is wide open and new application domains come to light repeatedly. Such endeavors are usually successful with a minimum of fuss: general emotional overhead is low and personal conflicts are rare.

Virtual communities present very interesting advantages indeed for social communication. The factual character of written interactions, the timelag required to respond, the lack of affective overtones are very useful to solve technical problems without undue emotional noise. Electronic communication is a ''cool'' medium. Personal conflicts are also rare because of the temporary nature of group membership, whereas members of real groups must perforce stay together, making power struggles unavoidable. Virtual communities are generally more flexible and constructive, and adapt easily to new circumstances.

Features of ordinary face-to-face communication would in fact prove harmful for typical virtual groups. The attention given to personal interactions is irrelevant for many technical tasks, and the expression of emotions would only complicate the task resolution process. Moreover, the lack of vocal intonation, facial expressions and body language makes it difficult to express emotional attitudes unambiguously. Subtleties are apt to cause misunderstandings and should best be avoided in favor of a simple, direct style.

Of course, there is a typology of tasks which are well suited to computer-mediated interactions. The narrow bandwidth, slow rate of interaction and (mostly) written exchanges are inadequate for vague, poorly defined and open-ended problems. In such cases, face-to-face meetings and telephone conversations are necessary till a common context of goals and rules has been agreed upon and the precise nature of the problem or task has been defined. Virtual groups are efficient when there is already a common cultural context and a clear awareness of the common goals. It is important in practice to understand when electronic communication is likely to be fruitful and when it will only lead to frustrations.

Lastly, it should be obvious by now that virtual communities are well adapted to the general social trend toward more impersonal relations that we have described above. Temporary, open, flexible social links, on a goal-oriented rather than a personal basis, are typical of modern society as well as of virtual communities. In this way, computer-mediated communities participate in social evolution.

5 Discussion

The picture of communities, either real or virtual, that we have just outlined is too simple, however, and deserves further discussion. We have assumed so far a binary opposition between community types, but there is in fact much more diversity, calling for various practical recommendations according to social context.

5.1 Diversity of social groups

Following a classical sociological distinction, we have contrasted here two opposite types of social association, closed traditional communities and more

open modern groups. We have placed virtual communities squarely with the latter type, emphasizing the impersonal and flexible nature of virtual relations.

This is of course a simplification, both for ordinary social groups and for computer-mediated communities. Real communities fall somewhere in between closed *Gemeinschaft*-type communities and more modern *Gesellschaft*-type communities. Even if the general evolution of modern society tends toward the latter, there are elements of both in many social groups.

When one examines real communities more closely with an open mind, it appears that the typical features of community types are not always present at the same time. For example in traditional *Gemeinschaft*-type communities, some of the features usually mentioned (small group size, frequent physical contact, stable personal links, emotional aspects, group solidarity...) might well be absent and there is in fact much variation (Brint 2001). The notion of traditional community is a convenient fiction, an ideal type.

Modern *Gesellschaft*-type communities also show enormous variation. They usually include both weak impersonal links and islands of stronger, denser personal relationships (among a background of general flexibility). Personal links and emotional ties have certainly not totally disappeared from modern life (Luckmann 1970) and can still be found in families, circles of friends, and small work groups (e.g. in a workshop, office, store...). It would be absurdly dogmatic to deny the persistence of close relationships in modern society.

In the same way, there is a diversity of virtual communities. Some of them are in fact very close to traditional communities, of which they are just an electronic translation. Pre-existing communities (a circle of friends for example) may turn to electronic communication as an additional medium without changing their fundamental nature. There is for example a fairly common use of e-mail to maintain family or friendship ties, in the same way that cell phone are often used mostly to maintain pre-existing family ties.

Virtual communication techniques may also serve to establish links between people which could not easily meet otherwise (because of disabilities for example), with the explicit intent to create strong personal relations and a close community. The members of such virtual communities usually meet face-to-face sooner or later. This kind of motivation has been the source of quite a few experiments in electronic sociability, and an incentive to the development of new communication techniques on the Internet.

Conversely, many virtual communities do not require any group awareness to function correctly and do not usually lead to personal relationships. The enormous success of peer-to-peer file exchange systems such as Napster or KaZaA is based on common goals (downloading free music) but do not require personal links. In fact system users may be blissfully unaware of the participation of other members of the network (Memmi and Nérot 2003).

5.2 Practical recommendations

What are then the concrete recommendations one may offer system designers? Although virtual communities are diverse, they often are quite different from traditional, tightly-linked social groups. Designers of communication software should be conscious of this social diversity before attempting to formulate appropriate design guidelines.

More generally, one may think that any social group requires both operational and integrative activities (Mintzberg 1979; Zacklad 2003). To survive, a group must act upon the outside world and solve external problems, but also devote a variable proportion of its time and energy to maintain its internal cohesion. Although common goals and common activities go a long way toward ensuring a minimum of cohesion, social communication, common norms and group rituals are probably indispensable for efficient co-operation within the group.

There should probably be a minimum of shared references, values and goals for a group to function in any meaningful way (even mere communication for communication's sake cannot take place without a shared world to talk about). One must make sure that this minimal togetherness is already present to start with, or care should be taken to bring it about somehow. The function of traditional group rituals is to promote social cohesion, and virtual equivalents must be found in cyberspace.

Yet, if virtual communities with impersonal *Gesellschaft*-type characteristics are so common, the question arises as to the right communication tools for such communities. Software designed for smaller groups will not be adequate and will probably prove too cumbersome for larger communities. For example, posting and maintaining user identity is basically irrelevant when participation is occasional and there may be hundreds of participants. Forcing users in this case to post their identity by filling in a questionnaire may simply turn people away.

Some of the discussion tools available nowadays do offer interesting features. Forums and newsgroups are organized around specific themes rather than on a personal basis. Discussion threads inform users when a new message has been posted on a given theme, but not necessarily from a particular person. The recent *wiki* technique (a kind of interactive discussion panel) is probably inadequate for too many participants, but it emphasizes the common discussion theme rather than personal interactions. Such features seem, however, to have been designed by trial and error rather than from fundamental considerations about the nature of virtual communities.

In short, we feel that the necessary co-reference to a common world and togetherness of purpose is often achieved in cyberspace without the need for elaborate software tools. Still, it is very important to offer easy access to a common base of shared constructs (such as texts, programs, discussion threads...). This is a form of situated cognition: implicit co-ordination by a common environment which is constantly updated by a whole community.

5.3 Social networks

There is nevertheless a research domain which is better grounded in sociological theory and mathematical modeling: structural sociology or network analysis (Degenne and Forsé 1994; Wasserman and Faust 2004). This domain is both interesting for its own sake and relevant to the study of virtual communities. It dates back to the 1940s and has developed mostly in the past 30 years (in line with recent social evolution).

Structural sociology has elaborated formal models of social groups seen as networks of relations. The complexity of real social interactions is deliberately simplified so as to represent a group by a graph, in which nodes are actors and

links are relations. Social interactions are reduced to simple relations, such as collaboration, advice or influence. This is clearly a drastic simplification, which makes it possible to develop computer models of social groups.

The structure of the network is both a resource and a constraint for individual actors. Social links give access to information, but some positions in the network are more favorable than others and this can be precisely quantified (notably by measures of centrality, influence or autonomy). The behavior and strategy of actors can then be explained or at least analyzed by reference to their position within a social network (Burt 1992).

Without going into more details, the point is that structural sociology is well formalized and sufficiently advanced to offer relevant representation tools for larger communities. Representing groups with hundreds of members is not a problem and the abstract nature of links (edges in a graph) is suitably impersonal. For larger modern communities, these formal methods would be a better source of inspiration than current groupware techniques. By shifting attention from personal relations toward group structure, network analysis is a more revealing approach to describe the functioning of impersonal *Gesellschaft*-type communities.

From a practical point of view, structural methods could be used to map the current state of a community and to show participants their position in the network, the coherence of the structure, what the sub-groups are, and the dynamic evolution of the network. This would be another way to raise group awareness, not in personal terms but from a structural, more abstract perspective. The relevant methods are readily available as software packages.

Still, when participation is only occasional or unique, and when interactions are totally impersonal (following the blackboard model), the notion of structural network loses significance. If all interactions take place through a common workspace, the most one could probably hope for is to make it easy for users to enter the system and to deal with common objects. A good blackboard design and convenient access and modification procedures are then necessary. And in practice, a dedicated and experienced moderator or co-ordinator is crucial for a virtual group to function properly and to keep course over time.

6 Conclusion

We have tried to investigate the nature of virtual communities which emerge from the use of recent electronic communication techniques. When examined as objectively as possible, it appears that computer-mediated communities may differ markedly from traditional communities, or rather from the idealized image of small, tightly-knit communities based on strong personal relationships. This image permeates popular discussion, but is inadequate to describe modern social groups in general and virtual communities in particular.

Virtual communities are often large, and show casual, impersonal relations. Group membership is mostly goal-oriented, frequently temporary, and group structure may evolve rapidly. Designers of communication software should be aware of these typical characteristics in order to tailor their products to the real needs of virtual communities. Allowing easy access to a common blackboard structure is usually more important than fostering personal relations. As a

matter of fact, various collaborative methods do take such features into account, but more haphazardly than from a systematic perspective.

The rise of these virtual communities also illustrates and accompanies a long-term social evolution which dates back to the nineteenth century (at least) and which has accelerated in the past quarter century: the general transition from strong personal relationships toward more abstract and flexible social links. In this respect, recent technical developments are just another manifestation of fundamental social trends. Virtual links are simply the electronic version of modern social relations.

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