

CONFERENCE "TRUST AND COOPERATION IN ONLINE INTERACTION",
COLLOQUIUM OF THE ROYAL DUTCH ACADEMY OF ARTS AND SCIENCES (KNAW),
AMSTERDAM, MAY 3-5 2005.

Background: Each year, the Royal Dutch Academy of Arts and Sciences offers at most six researchers the opportunity to organize a conference on its premises. The scientific level of these conferences should be high, and the topic of the conference should be at the heart of contemporary scientific debate.

Venue: Het Trippenhuis, Amsterdam (<http://www.know.nl/organisation/rooms.html>)

Host: The Royal Dutch Academy of Arts and Sciences
(KNAW, <http://www.know.nl/english/>)

OUTLINE "Trust and cooperation in online interaction"

For many kinds of interactions there are problems of cooperation between actors that have to be solved to reach the full benefits of interaction. For all kinds of cooperation, some degree of trust is necessary to get mutual cooperation going. One of the main reasons for the increased significance of (solving) trust problems is that modern technology – with the Internet as its driving force – has made it much easier to interact with potential cooperation partners without actual face-to-face contact. Technology has therefore made the problem of trust and cooperation more salient. Many of the cooperation problems that can occur 'in the real world' now have a virtual counterpart, but the conditions under which one is to solve cooperation problems online strongly differ from the conditions under which people are used to solve their issues of cooperation. Some factors make cooperative behavior online more difficult than offline. For instance one cannot see the other party in person and single-shot encounters are very common on the Internet. However, the Internet also offers new possibilities and solutions to cooperation problems.

This creates challenges, also for social scientists. *How do people deal with trust and cooperation problems under these new and relatively unknown circumstances? In other words, what are the conditions under which trust and cooperation in online interaction can prosper?* These are the main questions that the contributions to the conference will answer. The presentations will elaborate on the answers with regard to different fields of applications, namely [1] interaction in online auctions, and [2] interaction for the purpose of knowledge sharing and interaction for the purpose of exchanging social support. We highlight the current state of affairs in these two areas.

Online auctions In online auctions buyer and seller face problems of trust. For the buyer it is not sure whether the advertised goods will be delivered, and if they are, in what condition. For the seller it is far from certain that the buyer will pay in time. Auctions try to foster cooperative behavior by installing *reputation systems* (Kollock, 1999). As in real life, one can gain and lose reputation. The idea is that opportunistic behavior by buyers and sellers will be discouraged through the presence of this system, because such behavior will become public knowledge – visible to all other Internet users – and therefore damage one's 'auction reputation'. Research in this area suggests that reputation scores indeed have an effect on both auction prices and the probability of sale (Diekmann and Wyder, 2002). Moreover, 99.1% of the comments about other auction users is positive (Resnick and Zeckhauser, 2002). Apparently, the reputation system works: there is a bonus for buyers and sellers who behave themselves, and opportunistic behavior is relatively scarce. However, the precise effects of reputation are ambiguous; different studies focus on different components of reputation and often reach different conclusions (Dellarocas 2003; Resnick and Zeckhauser 2002; Snijders and Zijdemans 2003). How can

this be? Is this an indication that the mechanism is not well designed after all, or that many users do not yet understand how to best process the information provided? And, does the low percentage of negative feedback really imply that the reputation system works, or does it simply show that people are reluctant to give negative feedback? Worldwide, about 50 to 60 papers have been written on reputation systems, by an informal community of about 30 researchers, of which a handful reside in The Netherlands (mainly at Eindhoven University of Technology, Utrecht University, and the University of Amsterdam). Both from a theoretical and an empirical point of view there is a consensus that reputation systems facilitate online cooperation, but many questions still remain unanswered. How can these systems be designed so as to promote honest feedback about other members? In which way could the reputation score be adapted to get more efficient outcomes? What is the impact of more detailed reputation mechanisms than the ones as used on eBay? Though reputation mechanisms as a technology for building trust and fostering cooperation in online trading communities are known best from auction sites, these mechanisms are poised to have a much wider influence on online interaction and public opinion formation, impacting both online and offline organizations.

Online exchange of knowledge and social support Another kind of online interaction takes place in so-called virtual teams or online groups for the purpose of the exchange of knowledge (e.g. Jarvenpaa, Knoll, and Leidner, 1998; Jarvenpaa and Leidner, 2000) or social support between group members (Cummings, Sproull, and Kiesler, 2002; Henry, 1997). Until now research showed that such online settings have a large beneficial *potential* for knowledge exchange (Cothrel and Williams, 1999; Constant, Sproull, and Kiesler, 1996; Sproull and Kiesler, 1991) and for the exchange of social support (King, 1994; Winzelberg, 1997; Dunham et al., 1998; Finn, 1999; Preece, 2002; McKenna and Bargh, 1998; Whitty, 2002). That is, we know that successful interaction is *possible*. However, the typical problems of cooperation are a barrier that has to be overcome for *realizing* this potential. Members of virtual teams in organizations or online groups on the Internet are reluctant to cooperate by giving away information since it costs time and efforts and may endanger one's own position (Johnson, 2001; Matzat, 2003). Members of online *social support* groups also face problems of cooperation and free rider behavior (Markey, 2000; Matzat, 2003). Hence, online groups and virtual teams have a potential that cannot be reached automatically by the provision of advanced information and communication technology alone. Additionally, knowledge about behavioral dynamics under social conditions has to be utilized to solve problems of cooperation. This has been realized in the applied consultancy literature (e.g. Kim, 2000) and also in the research literature (DiMaggio, Hargittai, Neuman, and Robinson, 2001). Recent research therefore analyzes *under which social, institutional, and other conditions* online groups and virtual teams are more likely to reach their goals (ibid.). It is analyzed under which conditions members are more willing to give information to co-members of their team respective group or under which conditions members of online groups are stronger motivated to give emotional support. Indeed some authors argue that the emergence of cooperative norms is of key importance here (McLure Wasko and Faraj, 2000).

Some preliminary findings are as follows. Jones and Rafaeli (2000) argue that for large social support groups on the Internet it would be better to use asynchronous rather than synchronous communication tools. According to Preece (2000) some communication tools, such as Bulletin Board Systems, would facilitate the development of empathic communication (which is important for the exchange of social support) more than other tools, such as emailing lists. The involvement of the member's friends, family, and acquaintances in the online group has shown to increase the received online support (Cummings et al., 2002). Moreover, computer skills and ways of coping with disabilities may be of relevance for special subgroups of Internet users (Wright, 2000; White et al., 1999). Some important group conditions that would influence the willingness to *share knowledge* with others are: the group size, the heterogeneity of the group with respect to information interests or with respect to the quality of the information (Thorn and Connolly, 1987), anticipated future interaction of the members, information about past interaction, identity persistence, well-defined group boundaries,

visibility of the individual's contributions (Kollock, 1998), feelings of common group identity (Sassenberg, 2002), and – for virtual teams within a locally distributed organization – the amount of time spent working apart (Griffith and Neale, 2001). In the Dutch research community especially the potential of online groups for knowledge sharing has attracted much attention (Verburg and De Ridder, 2003; Matzat, 2001b). Much of this research has just started but is now gaining momentum (see e.g. Kok and Van der Veer, 2003; Van Fenema and Go, 2003). Additional factors of influence that come up within the research community are the degree of informational or relational uncertainty (Van der Rijt, Van den Hooff, and De Ridder, 2003), the degree of embeddedness of online interaction into offline networks (Matzat, 2004), the degree of multifunctionality of the group for its members (Matzat and De Vos, 2000), as well as the match between techniques for managing interaction problems of group members and the type of the online group (see Verburg, De Rooij, Den Hartog, and Andriessen, 2003; Matzat, 2001a for details). What is needed is first of all more empirical research that tests the hypotheses and moreover a better theoretical elaboration of the underlying mechanisms that link these factors and the willingness to share knowledge or to exchange social support.

The rising practical importance of online cooperation problems invites rigorous research in these largely virgin territories. How can one promote socially desirable outcomes? In order to answer these questions, collaboration is needed between several traditionally distinct disciplines, such as sociology, economics, computer science, marketing, law, and psychology. In each of those communities, researchers are actively working on aspects of the impact of the Internet and their work has been well received within their own disciplines. Although scientific interest is booming, not many research groups have been formed. One group of researchers interested in these topics has emerged in the US, mainly but not exclusively around reputation systems in auctions. A second group has emerged in Germany, joined within the German Society for Online Research (DGOF), focusing on more general online research. Besides these two groups, there is an informal community surfacing of separate scientists throughout Europe, including the Netherlands, who meet each other at disciplinary conferences and workshops.

The conference would be an excellent opportunity to gather these separate researchers and identify opportunities for cross-fertilization of ideas. Our aim is to follow up on both the April 2003 "Interdisciplinary Symposium on Reputation Mechanisms" at MIT in Cambridge (www.si.umich.edu/~presnick/reputation/symposium) and the "Trust and community on the internet" symposium, (<http://www.uni-duesseldorf.de/~matzat/conference.htm>) held in August 2003 in Bielefeld, Germany. The invited speakers are the leading researchers in this field from the US, Germany, The Netherlands, and other European countries (see list of speakers). Topics include theoretical and empirical contributions concerning online reputation systems and electronic market systems, knowledge sharing across the Internet, the Internet as a tool for data collection, and the exchange of social support in online groups. Contributions to the conference can cover three types of problems. First, theoretical analyses of conditions for the development of trust and cooperation: general theoretical models that specify when and where appropriate conditions can be found on the Internet or to what extent such conditions can be created. Second, empirical analyses of examples of mechanisms that further the building of trust and cooperation: empirical analyses can identify the type of conditions that are found to be favorable for the development of trust or communities. A special point of interest for empirical analyses is to assess whether the mechanisms are specific to the Internet or online settings, and could not be realized otherwise. A third type of contribution considers social, technical, and legal conditions and their relation trust and cooperation online. The general theoretical models and empirical analyses can be used to investigate the perspectives of Internet research to further the development of trust and communities on the Internet. Social, technical, and legal conditions have to be taken into account to examine the potential as well as the limitations of the Internet for the development of trust and cooperation.

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Participants & tentative schedule

Day 1 and 2

Reputation mechanisms – theoretical contributions

Prof. dr. Gary Bolton, Dept of Management Science, Penn State University
Dr. Urs Fischbacher, University of Zurich
Prof. dr. Andreas Diekmann, Dept of Humanities, Social and Political Sciences, University of Zurich
Prof. dr. Michael Macy, Dept of Sociology, Cornell University
Prof. dr. Chris Snijders, Dept of Technology Management, Eindhoven University of Technology

Reputation mechanisms – empirical contributions

Dr. Chris Dellarocas, MIT Sloan School of Management, Cambridge
Prof. dr. Axel Ockenfels, Dept of Economics, University of Cologne
Dr. Paul Resnick, School of Information, University of Michigan

Exchange of knowledge and support – theoretical contributions

Dr. Andreas Flache, Dept of Sociology, University of Groningen
Prof. dr. Werner Güth, Max Planck Institute for Research into Economic Systems, Jena
Prof. dr. Hartmut Kliemt, Dept of Philosophy, University of Duisburg
Dr. Peter Kollock, Dept of Sociology, University of Washington
Dr. Marc Smith, Research sociologist, Collaborative and multimedia systems group, Microsoft.

Exchange of knowledge and support – empirical contributions

Prof. dr. K. Cook, Dept of Sociology, Stanford University
Dr. Uwe Matzat, Dept of Technology Management, Eindhoven University of Technology
Dr. Arno Riedl, Faculty of Economics and Econometrics, University of Amsterdam
Prof. dr. Frans van Winden, Faculty of Economics and Econometrics, University of Amsterdam

Day 3

Masterclass sessions [course leaders in brackets]:

Masterclass, part I	Theory and evidence on online groups [Dr. Nicola Döring, Technical University of Ilmenau Dr. Uwe Matzat, Eindhoven University of Technology]
Masterclass, part II	Nonreactive data collection on the Internet [Dr. Dietmar Janetzko, University of Freiburg]
Masterclass, part III	Reactive methods of data collection: Online experiments and web-surveys [Dr. Ulf Reips, University of Zurich]
Masterclass, part IV	The Analysis of Social networks [Dr. Vincent Buskens, Utrecht University]

Regarding the Masterclasses: the common feature of all conference presentations is the analysis of typical problems of cooperation that emerge in online settings for groups of people. The study of problems of interaction in online groups is fundamental for doing social scientific research on the shaping of the internet which offers opportunities for influencing its outcome for society. Since the Internet and other kind of ICTs have a growing impact on society, more research of this kind is needed in the future. Therefore we would like to offer younger researchers the opportunity to get acquainted with the basic questions, findings, problems, and techniques of doing research on that topic. The first masterclass gives an overview of important research questions that have been analyzed until now. The potential practical implications for humans, organizations, and business companies are made clear. Theories about interaction in online groups are discussed, their empirical validity is presented and emerging new questions and problems for future research will be outlined. Additionally, the first course sketches briefly what kinds of data collection opportunities for the analysis of online groups are available and what techniques –beside the standard techniques for multivariate statistical analyses – are needed for answering what kind of questions. Some of these modes of data collection and data analysis techniques are presented in much more detail in the other classes. The second class gives an overview of what kind of data about interaction in online groups can be collected automatically without having to approach individuals, and how the data can be analyzed. Topics of this course are log file analyses (client and server analysis), techniques of time measurements (e.g., via Perl scripts), cookies, and the use of environment variables of web servers. The third class presents the opportunities for and restrictions of conducting online experiments for testing hypotheses in the social sciences. Moreover, the course will give a complete overview of techniques, methods, and tools for conducting online experiments and web-surveys on the Internet. The members of the course will practice the new insights by setting up their own experiment on the Internet. The fourth masterclass presents the techniques of the analysis of social networks, and shows for what questions in the research field the techniques have been applied and could be applied in future research. This topic is included because much of the social impact of the Internet is related to (the structure of) social contacts that group members have. The complete course package allows researchers to develop their own questions, to relate them to existing research, and to choose the adequate method of data collection and data analysis for conducting their research project.

Scientific committee

Prof. dr. C.C.P. Snijders (Eindhoven University of Technology)

Dr. U. Matzat (Eindhoven University of Technology)

Prof. dr. Andreas Diekmann (University of Zurich)

Prof. dr. Michael Macy (Cornell University)

Drs. Richard Zijdeman (Utrecht University) – Research and managerial assistance