ANALYSING RESEARCH COLLABORATION ON THE MICRO LEVEL – THE PERSPECTIVE OF INDIVIDUAL SCHOLARS IN THE IS DISCIPLINE

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Abstract

Virtual organisation of work is not unproblematic. An extensive body of research exists on topics like virtual teams in enterprise contexts. Similarly, in a scientific context many studies analyse collaboration among scholars. However, most studies here focus on the macro level (e.g. policy issues and the organisation of research projects). The role of the individual scholar in this is vastly ignored. I present observations from a qualitative study investigating research collaboration in taking the perspective of individual scholars in the IS discipline. I explore the different contexts of interaction in which scholars execute collaboration, and also the emergence of scholars’ individual social networks. Further I analyse tool usage, specifically focusing on Social Software, which, comparable to enterprise contexts, is gaining increasing attention in the academic context. Based on my observations I present two sets of propositions aiming at the emergence of a scholar’s professional social network and an adequate usage of tools for supporting collaboration.

Keywords: Research Collaboration, Social Software, Social Network.


1 INTRODUCTION

In the past decade we have observed a profound transformation of the organisation and practices of research. Most obvious is that research is increasingly collaborative throughout the majority of disciplines (Cummins & Kiesler, 2008; Wuchty, Jones, & Uzzi, 2007). Olson et. al. (2008) list a number of reasons for this development in scientific research: the urgency, complexity and scope of unsolved scientific problems; the need for access to new, and often expensive, research instruments and technologies; pressure from funding agencies; and information and communication technologies (ICTs) that facilitate interaction and sharing of knowledge. However, a clear understanding of the nature of academic collaboration and how it can be supported does not yet exist. Research has to a high extent focused on the macro level, e.g. in taking the perspective of policy makers (e.g. Cummings & Kiesler, 2008) and perceiving research collaboration as the collaboration in funded research projects. Other articles analyse the publication behaviour of scholars (e.g. Wuchty et al., 2007) or how specific factors influence the publication performance (e.g. Ponds, Van Oort, & Frenken, 2007). In all these research endeavours the role of the individual scholar is vastly ignored (van Rijnsoever, Hessels, & Vandeberg, 2008). Beyond that the research is scattered and focusing on various disciplines. This hardly allows one to create a consistent perspective on the subject.

Only in enterprise contexts a rich set of research can be found analysing virtual work on a micro or meso level (e.g. Ciborra & Suutens, 1996; Orlikowski, 2002), but results that stem from such research are not necessarily transferable to academic contexts. Hence most available knowledge on virtual work in an academic context relates to the macro-level. However, I think that conclusions that stem from a macro level analysis most likely will not help to significantly improve the performance of the individual scholar. Further, I feel that only by improving research performance on an individual level the overall outcome of the community can be improved. We have some evidence that signifies the limited potential of macro level actions for increasing research productivity: Despite the strong trend towards collaboration, most attempts by funding agencies to foster the creation of larger collaboration networks throughout different disciplines seem to fail. An example for this are the Networks of Excellence funded in the 6th Framework Programme of the European Commission (Bonaccorsi, Horvat, Maimets, & Papon, 2008). Until now, ICT support has not created the expected benefits. This, as has been shown in enterprise contexts (Riemer & Klein, 2008), is partly caused by the limited potential of ICT to create a rich communication environment, but most likely also has to be attributed to the absence of a clear strategy on how ICT can mediate between individual scholars (Riemer, vom Brocke, Richter, & Große Böckmann, 2008).

I suggest focusing on the individual scholar and his/her needs for support in collaboration as a starting point for improving research productivity in general and ICT support in particular. In the paper I take a first step to understand the situated context of collaborating scholars, including tool usage and practices of use. In doing so, I include all contexts (such as research projects, conferences etc.) in which scholars interact with each other, as well as an understanding of how a scholar switches between these contexts. To the best of my knowledge this research is unique in analysing research collaboration from the perspective of the individual scholar. I think that only by creating a full understanding of the situated context of scholars, means can eventually be identified that help improve their research productivity. My work mainly aims at understanding the situated context of scholars. I will, however, also discuss potentials for ICT-based support, specifically the potential of new IT artefacts subsumed under the term of Social Software are of interest to me. Social Software succeeds in facilitating collaboration between strangers on the Internet and today is being rapidly adopted by companies (Davenport, 2008). Such IT artefacts include wikis, blogs and Social Network Sites (SNSs). Especially the latter can help in creating and maintaining social structures (Richter, Riemer, & vom Brocke, 2010). Hence, scientific collaborations might benefit from such IT artefacts as well. Consequently, in recent years some articles have been concerned with the rise of computer mediated science (Heimeriks, Van den Besselaar, & Frenken, 2008) and in specific with Social Software and how such tools can support the emergence and execution of collaborative research (Soeldner, Bullinger, & Moeslein, 2010). However, I find evidence that the concentration on the macro level as well as the support for research projects as proclaimed in literature is not reflecting the
needs of individual scholars. Instead, I propose to concentrate on the individual scholar and his/her dyadic collaboration, e.g. ICT support for (distant) discussion with a co-collaborator.

The paper proceeds as follows. In section two I begin by providing a brief introduction into the literature on research collaboration and introducing Social Software. Moreover, the methodological approach of the study is described. In section three I provide an overview on the main observations from the interviews. In section four I discuss these observations and derive two sets of propositions on the situated context of scholars engaged in collaborative efforts as well as on the need of such scholars for tool support. I conclude the paper with a short summary.

2 STUDY OVERVIEW

2.1 Research Collaboration and Social Software

Academic knowledge production has been changing over the last two decades. Besides the notion of increased collaboration (Olson et al., 2008) a stronger orientation towards strategic goals (Irvine & Martin, 1984) and the production of relevant knowledge (Gibbons, 1994) can be observed. Different conceptual understandings of the change in the scientific knowledge production exist, with the most prominent example probably being “Mode 2” knowledge production (Hessels & Van Lente, 2008). “Mode 2” knowledge production, as introduced by Gibbons (1994), is characterised by taking place in a context of application, transdisciplinarity, heterogeneity and organisational diversity as well as novel forms of quality control. However, a notable amount of critique exists towards “Mode 2” as well as its alternatives, most claiming a missing empirical foundation (Hessels & Van Lente, 2008; van Rijnsoever et al., 2008). A general understanding of the change that scientific knowledge creation is undergoing is still missing. When taking a look at current research articles in the field (e.g. by means of the literature review by Soeldner et al., 2010 or Bukvova, 2010) it becomes obvious, that, despite an extensive number of publications, research on scientific collaboration is fragmented and often based on a macro level analysis (Soeldner et al., 2010; van Rijnsoever et al., 2008). Research seems to concentrate on conceptualising as well as analysing existing forms of institutionalised collaboration (Soeldner et al., 2010), vastly ignoring the role of the individual scholar (van Rijnsoever et al., 2008) as well as the mechanisms that lead to the emergence of collaboration. In particular, the social dynamics inducing research collaboration seem to be ignored. Much of the research presented above has taken a broad view on academic knowledge creation in focusing on multiple disciplines. Certain publications, however, focus on scientific knowledge creation and hence are of limited relevance to scholars analysing research collaboration in social science and specifically information systems. Still these publications draw a general picture of how academic knowledge creation is changing and provide first evidence on reasons and consequences that can be utilized for analysing research collaboration in information systems by plausibly arguing the relationship to specific observations in information systems research.

Recently, multiple studies have investigated the adoption of Social Software for research purposes (cf. Bukvova, 2010; Soeldner et al., 2010). SNSs, wikis, microblogging and social bookmarking services are types of what has been termed Social Software (Hipner & Wilde, 2005). In an enterprise context, feature-wise, Social Software is closely related to groupware (Groß & Koch, 2007), but often portrayed as being applied and used in a “Bottom Up” instead of a “Top Down” approach (Avram, 2006), as users generate the content and define the rules and reasons for usage (Boyd, 2006). As such, Social Software subsumes tools in the context of the larger phenomenon of Web 2.0 (Boyd, 2006).

2.2 Methodology

I present a study based on interpretive research. I have conducted nine open interviews with IS scholars in order to develop an initial understanding of the situated contexts of IS scholars engaged in collaborative research. Each interview took about one to two hours with about half being conducted face-to-face and the other half via Skype. The question blocks are displayed in Table 1. I started by asking for the professional career of the scholar in order to be able to suitably interpret the later statements. In the main part of the interview I asked for contexts of interaction and collaboration with
other scholars, tools that are used therein, as well as practices of usage. Further topics were the
differentiation of various types of contacts and the general usage of tools, especially Social Software.

The interview participants were three Ph.D. and post-doctoral students, three early stage scholars
(Senior Lecture, Associate Professors, Professors with less than five years work experience) and three
senior scholars. I have chosen this constellation in order to get an overview on the development of
scholarly collaboration over time. I have recruited some interview participants on IS conferences.
Beyond that contact to other participants was mediated by scholars from my department. The
interviews have been transcribed and coded with qualitative analysis software (Atlas.ti). In my
analysis I have been inspired by the principles of interpretive research by Klein and Myers (1999). In
particular, *The Fundamental Principle of the Hermeneutic Circle and The Principle of Contextualisation*
were relevant for me. In order to comply with the idea of the Hermeneutic Circle I have coded the interviews with the aim of creating a map of the participant’s statements on different
levels of abstraction. This enabled me to easily switch the view from details to a general view and
back again. I chose to interview a wide range of scholars, concerning age and geographical location as
they might perceive collaboration differently. I hence adhere to these differences, in the sense of *The
Principle of Contextualisation*, in making them explicit where necessary but moreover in using them
as a means to make sense of my observations. I have discussed preliminary findings with my late
interview participants in order to evaluate my findings. Beyond that I did present an early version of
my research at my research group for the same purpose.

<table>
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<tr>
<th>#</th>
<th>Block</th>
<th>Main Questions</th>
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<tbody>
<tr>
<td>1</td>
<td>Professional history</td>
<td>Where have you worked? What are your fields of interest? Can you name some</td>
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<td></td>
<td></td>
<td>Individuals (and the place where you have worked with them) that have majorly</td>
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<td></td>
<td></td>
<td>influenced you?</td>
</tr>
<tr>
<td>2</td>
<td>Contexts of interaction</td>
<td>In what contexts / rooms of interaction do you interact with other academics?</td>
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<tr>
<td></td>
<td></td>
<td>How would you characterise the cooperation in these contexts (Strength, Frequency,</td>
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<td></td>
<td></td>
<td>Purpose, …)?</td>
</tr>
<tr>
<td>3</td>
<td>Usage of tools in these contexts</td>
<td>What kind of tools do you use in these contexts and for what specific tasks?</td>
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<td></td>
<td></td>
<td>Can you summarize which tools you are using in general for interaction? Do you have a smart</td>
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<td></td>
<td></td>
<td>phone and how do you use it for interaction with other scholars?</td>
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<tr>
<td>4</td>
<td>Different types of contacts</td>
<td>Can you differentiate between different qualities of contacts (e.g. in sense of tie-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>strength)? How do you communicate with these different types of contacts?</td>
</tr>
<tr>
<td>5</td>
<td>Social software</td>
<td>What tools do you use and why? Do you use Social Software Services for research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>purposes? Can you think of potential usage patterns for the future? Do you miss a</td>
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<td></td>
<td></td>
<td>certain type of tool that could simplify your work?</td>
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*Table 1. Questions of the guided interviews*

3 PRESENTATION OF RESULTS

In the following I will briefly describe my observations as derived from the interview analysis. In
doing so, I will introduce the identified contexts of interaction. Further I will describe observations
towards the emergence of social relations and the usage of tools for supporting collaborative work.
Table 2 describes some core properties of my participants in listing the current position, country,
number of former home Universities and for each participant the number of visits to other Universities
(of three months or longer, separated by semicolon). I categorise the participants into three groups
based on the stage in their career.

3.1 Contexts of Interaction

From the interviews I have identified eight contexts (see Table 3). I will introduce and describe these
contexts as described by the participants, using the above presented grouping by career stage.
Table 2. Characteristics of participants

**Ph.D. and post-doctoral students:** Co-located contexts, not surprisingly, seem to be most important. This seems especially true for Ph.D. and post-doctoral students. Their research mainly seems to evolve around contacts that are either located at their home University or are mediated by their supervisor. Such mediation can be by intentionally being introduced to a potential collaboration partner but can also take place by participating in a research or industry project. Other means that help the participants to extend their social network are mostly those connected to mobility, e.g. in switching Universities, but also career communities, latter focus on the career development of scholars in the pre or post Ph.D. phase. In the pre-Ph.D. phase Ph.D. consortia are especially good opportunities to develop skills necessary for a scholar but also to initiate the development of a social network outside the home University. In the post-Ph.D. phase career communities offer the potential to extend the reach within the social network of IS scholars, and create long lasting social relations with peers. Consequently bilateral collaboration does exist, but only to a very limited extent. Switching to a new University has the highest positive influence on the social network development of the participants. In light of the observed high importance of mediation this seems intuitive as both Universities offer potentials for mediation.

<table>
<thead>
<tr>
<th>Group</th>
<th>Current Position</th>
<th>Current Country</th>
<th># Former Home Univ.</th>
<th># Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D. and Post Doc.</td>
<td>Ph.D.; Post Docs (x2)</td>
<td>Ireland; Germany; Liechtenstein</td>
<td>0; 1; 1</td>
<td>0; 0; 1</td>
</tr>
<tr>
<td>Early stage scholars</td>
<td>Senior Lecture; Associate Professor; Prof. [&lt; 5 years]</td>
<td>Australia (x2); Liechtenstein</td>
<td>1; 1; 1</td>
<td>1; 2; 2</td>
</tr>
<tr>
<td>Senior scholars</td>
<td>Prof. [&gt; 10 years], Prof. [&gt; 20 years] (x2)</td>
<td>Germany; USA; Switzerland</td>
<td>2; 2; 3</td>
<td>0; 2; 3</td>
</tr>
</tbody>
</table>

Table 3. Contexts, tie-strength and tool usage

**Early stage scholars:** The former home University plays a vital role in the development of social structures for the early stage scholars in my sample, since, often rich, social capital created during co-location can be used for on-going collaboration later on. Peers that have moved away from this
University often are the starting point for developing an international network. Moreover mediation by brokers (e.g. former supervisors) is a major source for extending one’s social network. Mediation can for example open entrance to conference or topic communities. Conference communities are typically relatively loose communities; examples are the AIS conferences. Denser communities can be found on smaller, topic-focused conferences. Topic communities are focused on a certain research direction. They provide a platform for scholars active in this subfield to discuss and advance the knowledge in the field. However the current home University is perceived as the most important context. The focus is first and foremost on teaching and organisational issues and secondly research. Geographic proximity enables smooth cooperation in providing rich potential for face-to-face communication as well as chance encounter. This mainly shapes communication behaviour at this stage. Besides face-to-face communication, email is the main medium. In the creation of publications bilateral relations seem to be most important. Often, the bilateral ties are mediated by former co-location or by brokers. Bilateral relations are mostly described as medium-strength or strong ties. This partly seems to stem from the fact that scholars choose their bilateral ties freely, as they are not bound by an institutionalised context like that of a department, editorial board or similar. Hence, to a large extent the participants base their choice of bilateral ties on sympathy and compatibility of research interests

Senior scholars: For senior scholars bilateral relations are mostly strong ties and, despite geographical distance, many such ties turn into friendship. Scholars, with whom a positive history is shared, are the preferred choice whenever partners are needed for any kind of institutionalised collaboration (e.g. in funded projects). Senior scholars make use of conferences and topic communities as contexts for interaction and face-to-face meetings, and further cooperate in various research projects. In contrast to younger scholars the importance of the current and former home Universities declines. The current home University is often first and foremost a place for teaching (incl. Ph.D. students) and organisational issues, whereas the most important contacts from former home Universities are now rather perceived as bilateral relations.

Early stage scholars, as well as senior scholars, are engaged in associations, editorial boards and both research and industry projects. Associations are comparable to communities, but inhabit a much larger and less densely connected group of individuals. Several IS scholars are organised in such communities. The most prominent example in our field would be the Association for Information Systems (AIS). Associations like the AIS are described by the interview participants as political, artificial, inhabiting weak ties mostly and are to a large extend used for signalling the belongingness to this specific research community. The Academy of Management can be named as a similar example. Editorial Boards as well as such for Conference organisation are only associated with organisational tasks, but rarely with network building. Communication takes place via email, phone conferences and occasional meetings. The contact to Industry partners is strongly characterised by two facts: First Industry is a potential sponsor and second a potential data source for research. Hence, the contact is often formal and communication sometimes fashions a political style. Research projects seem to play a very minor role for scholars. They are rarely mentioned as a context of interaction and only if asked upon. I have observed two different reasons for choosing a project partner. First, scholars mostly tend to execute research projects with befriended scholars, with whom they share a history of successfully working together. Second, funding agencies sometimes require for a specific group of partners, e.g. including x partners from y countries. Hence, sometimes partners are selected to fit the funding agencies requirements.

3.2 Development of one’s social network

In the following I will concentrate on observations regarding the emergence of social structures described by the participants. I observed that the structure and dynamic of one’s social network is perceived differently by scholars in different career stages (see Figure 1). The social network of Ph.D. and post-doctoral students is basically limited to the home University. They might collaborate with other scholars outside the University but most of these contacts seem to be mediated by their supervisor. Apart from mediation by brokers the only other thing to help with the emergence of contacts for collaboration is extensive mobility. Early stage scholars have a strongly growing social
network reaching into various contexts of interaction. Time limitations, however, already hinder the emergence of new, and especially strong, ties. Senior scholars report a relatively stable – core – social network containing befriended scholars that they interact with in various contexts. They, in contrast to the other participants, do not differentiate by contexts but more by single individuals. In general, two observations stand out for all participants that seem to foster the evolution of individual social networks:

1) The high impact of mediation by brokers.

2) The ease of finding a common base for working with members of the IS community.

Most contacts seem to be (1) mediated by supervisors or colleagues from the former or current home University. Participants also reported on other scenarios for the emergence of active ties: e.g. Participation in the same track of a conference (with papers that complement each other) or belonging to the same community (e.g. Topic Community). Especially for early stage scholars, however, the mediation of contacts to potential collaboration partners by brokers is essential.

Figure 1. Changing perception of the social network over time

In most cases engaging in collaboration seems to be relatively easy (2) once contact has been established. Some contacts end soon after having emerged, but the rest often become medium and even strong ties in a relative short time span. Occasionally meeting at social events (e.g. on conferences) seems to be sufficient to foster this development. Three major reasons for this have been stated by the participants:

1) Outside of the department the choice of contacts is not restricted by any organisational issues. Hence, collaboration partners seem to be chosen mainly based on sympathy, besides a general compatibility of research interests.

2) Similar theoretical backgrounds provide a common wording.

3) When engaging in new projects scholars tend to choose collaboration partners with whom they share a positive history of collaboration.

3.3 Tools for collaboration

For the participants tool choice is not defined by the context or the career stage and neither the task, despite being an important criterion. They rather described to use different tools for communication based on the scholar they want to interact with. While some interviewees reasoned that they would choose the channel where availability of the partner was most likely, mostly choice was described as defined by the bilateral communication history. Tool usage hence seems to evolve in dyadic interactions. Successful practices, however, seem to be transferred from dyadic interactions to group interaction, while the participants also try to introduce such practices in new collaborations. In the following I will describe a selected set of practices for the case of collaboration by a group of scholars on creating a publication; I then present a short summary on tool usage.

In the following description I draw on a case of distributed collaboration as described by one of the interview participants. In this case three scholars collaborate by means of email, phone, Skype and Dropbox. The initial idea for collaboration and a first brainstorming on the paper structure originated
from a co-located situation, i.e. a meeting at a conference (other examples from the interviews show, that based on a successful collaboration history, phone communications might substitute face-to-face interaction). Dropbox is used for exchanging document versions and also the research data. A specific naming convention is used ([project]_[version]_[editor]) which creates a document version history. Other means for signalling to collaborators that someone has worked on the document are not used. For discussions phone or Skype conference calls are set up, with the time and date being negotiated via email. Close to the submission deadline increasing use of the text-chat function of Skype was reported. This is used as it is a quick form of communication. The limited richness is not perceived as problematic as only issues of limited complexity are discussed in the final stage of writing. Further the presence awareness created by Skype is used in order to create ad-hoc discussion as time is missing to negotiate a conference call. When a collaborator changes the Skype status to ‘online’ current work might even be interrupted in order to make use on the chance of communication. In other cases described by the participants I found different variations of these practices, for example including email notifications to lock a document for editing.

<table>
<thead>
<tr>
<th>#</th>
<th>Tool</th>
<th>Purpose</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Email</td>
<td>Main communication channel</td>
<td>Broadcast as well as bilateral; Formal as well as Informal; Communication style often defined by the communication partner; Used for documenting communication; Available nearly everywhere (web access, Smartphone); Exchange of documents</td>
</tr>
<tr>
<td>2</td>
<td>Skype</td>
<td>All contexts, strong usage with bilateral contacts; One-on-one communication; Mostly strong ties</td>
<td>Strong cultural differences (no up to very intensive usage); Regularly send a short message in order to maintain contact; Presence information is perceived as very important; Extensive usage of the voice and limit of the text-chat feature</td>
</tr>
<tr>
<td>3</td>
<td>Phone</td>
<td>Nearly all contexts; Rather uncommon when co-located</td>
<td>Danger of not reaching or disturbing someone, hence often a fixed time for a call is defined; Often conference calls related to projects, associations or editorial boards; Whereas Email is used for organising paper writing, phone or skype is used for discussion</td>
</tr>
<tr>
<td>4</td>
<td>Dropbox</td>
<td>For sharing data</td>
<td>Shared folders with project partners; Commenting in documents as a form of communication; Integration of date and author name in the file-name for organising work</td>
</tr>
<tr>
<td>5</td>
<td>Social Network Sites</td>
<td>Management of weak ties; Information source for events and news of various kinds</td>
<td>Conserve distant contacts in case something comes up; Searching and contacting of reviewers; Signalling belongingness and stay informed by joining a certain group</td>
</tr>
<tr>
<td>6</td>
<td>Google Apps</td>
<td>Writing a project proposal; Analyse empirical data</td>
<td>Simultaneously work on a document</td>
</tr>
</tbody>
</table>

Table 4. Overview on Tools used in collaboration

In general, software tools seem to be used mainly for supporting communication. Email is most commonly used by all the participants. Further, phone and face-to-face communication are perceived to be very important. Skype is either used very actively or not at all. Furthermore, sometimes Dropbox and Google apps are used to share documents or work in a collaborative manner. SNSs are used to stay in contact with weak ties, signal belongingness or stay up to date (e.g. in topic communities). Seldom usage of weblogs, intranet sites, twitter and wikis was mentioned. A summary of the most commonly used tools is displayed in Table 4.
4 DISCUSSION

In the following section I will discuss two sets of propositions that are rooted in my observations. The first set aims at explaining the emergence of a scholar’s professional social network. This set creates a basic understanding of social relations in the academic community and how they emerge. The second set aims at discussing an adequate choice of tools for supporting collaboration. I hereby propose to concentrate on tool support for dyadic collaboration because bilateral relationships seem to be most important to scholars in research and to bear a strong influence on the evolution of one’s social network – as I point out in the first set of propositions.

4.1 Culture and emergence of social relationships in the IS discipline

Based on the interviews, I have observed three stages in the development of a scholar’s social network (see Figure 1). I will refer to these stages as the initial, the growing and the consolidated social network where the initial and the consolidated are rather stable compared to the growing social network. In the beginning of one’s career (Ph.D., post-doctoral) the initial social network, not surprisingly, consists mostly of contacts at one’s home University. Contacts outside the home University, if existent, mostly stem from collaborative research projects, mobility or communities like doctoral consortia. When the scholar becomes more independent (e.g. starting a position as a senior lecturer or associate professor), this leads to a growing social network almost immediately. Multiple points of contact with other scholars emerge and often former supervisors act as brokers. However, at some point, time restrictions limit the growth of the social network. Starting then the network seems to stabilise, with a (consolidated) core social network with a high level of interaction at its centre. While the grouping might partly be caused by my choice of participants and turn out to be not detailed enough when analysing the context of a larger set of scholars, I still derive the following proposition.

Proposition 1: In the development of the social network of a scholar three stages exist: The initial, the growing and the consolidated stage.

When stabilising, the social network also seems to change in nature. At the beginning of a scholar’s career the social network seems to consist of sub-networks that are rarely connected. This seems not to hold true anymore for senior scholars. Contacts are no longer bound to a certain context but span various contexts in which interaction took and takes place. Moreover, new contacts are seldom established. A core social network seems to evolve that consists of scholars that are perceived as friends or friend-like. In most professional activities scholars can now draw on this network of “friends” for finding collaboration partners. Similarly, Cummings and Kiesler (2008) found that prior experience with a collaborator predicts greater strength of a current collaborative work and reduces the negative impact of distance and disciplinary difference. Moreover, they state that familiarity created in collaborating increases the ease of working together in the future. Consequently, scholars tend to choose collaborators with whom they share a history. Including scholars without a shared history in research projects is even perceived as a high risk by some of the participants, due to possible differences in understandings and work ethics. Thus, over time scholars increasingly interact with the same individuals in different contexts. The transformation seems not to take place over a short time, but rather in a continuous process over the whole career of a scholar. This observation leads me to the proposition:

Proposition 1a: Over time a densely connected core social network evolves, containing individuals with whom interaction takes place in various contexts.

In the development of such social structures friendship seems to be a driving factor. As mentioned before the participants stated that they do not feel bound by any institutional limitations in choosing bilateral collaboration partners. Furthermore, participants stated that they could in theory collaborate with nearly any other IS scholar. Hence, the choice of collaboration partners is based on sympathy besides compatibility of research interests, often even inducing the emergence of strong friendships. The related proposition reads as follows:

Proposition 1b: Sympathy and friendship play a vital role in the collaboration among IS scholars.
4.2 Adequate tool support for scientific collaboration

In the literature overview I already pointed to the fact that research on scientific collaboration is often focused on the macro level and on research projects. The emergences of scholars’ professional networks, – as described above – however, leaves the impression that scientific collaboration mostly takes place in bilateral contexts, where single pairs or small groups of scholars collaborate, often not bound by any institutional contexts. Moreover, if scholars collaborate in institutionalised contexts, like research projects, the groups of scholars often have a history of collaboration (cf. proposition 1a) and are seldom willing to adopt new forms of ICT-based collaboration. Adopting project specific tools would require them to ignore tools and practices that they established as means of communication and collaboration in previous dyadic interactions. The participants at least were reluctant to abandon, tried and tested, practices in favour of yet another collaboration platform. Hence, I reason that practices of ICT usage evolve in bilateral interaction rather than being induced by policy decisions, e.g. in the context of research projects. My observations strengthen the proposal of Cummings and Kiesler (2008) to concentrate more on dyadic technology use instead of group technologies. Whereas they perceive the usage of common tools in distributed research projects as rather unlikely, they argue based on their data that in bilateral relations, and especially in those with prior experience, norms of usage and types of computer-mediated interaction do emerge. As described in the above set of propositions such bilateral relations rendered by prior experience seem to be typical for the IS discipline (cf. proposition 1a). Defazio, Lockett and Wright (2009) find that the impact of project collaboration on research output is weak while a research project is active, but significant in the period after the research project is finished. This further signifies the limited need for specific collaboration support aiming at research projects. Often research project consortia (e.g. in publically funded projects) try to support collaborative group work by providing means for joint knowledge creation, however the work of writing is usually done alone (or in dyads) while collaboration mainly manifests in discussions on a piece of work (Kraut, Galegher, & Egido, 1987). Consequently, tools supporting (distant) peer discussions or the negotiation of meetings might be more useful. Hence I proceed with the following proposition:

**Proposition 2:** Tool support for IS Scholars should focus on situated needs and take into account individual/dyadic contexts, practices and history of collaboration, rather than evolve around institutionalised application (e.g. in research projects).

Coordination costs for collaboration are high (Cummings & Kiesler, 2007) and collaboration can be the source of increased transaction costs, e.g. researchers might be waiting for others to comment or do their part of work (Lee & Bozeman, 2005). Examples from the interviews show that Social Software can help reduce coordination costs (see example in section 3.3). Skype can provide awareness on the availability of collaborators. Such awareness is very important, especially in reducing risk and coordination costs (Carroll, Rosson, Farooq, & Xiao, 2009). In the interviews awareness was mentioned as problematic multiple times, in that not only synchronous, but even more so asynchronous awareness seems to be problematic. Where Skype can provide some form of synchronous awareness, only very few tools offer asynchronous awareness, e.g. visibility on work progress. Dropbox was especially mentioned in offering a simple form of asynchronous awareness that individuals do not need to trigger, as is the case with email. For example, a user can save a new version of a paper and the collaborator gets notified automatically that the file was changed and when. By using a suitable naming scheme additional awareness is created regarding who edited the document last. In general, awareness seems to be a key issue in the collaborative efforts described by the participants. This leads to the following proposition:

**Proposition 2a:** Social Software tools reduce coordination costs in creating synchronous (e.g. Skype) and asynchronous (e.g. Dropbox) forms of awareness.

Moreover, awareness regarding the structure of one’s social network was perceived as helpful by the participants. In contrast to enterprise contexts, work groups are not formed inside a hierarchy (e.g. triggered by delegation) but have to form in a market situation (initiated by the future collaborators) and hence need to build on knowledge regarding potential collaborators. Anecdotal evidence, reports on Networks of Excellences (Bonaccorsi et al., 2008), and scientific collaboration networks in general
(Barber, Krueger, Krueger, & Roediger-Schluga, 2006) as well as the prevalent strong influence of proximity in scientific research (Ponds et al., 2007) indicate that a wider social network between scholars does not yet exist. This is especially problematic for Ph.D. and post-doctoral students, as this group does not yet have an established social network of potential collaborators and hence depends strongly on mediation (cf. proposition 1). Social Network Sites (SNSs) have proven in other context that they can facilitate knowledge on the structure of a social network and the individuals embedded in it (Richter et al., 2010; Steinfield, DiMicco, Ellison, & Lampe, 2009). Beyond that SNSs offer the functionality to search for individuals on a targeted basis, as can already be observed in the practices of recruiting companies (Thew, 2008). Further on SNSs are widely used for the management of weak ties (Schaefer, 2008; vom Brocke, Richter, & Riemer, 2009) and with that the maintenance of structural knowledge on individuals embedded within the social network. SNSs are used by the majority of the participants. All their actions aim at creating or maintaining structural knowledge concerning their professional social network. SNSs are used for managing weak ties, finding reviewers, staying up to date (especially in the context of communities) and signalling belongingness to a certain group. Above that concerning the management of weak ties those participants that did not use SNSs stated that managing weak ties is problematic. In contrast none of the SNS users did. I summarise my observations with the following proposition:

**Proposition 2b:** Social Network Sites can facilitate awareness regarding the structure of the social network a scholar is embedded in, thereby improving the ability to act in this social network.

In accordance with the findings of Kraut (1987), I observed that the action of “writing a paper” is mainly executed alone and collaboration takes place asynchronously. But certain research steps warrant the attention of multiple scholars. This can be illustrated by the example of qualitative coding, as explained by one of the participants. In order to reduce bias, multiple scholars should be involved in the creation of codes (Klein & Myers, 1999). When the codes are created by working alone and only compared by means of a phone call, however, errors can occur, e.g. by choosing different wordings. Therefore it can be beneficial to collaborate face-to-face in order to generate the initial codes. In the mentioned case Google apps was used, as a face-to-face interaction was not possible due to distance. Such synchronous support is to date underrepresented in literature, despite its high potential in the context of paper writing and qualitative data analysis. This leads to my last proposition:

**Proposition 2c:** Online working environments supporting synchronous collaboration like Google docs are beneficial in textual activities such as qualitative data analysis, interpretation and paper writing.

## 5 CONCLUSION AND OUTLOOK

I presented findings from a qualitative study investigating the nature of collaboration in academic research with a distinct focus on individual scholars, a perspective largely overlooked in extant research so far. In doing so, my contribution is twofold. Firstly, I elicited a rich picture of scholarly collaboration by distinguishing 1) different groups of scholars, 2) their various collaboration contexts, as well as 3) how these contexts change over a time, as scholars progress in their careers. Secondly, and based on the first contribution, I investigated tool support for the research collaborations portrayed in the first step, which revealed that tool choice emerges in dyads, but rarely at the wider group or project level. My findings are subsumed in two sets of propositions on research collaboration in the IS discipline. The research presented here is the first step in a three-step process. In the next two steps I want to further refine my observations by guided interviews and then test the propositions by means of a survey. I am aware of the limitations in that the current study is constrained due to its sample size. However I think that my preliminary propositions should be interesting to other scholars, and may be used as a starting point for further research. Moreover I want to highlight the benefits of analysing research collaboration in taking a perspective focusing on the individual scholar and not on the macro level. The limited data sample, however, might have induced problems concerning my observations that need to be acknowledged. Besides the obvious limitations with regards to generalisation, I need to acknowledge that my descriptions of tool usage are only anecdotal and exemplary, as other scholars might have derived practices of using other tools such as Wikis and
Blogs. Even though the participants did not mention to utilise such tools to any notable extent they might still be widely used. Concluding I hope that the presented study might motivate others to take the perspective of individual scholars in analysing research collaboration and potentially utilise my preliminary propositions as a starting point.
References


