

Tools and practices for open research collaboration

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ABSTRACT

Digitalization and internet have changed academic practices, such as publishing and publicity of research results, but also the ways academics work and collaborate.

This paper presents a new type of open research collaboration, as conducted by the SOMUS research project, for discussion and further development. In this paper we describe and evaluate the tools and practices of this ongoing research project. It should be noted that we mainly discuss research practices of project management and teamwork, while particular research methods such as data gathering and analysis are excluded. This viewpoint is chosen since we have found the project management as the key issue in developing open research practices.

Besides describing our practices and tools we point out some possibilities and challenges they create. We have found open research collaboration to be interesting and beneficial from the researchers' point of view. At the same time, openness creates tension between our way of working and traditional academic processes.

Keywords

Open research, open science, social media, research management methodology, scientific collaboration, distributed teamwork, academic practices.

1. INTRODUCTION

SOMUS (Social media for citizens and public sector collaboration) project is a multidisciplinary project funded by the Academy of Finland for 2009-2010. One of the goals of the project is to enhance dialogue between citizens and the public sector. By stating this goal, the project enlists in public service, meaning that it not only shares the expertise and knowledge produced by the research but also takes an active role by trying to understand, facilitate and develop technical tools for emerging forms of citizenship.¹

The SOMUS project is also committed to creating and validating a model for open internet-based research. Hence, we are representing ourselves here as a case study of research

conducted openly on the internet. This paper reflects our practices and presents our approach for critical evaluation.²

First, we present the SOMUS project and its connection to the Open Research Swarm, an example of open research in social media environment. Second, we discuss our key principles for collaboration: openness, deliberation, and agility, and present our collaboration tools and practices. Finally, we analyze open research in connection to the societal goals of the SOMUS project, and contemplate the preconditions, benefits, and challenges of open research group work.

2. BACKGROUND

SOMUS unites research organizations from various disciplines, such as communication research, sociology, media technology and computer science. Each organization has 1-2 full-time equivalent researchers involved at a time. University of Tampere researches citizen participation and processes of collective knowledge formation in media. VTT, Technical Research Centre of Finland, focuses on social media services for special citizen groups (e.g. immigrants) and open participatory design empowering communities. University of Jyväskylä researches the phenomena of self-organizing media networks in extraordinary situations. Helsinki University of Technology develops innovative services and mashup creation tools for end-users and analyses potential business models of the piloted services.

The consortium in SOMUS also includes the Open Research Swarm, a self-organizing group of researchers who collaborate mainly over the Internet and utilize social media tools in research work. The Open Research Swarm is not an official organisation but can be thought of as a freelancer researcher network that operates openly. It has its own budget share, which allows the SOMUS project to utilize the expertise of external researchers for short periods of time, for very specific tasks that add value. One of the goals of SOMUS is to define and validate a model for utilizing and involving the Open Research Swarm in future research projects.

¹ The objectives of the project are described in detail at <http://tutkimus.parvi.fi/index.php/Somus-final>.

² Our research practices and use of social media tools are currently also studied by VISCI research project (Virtual Intelligent Space for Collaborative Innovation) at http://www.cicero.fi/sivut2/projects_VISCI.html.

3. OPENNESS, DELIBERATION AND AGILITY

SOMUS incorporates elements of open science [1] in research processes and project management. While an ideological choice, it may also be considered as a generation gap example, with researchers believing in a “you are what you share” paradigm [2]. Cottey has described this type of ideology as radical and lacking defined protocol or criteria, and still a long way from reaching mainstream academic science practices [3].

The SOMUS project plan was originally created by the Open Research Swarm in a project Wiki³ which was later chosen as the main working platform for written artifact. Wiki promotes the transparency: all research processes, meeting agendas and minutes with the decisions made are available for viewing, commenting - and criticizing.

In SOMUS, openness as a practice means not only the publicity of the research processes but also inclusiveness of the research. Our collaboration can be characterized as deliberative and agile - new ideas are welcome from anyone in our networks or from the Open Research Swarm. In addition to using these principles in our participatory, user-community driven design and software development tasks, we allow redefinition and reprioritization of the research in practically all our tasks, constantly but in a managed way. This is suggested in literature as a cognitively natural way for solving wicked problems [4].

4. OPEN COLLABORATION PRACTICES

Since SOMUS researchers are geographically dispersed, using internet-based collaboration tools is a practical necessity. However, the research group is also aiming for other benefits, such as continuous communication with the research community. Project management, coordination of activities and communication are implemented in SOMUS by various publicly available tools.

SOMUS uses *Qaiku*,⁴ a *microblogging service*, for asynchronous reporting of meetings and seminars. Unlike Twitter, Qaiku allows discussion threads.

*Etherpad*⁵ is a *browser-based real-time collaborative text editor*, used for brainstorming, planning and article writing. *Skype* is a *VoIP communication tool*, for weekly real-time meetings between distributed team members and other parties.

Wiki is used for “formal” documentation of project meetings, ideas and articles. *Email* is used primarily for issues irrelevant to members outside the project group. Official *face-to-face project meetings* are held only once every six months to evaluate and reflect on progress and define key goals and direction for the next period.

In addition, we use blogs (WordPress) and social bookmarking (Delicious) for informal sharing, and other tools (Owela weblab⁶, UserVoice⁷) for interacting with user communities.

We have used open tools and methods in the following **processes and actions**:

Open planning. Since the conception of the project, planning has been done openly. Wiki is used as the main tool for documenting our project and subproject plans. Ideation of project tasks is typically done in Qaiku, EtherPad or other tools, which we consider to be faster, more open, more efficient, and more convenient than e-mail.

Open meetings. Project meetings are open, meaning that we inform about all kinds of meetings beforehand in internet forums like Wiki and Qaiku. Though we use Skype (a closed tool) for voice discussion, outsiders can participate this way as well. We produce project meeting artefacts during the meetings by writing the meeting memo in the project Wiki and at the same time microblogging about the meeting in Qaiku threads on a public #somus channel.

Open article writing. SOMUS has been writing articles using the Wiki as our main tool. We have wanted to provide an opportunity for interested writers but also to give a chance for external contributors to give instant feedback – helping us improve the quality of our work.

When planning articles, we have used “*real-time audiovisual collaborative text editing*” by means of Skype (for voice and e.g. link or emotion exchange) and EtherPad (text editing, with chat). However, we have not yet been able to avoid using desktop word editor software for the finalization of the articles.

Open software development. We involve users, developers, stakeholders and other interested parties in the open development process of our pilot services. At first, workshops and groups discussions are held together with these groups to capture initial needs and findings. During development, software versions are released frequently, after iterations of 2-4 weeks. Feature requests and bug reports are gathered using UserVoice and Owela, and this input is the key element in scope definition and prioritization for next iterations

Open communication. Qaiku is the main tool for our online discussions. Even many sensitive issues like funding are

³ [Http://tutkimus.parvi.fi/index.php/Somus](http://tutkimus.parvi.fi/index.php/Somus).

⁴ [Http://www.qaiku.com](http://www.qaiku.com). Currently over 100 followers on the #somus channel.

⁵ [Http://www.etherpad.com](http://www.etherpad.com)

⁶ [Http://owela.vtt.fi](http://owela.vtt.fi)

⁷ [Http://www.uservoice.com](http://www.uservoice.com)

discussed openly. We are, in a way, constantly crowdsourcing ideas, hints, links, opinions and other microcontributions.

Open participation in research. As shown, we invite anyone to participate and contribute. Participation is done by non-project personnel and often without monetary compensation but also by means of a microfunding mechanism⁸ (in the form of the Open Research Swarm budget).

By means of these practices in open collaboration we are ultimately aiming towards transparency – and effectively a holistic way of working, where anyone can potentially observe others' activities [1].

5. OPEN RESEARCH GROUP WORK

SOMUS researchers' active role in participating in the research process and publicly expressed aims of developing the state of affairs in the society are familiar to action research [5].

The SOMUS researchers are committed to trying out new social media tools, joining discussions, collaborating with user groups and the public sector, and engaging in activities outside the original project plan. Despite being demanding and time-taking, this has also led to networking and findings that would not have occurred in a more closed research environment.

5.1 Preconditions for open research collaboration

We have found that some of the key principles that have enabled open research are *shared values* (democracy, ethics, equality, openness of information), researchers who are *self-organized* due to motivation by shared values, permission to openly *deviate from the planned* path to investigate new ideas and some *flexible budgeted money*.

We believe that this and many other cases are supported by the concept of wicked problems: the problem in question cannot be understood so well in advance that the steps to take can be defined and planned well in advance. [4]

Our philosophy includes preferring tolerance and respect for *varying views and opinions* to a common homogenous way of thinking and emphasis on the *importance of people, networks and interaction*. We advocate *continuous co-design* of the project over a precise and structured project planning and promote *the retrospective evaluation* of our practices.

5.2 Benefits and findings of open collaboration

⁸ In 2009, about 10 000 USD were used for ORS work, for tasks ranging from few days to about one month's work, including research hypothesis and setup planning, audiovisual production, consultation, project coordination, communication and project presentations.

In general, openness in research makes research problems, ideas and results available for public scrutiny earlier than in traditional research. Disclosure of scientific problems to a group of outside participants can also be an effective means of problem solving [6]. So far in this project, outside participants have contributed by e.g. participating in discussions regarding theoretical concepts, suggesting potential research cases and challenging our research questions and service concepts.

Our approach has created enthusiasm among us researchers, as well as among both academic audience and our public sector contacts, in a way we have not faced in our earlier projects. Concrete examples of this include requests for visiting lectures and expert presentations at various organizations (e.g. ministries), and invitations for research collaboration.

Moreover, collaboration with our contacts and within the research group has enabled a valuable peer support. The recognition and interest from the audiences is felt as a form of gained status and reputation [7] and at the same time, it puts positive expectations on the SOMUS researchers.

Despite a geographically and organizationally distributed team there has been a lot of interpersonal communication and interaction, resulting in a high team spirit.

5.3 Challenges of open research group work

Open research is not easy. Even with a strong will to succeed, we have encountered problems especially in *tools, funding, project management, project progress reporting* and in *suitability within the traditional academic process*.

Our set of tools is constantly changing. This requires patience and constant learning. Sometimes several tools are used simultaneously, which seems to be distracting. However, with a toolset that is **not** integrated, most appropriate tools for different purposes can be selected.

The money budgeted to the Open Research Swarm is challenging within the existing academic funding system, since the Open Research Swarm is not an organized research partner. There are no clear rules for how to decide about the money since there is no formal decision-making body within the Open Research Swarm. A peer-based funding approval mechanism is in development.

As in many large consortium projects, high-level issues tend to get split up into small entities. Continuous 'swarming' sometimes makes it difficult to see the big picture. Self-organization does not always work in practical level either: even small tasks must be addressed to someone.

The value of documentation remains an issue: with open discussions and planning, finding relevant information may become more difficult. While microblogging makes documentation easy, there still is a need for summaries.

SOMUS, being funded for only two years, faces the challenge of developing research methods and conducting research at the

same time. Networking with stakeholders in the field, creating, testing, and using social media services, modeling our processes, and reaching project goals is a demanding task.

With open and swarm paradigms, it becomes increasingly difficult to specify who are actually members of a research 'team' or can this even be called a team. Likewise, it is sometimes difficult to determine who actually has contributed "sufficiently to be mentioned" as an author. This is not so much of a problem for the SOMUS project but in academic practices, for instance in academic record, ownership and authorship matter. One attempt to cope with these challenges is reporting all the outputs of the project in various formats, varying from blog posts and microarticles [1] to full length scientific articles. As the project is still in progress, we cannot yet estimate how this will fit the traditional model of Academy of Finland and academic practices in general.

6. CONCLUSION

In this paper, we have described our implementation of open research collaboration, which is based on a set of available social networking tools and more importantly, guided by key principles of openness, agility and constant deliberation. This kind of collaboration is yet quite uncommon, and we recognize the need for further development and reflective analysis.

The practices of the SOMUS project have an analogy to the agile software and product development methods. Thus we suggest that by further developing some of the described methods used in SOMUS we could indeed derive a more *defined open research methodology*, similar to Scrum [8].

Openness as a principle needs further research. Questions arise regarding the benefits of openness - is all openness desirable? On the other hand, how open, or *holoptic* can researchers be, for instance, is it sensible to share our desktops?

In open collaboration, as implemented by SOMUS, we *share all work in progress* including articles. This kind of sharing creates a potential for new kind of openness where peer commenting is expanded from the circle of closest colleagues to wider academic – and other – audiences. While in the traditional academic thinking sharing raw 'unpublished' texts is typically seen as unprofessional, we feel contrary.

The SOMUS project has gained positive attention from both academic and non-academic audience. Our policy of sharing and our politics of encouraging open data sharing in the society have been welcomed as a new and needed initiative.

We believe that the principles and practices of our presented open research collaboration are especially valuable in multi-party collaborations, like consortium projects and in developing collaboration between universities.

Being fast and flexible in producing results – even preliminary - opens up new opportunities, but benefits need to be validated by further research. The variety of our toolbox is wide, but the flexibility of our practices enables us to try and choose the best

tools for each purpose – we are not fixed to the use of certain tools. The research project is a learning process including openness for new practices, and heading towards the best practices via reflection and reconsideration.

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