NEMO
Network Models, Governance and R&D Collaboration Networks

Newsletter #7
December 2008

Collaboration in European R&D Projects

The motivations for collaboration and partner choice in EU funded R&D collaboration projects are at the heart of the workpackage 3. Within this theme, the teams from University of Surrey and ARC systems research have conducted qualitative and quantitative studies of the internal collaboration dynamics in research projects in FP5 and FP6. This newsletter represents a preview of the resulting research paper.

Introduction

The EU Framework Programmes have significantly advanced international research collaboration in Europe. Collaboration activities between R&D organisations have intensified over time, as highlighted by increasing number, size and length of joint projects. The collaboration networks have shown themselves to be highly durable, both between individual researchers and between research institutions, continuing after the initial joint projects. Yet little is known of the internal life of EU-funded R&D collaboration projects. In this paper we take a closer look at such intra-project collaboration and focus on individual projects and researchers. We look at expectations and motivations of organisations in participating in collaborative R&D projects; we study criteria for partner choice in current and future R&D projects and we look at intra-project linkages especially in terms of doing joint research.

(continued on page 2)

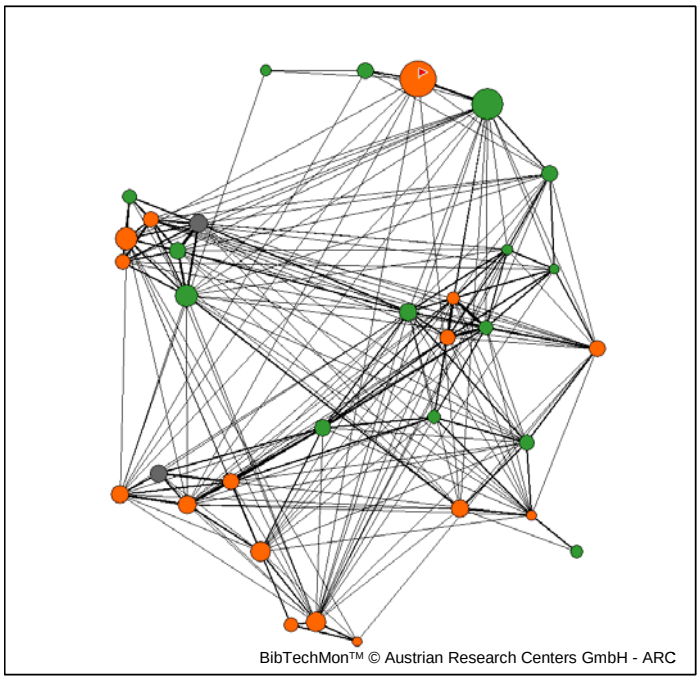

Figure 1: Example of an intra-project collaboration network within an Integrated Project in FP6 (Nokkala, Heller-Schuh et al. 2008). The nodes represent organisations, link width is related to the number of joint workpackages. Node color represents organisation type (green…universities, orange…research organisations, grey…other organisations), and node size refers to the number of workpackages involved. The red flag marks the coordinator of the project.

The NEMO Newsletter

The objective of the periodic NEMO Newsletter is to provide a platform of interdisciplinary information exchange and discourse for all sciences concerned with complex interorganisational R&D collaboration networks, and to promote the NEMO project worldwide. The Newsletter will offer regular insights into the NEMO project and document its results including previews of NEMO publications.

Other continuous features include the publication of short articles, comments on interesting links, and information about events or publications which are located in the area of our research. External contributions are welcome and should be addressed to the editor. The Newsletter is published quarterly on the NEMO website
http://www.nemo-net.eu

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THE DATA

In order to study intra- and inter-project linkages in communication and knowledge production, we draw from three different sets of quantitative and qualitative data within the Fifth and Sixth Framework Programme. Quantitative data from a representative survey among FP5 participants on the researcher level provides the broad perspective of the patterns of collaboration and joint knowledge production. This survey was conducted in 2007 as an on-line survey by the Austrian Research Centers GmbH. It yielded 1,686 valid responses, representing 3% of all relevant FP5 participants, and covering 1,089 (12% of all relevant) FP5 projects.

Two primarily qualitative datasets from the Framework Programme 6 include 22 in-depth qualitative interviews with researchers in seven projects in the EU's New and Emerging Science and Technology programme (NEST), and 15 interviews in five Integrated Projects (IP's) in three thematic areas: information society technology, sustainable development, and aerospace.

The qualitative data allows us to concentrate on the in-depth analysis of the individual collaboration paths histories, motivations for cooperation and non-cooperation with specific potential partners, and descriptions of interaction within the projects.

RESULTS

PRIOR PARTNERS PREFERRED COLLABORATORS

Our results show that the most important factor in choosing a partner is prior collaboration either within previous FP projects, national projects or other R&D activities. Favouring prior collaboration partner is based on knowing their abilities and being able to trust them to deliver required results in time. Other significant criteria for partner choice included the potential partners having required complementary expertise to that of the coordinator and other partners. Partner choice was often described to be based on recommendation by already existing project partners or trusted colleagues, or on the scientific reputation of individuals. Recommendation and reputation were mentioned as criteria especially in terms of multidisciplinary projects, where the lead partner was not familiar with the other disciplines included in the project. Organisations with similar knowledge base and history of working in similar types of projects also tended to work together. Organisations outside of dense clusters are very eager to partner with those inside cliques, and vice versa.

We observed a strong coincidence between prior contacts, current collaborative links and intended joint projects. Reliable prior contacts are frequently repeated in form of intensive R&D relations within the current project and, additionally, often taken up again in future projects. Motivations to continue working with the same partners include both aspects related to the content of the research, as well as more personal aspects. In many cases, project partners had further plans to continue with an application of the knowledge acquired in the current research project, or otherwise continue with a similar type of research with similar expertise. Sharing the intellectual property rights from the first project also necessitates cooperation in any application based on it. On the other hand, established relationships and trust, and generally successful cooperation make it "natural" to continue cooperation. Although all types of participation in EU projects seems to have favourable influence on future collaboration opportunities, the coordinators and work package leaders can especially seen as desirable partners for future collaboration. They were perceived to have greater visibility and contacts, and to possess useful experience in acquiring EU funding and steering the project. On the other hand, poorly performing partners were not invited to join future collaborations.

LEARNING AND KNOWLEDGE PRODUCTION FACILITATED BY COMMUNICATION

The key cognitive functions in FP projects are learning and knowledge production. Learning appears in three different contexts. The central aspect is content-related learning, e.g. the acquisition of a new scientific methodology, but also communication-related learning e.g. to cope with different working cultures was mentioned, which seems to be especially important in interdisciplinary collaboration. Moreover, procedural learning – how to apply and participate efficiently in EU projects with the specific rules related to applications, as well as learning reporting, risk-control, managing of international teams and coping with different organisational styles – is an important dimension of learning for the partners. Learning how to play the EU game is additionally one important aspect contributing to the desirability of former coordinators and work package leaders as partners also in future collaborations.

The most important factors enabling the effective production of knowledge in research

projects are both intensive communication among the partners and the involvement of key individuals with high visibility and reputation. Communication is most easily facilitated within small research groups, be it in small projects, or in larger projects with small sub-structures, such as formal work packages as well as informally developed collaboration structures. In a small group, communication is easier, trust between partners stronger, and working relationships more personal. Preferred project size was seen to be five to ten partners.

A well-made contract with clear task division, making an effort to manage possibly emerging problems and emphasising communication and conscious collaboration between the partners contributes to the cohesion of the project and to the willingness of partners to collaborate. Trust, teamwork, the feeling of a shared purpose and good personal relationships, also contribute to the effective cooperation and successful project.

Disciplinary and organisational backgrounds matter

In addition to project level factors, such as the size and management of the projects, we considered the perceived effects of the attributes of partners on the collaboration, such as the organisational and disciplinary background of the participants. Although the interviewees did not report the language spoken by partners or their geographical distance as significant factors in collaboration, the empirical results from the survey as well as from the Integrated Projects indicate that they still hamper collaboration in European projects. This discrepancy possibly indicates that the interviewees wish to consider these as secondary elements in collaboration, which should be based on bringing together best expertise across Europe regardless of language or geographic background.

Multidisciplinary cooperation is inspiring and enriching, although establishing a shared terminology and understanding of the research questions is challenging and time consuming, especially in projects bringing together very different disciplinary fields. Inter-organisational collaboration between different types of partners is likely to be hampered by different motivations or different institutional practises and norms, and facilitated between similar types of organisations, or organisations with similar, e.g. disciplinary, cultures. However, different dynamics were also sometimes seen as positive driving forces within the project, contributing to fruitful conflicts and forcing the partners to consider different types of perspectives and driving them to broaden the scope of outputs resulting from the project.

Research based organisations are experienced in inter-organisational collaboration and organised to enable effective cooperation with external partners. This is, in general, not the case for small companies or municipalities, which are often involved as demonstration partners. Their organisational structure is not prepared and the participation in especially large EU projects represents a significant burden in terms of paperwork and bureaucracy compared to the benefits in terms of the financial support received and the promotional value of involvement in the project.

Implications for Research and Policy

Based on these findings we are able to formulate some basic rules about collaboration patterns in EU R&D projects concerning partner choice, learning and knowledge production, and factors impeding and promoting collaboration. These rules will provide the basis for modelling realistic sub-structures and processes in such projects and will be used in the SKEIN model, an agent-based model of network dynamics developed within the NEMO project (see, e.g. NEMO Newsletter #5).

In this way, the basis for a close-to-reality simulation approach to the dynamics of politically induced R&D networks is provided. Understanding the actor-centred motivations and collaboration rules and their role in structuring the collaboration networks will help design effective and efficient incentives for network-based collaboration programmes in the future.

Reference

Nokkala T, Heller-Schuh B, Paier M, Wagner-Luptacik P (2008), Internal integration and collaboration in European R&D projects. 1st ICC Conference on Network Modelling and Economic Systems, Lisbon, Portugal, 9-11 October 2008.
Available at: http://www.listaweb.com.pt/icc/icc-nmes2008/papers/NMES_2008_Nokkala.pdf

COMMENTS AND FEEDBACK

We welcome feedback on our newsletter and work. Do not hesitate to contact us if you have ideas or comments about what you would like to see covered by the newsletter, or if you would like to write a contribution by yourself.

For further information about the project visit www.nemo-net.eu or contact the Project Co-ordinator:

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IMPRINT

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Company registration number (Firmenbuchnummer): FN 115980i
Court of registry (Sitz- und Registergericht): Wien
VAT identification number (Umsatzsteuer-ID): ATU14703506

Managing Directors:
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Owned by:
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