New Help for Science Collaboratories

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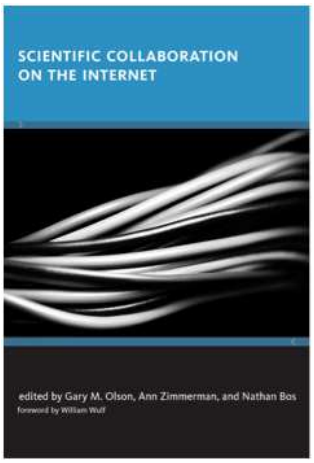

We have been studying science collaboratories for over a decade, and as part of the Science of Collaboratories project looked in great detail at the kinds of tools that have been used, and the patterns of success and failure in many different areas of science. Summaries of this work will appear shortly in our book entitled *Scientific Collaboration on the Internet* (G. Olson et al, 2008).

One key part of this effort was to develop what we call a Theory of Remote Scientific Collaboration, or TORSC (J. Olson et al, 2008). This theory, derived through a mix of bottom-up generalizations from the SOC data base of collaboratories and top-down generalizations from the research literature, summarizes a wide range of technical and social factors that differentiate successful and unsuccessful collaboratories. They are listed in the Table below.

Table 1. Factors that lead to success in Collaboratories

1. The Nature of the Work
- Participants can work somewhat **independently** from one another
- The work is **unambiguous**

2. Common Ground
- **Previous collaboration** with these people was successful
- Participants share a **common vocabulary**
  - If not, there is a dictionary
- Participants share a **common management** or working style

3. Collaboration Readiness
- The culture is naturally **collaborative**
- The goals are **aligned** in each sub-community
- Participants have a **motivation** to work together that includes mix of skills required, greater productivity, they like working together, there is something in it for everyone, NOT a mandate from the funder, the only way to get the money, asymmetries in value, etc.
- Participants **trust** each other to be reliable, produce with high quality and have their best interests at heart
- Participants have a sense of **collective efficacy** (able to complete tasks in spite of barriers)

4. Management, Planning and Decision Making
- The principals have **time** to do this work
- The distributed players can communicate with each other in **real time** more than 4 hours a day
- There is critical **mass** at each location
- There is a **point person** at each location
- A **management plan** is in place
- The **project manager** is
  - respected
  - has real PM experience
  - exhibits strong leadership qualities

Management, Planning and Decision Making, continued

- A **communication plan** is in place
- The plan has room for **reflection** and redirection
- No **legal** issues remain (e.g. IP)
- No **financial** issues remain (e.g. money is distributed to fit the work, not politics)
- A **knowledge management system** is in place
- Decision-making is free of **favoritism**
- Decisions are based on **fair and open criteria**
- Everyone has an opportunity to **influence** or challenge decisions
- Leadership sets culture, management plan and makes the collaboratory visible.

5. Technology Readiness

- Collaboration technologies provide the right functionality and are **easy to use**
- If technologies need to be built, user-centered practices are in place
- Participants are **comfortable** with the collaboration technologies
- Technologies give **benefit** to the participants
- Technologies are **reliable**
- Agreement exists among participants as to what **platform** to use
- **Networking** supports the work that needs to be done
- **Technical support** resides at each location
- An overall technical **coordinator** is in place

Special issues:

- If data sharing is one of the goals, defacto standards are in place and shared by all participants, and a plan for archiving is in place
- If instrument sharing is part of the collaboration, a plan to certify remote users is

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We have been testing this account through traditional interviews, with an interview protocol that has 54 specific questions. One of our current projects is to turn this protocol into an on-line tool we are calling the Collaboratory Success Wizard. We have a working prototype of the Wizard that is about to undergo user testing. A user of the Wizard would log on, answer the specific questions (with branching that depends on how they answer the questions), and then at the end will be given a report offering advice about what risks their actual or proposed collaboration might face. When there are risk factors, potential interventions will be offered. We see the Wizard as having two roles. On the one hand, it is an automatic way for us to gather a much wider range of data than we could through personal interviews. On the other hand, it is a way for those involved in collaborations to lower the risk of failure if they follow the advice they receive.

We continue to collect both field and lab data on the issues defined in TORSC. We very much view it as a work in progress, and its refinement and evaluation are major research thrusts for us in the near future.

We are both interested in participating in the workshop at CSCW 2008 because of our long involvement in this area of work and our eagerness to hear new ideas and data from others working in the area.

References

Olson, G.M., Zimmerman, A., & Bos, N. (Eds.) (2008) *Scientific Collaboration on the Internet*. Cambridge, MA: MIT Press.

Olson, J.S., Hofer, E.C., Bos, N., Zimmerman, A. Olson, G.M., Cooney, D., & Faniel, I. (2008). A theory of remote scientific collaboration (TORSC). In G.M. Olson, A. Zimmerman, & N. Bos (Eds.) *Scientific collaboration on the Internet*. Cambridge, MA: MIT Press.