ESF SCSS EXPLORATORY WORKSHOP

Sharing And Building Knowledge Through The Design And Development Of A Collaboratory For Library And Information Science Research And Education: Final Report

Borås, Sweden  30 January - 1 February 2006

Convened by:
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Göteborg University & University College of Borås
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Executive Summary

Background and Objectives
Increasingly, researchers, practitioners and educators need to collaborate with others across institutions and geographical distances in order to create new knowledge and educate students. Collaboratories, also referred to as community knowledge environments (Atkins, et al, 2003) and collaborative work environments (European Commission, 2006), have merged as an effective approach to sharing resources and promoting collaboration within communities. A collaboratory is defined as:

*a network-based facility and organizational entity that spans distance, supports rich and recurring human interaction oriented to a common research area, fosters contact between researchers who are both known and unknown to each other, and provides access to data sources, artefacts and tools required to accomplish research tasks.*

(Science of Collaboratories, 2003).

To date, collaboratory research has focused on supporting natural science research and engineering, with varying degrees of success and failure (Finholt, 2001; Arzberger & Finholt, 2003). There is a need to expand the focus of collaboratories to include the social sciences (Berman & Brady, 2005) in order to further increase our understanding of the relationships among social and technical factors and a collaboratory’s effectiveness, and to avoid the creation of a disciplinary digital divide.

The purpose of the workshop was to explore the design and development of a collaboratory to support information and knowledge sharing among researchers, educators, students and professionals in the social sciences, in particular the multi-disciplinary and growing area of library and information science (which includes newly formed Schools of Information, Information Studies Departments, and Schools of Library and Information Science.) The specific goals of the workshop were to identify: common challenges and needs in library and information science research and education that could be addressed by a collaboratory; solutions to these challenges and needs; and steps forward to implement the solutions, including plans to submit proposals to EU, national and/or cross-country funding opportunities to implement the solutions.

Workshop Structure
The workshop included 23 researchers from twelve countries (see List of Participants below). The participants were drawn from library and information and closely related fields. All had expertise in areas, such as information retrieval, information behaviour, information management, social informatics and collaboration, that are highly relevant for a collaboratory. In preparation for the workshop, participants were asked to read a paper synthesizing research on scientific collaboration (Sonnenwald, in press).

The workshop took place over three days, beginning the evening of day 1 and ending the afternoon of day 3 (see Final Programme below.) The workshop was highly interactive, consisting of a series of small and large group discussions (i.e., working sessions) that explored and created new ideas. Presentations were periodically included to establish workshop goals and a working understanding among the participants.

The motivation and vision for the workshop were presented at the first workshop session (evening, day 1). Because many workshop participants had not previously met, a small group exercise to enable participants to learn about each other's preferred work style and get to
know one another on a personal level was conducted. These types of activities help establish common ground among participants which is critical to successful collaborations (Olson & Olson, 2000.)

The second day of the workshop (first full day) began with a short presentation outlining the goals for the day and current research and best practices for scientific collaboratories. The presentation provided background knowledge to enable all participants to fully contribute in the day’s discussions. The first discussion identified common challenges and needs in LIS that could be addressed by a collaboratory. The participants were divided into five small groups to allow everyone to contribute to this discussion. Each small group reported it findings to the entire group. Because many challenges and needs were presented, we synthesized and prioritised the challenges and needs in a large group discussion. Next the participants broke into small groups to generate solutions for the high priority challenges and needs. Later each small group presented its findings to the entire group. Informal discussions among workshop participants continued during dinner. After dinner, Davenport and Sonnenwald synthesized the day’s discussions to create an initial framework for a collaboratory.

The third, and last, day of the workshop began with Davenport and Sonnenwald presenting the proposed framework. There was a consensus regarding the framework, and participants were divided into small groups with each small group tasked to add details to a framework component. Each group was asked to add details regarding relevant actors (stakeholders, contributors, users, developers, etc.), functions of the component, value added by the component, and scenarios of use. Each small group shared their results with the entire group. These results were discussed and next steps planned with individuals volunteering to do subsequent tasks, such as investigating funding opportunities.

**Workshop Outcomes**

During the workshop a framework for a collaboratory that builds the state of the art in scientific collaboration and information science, and addresses needs and challenges facing a social science community, in particular, the library and information science community, was developed. The framework includes a socio-technical infrastructure, actors and repository that when combined will enable new ways of working in academia and beyond. It provides an excellent foundation for one or more networks of excellence, EU integrated projects and a variety of small and large research projects. A collaborative European approach will reduce duplication of effort among member and candidate nations, more effectively capitalize on knowledge and expertise found across the EU and create the best possible solutions and help build the Europe of knowledge.

There is an opportunity now for the EU to take a world leadership role to promote knowledge creation and sharing in library and information science. Other countries, such as the USA, are beginning to consider similar efforts. If the EU does not participate or lead in this area, there is a risk that future library and information science research, education and practice could be dominated by non-EU institutions and businesses.

Furthermore, the EU can reach out to developing nations in ways other nations cannot. Knowledge sharing and creation is an important component in assisting developing nations in their efforts to eradicate poverty and oppression. The collaboratory projects that will emerge from this workshop can transcend EU boundaries to facilitate knowledge sharing in developing nations.
Scientific Content
Results of the intense interactive discussions during the workshop are summarized in the following sections. In particular, the needs and challenges for a collaboratory, a framework that provides a socio-technical foundation for a collaboratory, and a future scenario of use for the proposed collaboratory are provided.

Needs and Challenges for a Collaboratory in Library and Information Science

As a discipline and profession, library and information science plays a critical role in the discovery of knowledge. It is a multi-disciplinary discipline and profession that includes research and education in: organization of information (meta-data, thesaurus construction, abstracting); information retrieval; human information behaviour; bibliometrics; information and library services; library management; collaboration and knowledge management; information policy; archival science; digital libraries; social informatics; and academic, public, children and special libraries. It has longed played a valuable role in education and democracy, cultural heritage and more recently economic development. For example, a recent study conducted in Florida, USA shows that public libraries' return on investment in Florida is approximately 6.5 to 1; for every $1.00 spent in public support of public libraries, a return of $6.54 was seen in terms of gross regional product and time and money saved (Griffiths, King, Lynch, & Harrington, 2005). It includes newly formed Schools of Information, Information Studies Departments, and Schools of Library and Information Science.

Yet the government research funding agencies in many countries do not support library and information science research to the same degree as other fields. In many countries the relevant departments are small in terms of faculty. For example, the Department of Information Studies at the University of Oulu (Finland) has 3 full-time faculty. This situation is mirrored in professional practice where many libraries and information professionals are the only LIS professional in their organization and/or geographical area. At the workshop, the consensus among participants was that the LIS discipline suffers from a lack of critical mass at many institutions, low visibility, fragmentation within the discipline, and low funding. Yet there is much creative potential within the discipline.

Thus, there is a real need for a collaboratory to support research and higher education in this field. Current needs within the discipline are both internal and external in nature. That is, the discipline could benefit from more collaborative problem solving, information sharing and knowledge creation related to education, research, professional practice and changes in society more broadly within the discipline and with those outside the discipline. This includes addressing issues such as: institutional versus personal access to information; universality of information skills; distance versus local learning; opinion and attitudinal change and other overarching issues; management of societal, institutional and organizational knowledge, and, migration to the Bologna model of higher education.

Previous experiences in establishing and maintaining collaboratories show that a number of social and technical challenges are critical to their success (Arzberger & Finholt, 2003; Sonnenwald, Whitton & Maglaughlin, 2003; Science of Collaboratories, 2005). These challenges include: strong visionary goals (Sonnenwald, 2003); meaningful recognition for contributions (Arzberger & Finholt, 2003); trust among participants (Finholt, 2001; Sonnenwald, 2003); a good match between the technology and users' values (Orlikowski, 1993); need for new information organization and human-information interaction methods.
(Arzberger & Finholt, 2003); and, improvement over the current way of working (Sonnenwald et al, 2003).

Additional challenges identified by the workshop participants included: language diversity; cultural diversity; time constraints; lack of uniform access to existing and emerging technology; basic inequalities in programmes and institutions (including financial inequalities); socio-cultural origins of the discipline; different intellectual property rules and regulations across institutions and countries; meeting the needs of a variety of stakeholders and users; challenges in growing a collaboratory (community ownership); difficulty of measuring outputs of scholarship; ethical issues regarding sharing information and data; and different national programmes for archiving content. These challenges are not insurmountable but rather factors we need to take into consideration when designing a collaboratory.

![Figure 1. Framework for LIS Collaboratory](image)

**Collaboratory Framework**

The framework developed at the workshop for a collaboratory (Figure 1) includes three overlapping components: a socio-technical infrastructure, actors, and a repository. Previous research (e.g., Sonnenwald, in press) has shown that it is not sufficient to have only a technical infrastructure for a collaboratory; a social infrastructure is also required. The socio-technical infrastructure will provide mechanisms to support the rights, responsibilities and activities of actors. This would include an organizational or management structure, research and business plans, guidelines regarding partnerships with other organizations, intellectual property policy, reward mechanisms, and research and business plans and vision to develop and sustain the collaboratory.

Collaboratory actors will: set policies; design, build and maintain the collaboratory; contribute resources to the collaboratory; use collaboratory resources; and evaluate its strengths and weaknesses and identify ways to improve the collaboratory. The term, actors, includes both individuals and organizations. Individuals can be researchers, teachers at all levels of education, students and other learners, and practitioners including librarians, other information professionals, journalists and policy makers. Of course, an individual may
assume one or more of these roles and identities at different times. Organizations may include university departments, research institutes, funding agencies, businesses, public institutions, communities, government agencies, and non-profit organizations. It is important to recognize that actors will also have other activities and responsibilities outside the collaboratory.

The collaboratory’s repository will be designed, built and maintained within the socio-technical infrastructure. That is, the socio-technical infrastructure will provide policies and tools to manage and access repository content. It can be difficult and perhaps counter-productive to exhaustively distinguish between what is infrastructure and what is a repository. For example, should the database that manages content be considered part of the repository or part of collaboratory infrastructure? Thus the repository and socio-technical infrastructure are shown as overlapping boxes in Figure 1. The repository may not be one physical entity or database but rather multiple collections of content. It may also utilize repositories external to the collaboratory, and allow external repositories to access it. An example of an external repository accessing another repository is Google Scholar scanning and using content in the ACM Digital Library to add to Google Scholar’s citation and publication repository.

Combined, the socio-technical infrastructure, actors and repository should ideally provide added value to actors. One potential value of the collaboratory could be the integration of disciplinary knowledge, helping to inform those within the discipline and in other disciplines. Value added should be measured when possible using quantitative and qualitative data. Such measures might range from citations of repository content to stories highlighting impact on individuals and their research projects or learning.

A synthesis of workshop discussions during the second day identified six possible work packages or components of the collaboratory socio-technical infrastructure and repository that could, or should, be developed to provide added value. The six are: collaboratory management, process support tools (including mapping mechanisms, collaboration process mechanisms, and research process mechanisms), transformation process mechanisms, knowledge architecture, evaluation, and dissemination and exploitation.

**Collaboratory Scenario**

Following is one scenario developed by workshop participants to illustrate the potential of a LIS collaboratory.

1) Maria is researcher at the National Laboratory for Engineering Technology and Innovation in Portugal. She is aware of a virtual community of people in the information field that she has joined sometime ago, but for lack of time or else, she never had the chance participate. She heard about an international Collaboratory created by this community, but she did not know exactly what it was about.

2) Today she faces a problem: she has an urgent need to use a software tool (a stats package for the social sciences), to finish the analysis of data related to a project. She consults the “virtual lab”, the internal system that lists all the tools and resources available in the Laboratory but, not surprisingly, among the long list of resources covering the main research areas of the Laboratory, she could not find the
software that only a small team in the institution is interested in. The possibilities to find someone to get advice from were also limited, if at all existing.

3) In search of a solution, she remembers the Collaboratory: “Hmm, perhaps there is something there”. To her surprise she found:

- A section in the portal with a variety of software tools available for download (with all copy rights cleared)
- A pool of experts she can contact and ask to meet in the chat room and advice on specific issues
- A section on research methods and tools
- A section on “how to prepare proposals and to apply to different Research Funding bodies”
- A discussion forum, were she found track of previous discussions related to the subject she was working on.
- A variety of databases with selected “quality content”
- A repository of Survey data in a variety of fields, topics and environments
- Ongoing Research projects

4) After a few minutes to half an hour of exploration or so, she not only got the tool she needed but also discovered other researchers doing similar projects with whom she will discuss some issues and maybe, in the near future, will establish a partnership for future projects, or she might expand her research topic to include a comparative analysis using available data on the Collaboratory repository?

5) Still very excited she wonders:

“Who makes this possible? Behind there must be some kind of cooperative organizational structure, an international consortium? How is it sustained?”

“How can I contribute and become a full participant member in the future? What can I offer?”

References


Assessment of the Results

Our vision is that a collaboratory in the field of library and information science can provide an excellent foundation for one or more networks of excellence, EU integrated projects and equivalent research projects, and a variety of small and large projects and work tasks in the future. For example, we could start with the workshop participants’ knowledge, activities, data, networks and existing research projects, and expand it as soon as possible to include others. Several participants said they had projects they could volunteer to use the collaboratory. This approach was preferred among the workshop participants. Thus, rather than explicitly specifying one or two new projects that the collaboratory would support, we focused on developing the framework needed for a collaboratory to support a variety of already exiting and future projects and work tasks.

A date for a second workshop this fall was established, and several participants volunteered to locate funding to support the workshop. Participants also volunteered to investigate various funding opportunities and technology to help us continue working together and develop grant proposals. Mechanisms for sharing information on an ongoing basis were established. These have since been implemented and are in use.

In sum, good progress was made at the workshop and there is a commitment to work towards establishing an innovative library and information science collaboratory. Comments from workshop participants explain:

This workshop...has been a huge success on many levels...I came home inspired about the potential of our collaboratory as well as about possible research partnerships with others.

We accomplished a great deal in a very short time.

The word "collaboratory" meant nearly nothing to me one week before I went to Borås, and now I regard it as part of me and my future and present plans- I'm ready to work for it.

This workshop is the beginning of a long term, effective and rewarding co-operation that increases synergy within our field of science.

The group as a whole fairly quickly arrived at a mutual understanding about the needs and challenges for the collaboratory...This could indeed be something of a model that many other fields also could use. There was a vision about the role and nature of... [our field that strike] me as being visionary and something that will really help the field move forward. The compass was set to point the way ahead in a way that I've never read or witnessed anywhere before.
Final Programme

Monday 30 January 2006: Establishing Common Ground

**Afternoon**

17:00-17:45  
**Arrival**  
Welcome, workshop motivation & vision, introductions  
D. Sonnenwald  
Welcome from the President, University College of Borås  
L. Nordholm  
**Presentation of the European Science Foundation (ESF)**  
(Standing Committee for the Social Sciences)  
I. Vonesch

17:45-18:45  
Small group exercises to learn about each other’s work style preferences  
All

18:45-20:45  
**Dinner**  
All

Tuesday 31 January 2006: Identifying Common Challenges and Potential Solutions

09:00-09:15  
**Agenda & goals for the day**  
D. Sonnenwald

09:15-09:45  
Issues in scientific collaboration across distances  
D. Sonnenwald

09:45-11:00  
Identification of common challenges & needs that could be addressed by a collaboratory  
Small group discussions  
(5 groups of 4-5 each)

11:00-11:30  
**Break**  
All

11:30-12:30  
Presentation & discussion of small group results  
Presentation by each small group

12:30-13:45  
**Lunch**  
All

13:45-14:30  
Synthesis & prioritization of common challenges & needs  
Group discussion facilitated by D. Sonnenwald

14:30-14:45  
**Break**  
All

14:45-16:00  
Identification of solutions for prioritized challenges & needs  
Small group discussions  
(5 groups of 4-5 each)

16:00-16:30  
**Break**  
All

16:30-17:30  
Presentation & discussion of small group results  
Presentation by each small group

18:30-20:30  
**Dinner**  
All
**Wednesday 1 February 2006: Working towards solutions: Development of a Collaboratory Project**

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter/Leader</th>
</tr>
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<tbody>
<tr>
<td>09:00-09:15</td>
<td>Agenda &amp; goals for the day</td>
<td>D. Sonnenwald</td>
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<tr>
<td>09:30-10:15</td>
<td>Synthesis of previous discussions: Proposed collaboratory framework</td>
<td>Presentation &amp; discussion lead by E. Davenport</td>
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<td>10:15-11:15</td>
<td>Further development of each framework component</td>
<td>Small group discussions; each group focusing on a project component</td>
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<td>11:15-11:30</td>
<td><em>Break</em></td>
<td>All</td>
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<tr>
<td>11:30-12:30</td>
<td>Presentation &amp; discussion of small group results</td>
<td>Presentation by each small group</td>
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<tr>
<td>12:30-13:45</td>
<td><em>Lunch</em></td>
<td>All</td>
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<td>13:45-onwards</td>
<td>Planning next steps</td>
<td>All</td>
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<tr>
<td>Evening</td>
<td><em>Departure</em></td>
<td>All</td>
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Statistics regarding Workshop Participation

Workshop Participation by Gender

- Females: 74%
- Males: 26%

Workshop participation by Years of Professional Experience (YPE)

- 4-10 YPE: 22%
- 11-17 YPE: 35%
- 18+ YPE: 17%
- Ph.D. Students & 1-3 YPE: 26%
- 11-17 YPE: 35%
- 4-10 YPE: 22%
Workshop Participation by Country

Number of Participants from Each Country

- Czech Republic: 1
- Finland: 3
- Ireland: 2
- Lithuania: 2
- Portugal: 1
- Slovak Republic: 1
- Slovenia: 2
- Spain: 1
- Sweden: 5
- Taiwan: 1
- UK: 3
- USA: 1
List of Workshop Participants

In alphabetical order by country:

Czech Republic
Jakub Lesikar
Ph.D. Student
Institute of Information Studies & Librarianship
Charles University
Areas of expertise: information retrieval, internet, competitive intelligence

Finland
Mariam Ginman
Professor
Department of Social and Political Sciences
Abo Academy University
Areas of expertise: social capital, knowledge management
Year dissertation was completed: 1983

Maija-Leena Huotari
Professor
Department of Information Studies
University of Oulu
Areas of expertise: information seeking, organizational behaviour
Year dissertation was completed: 1996

Sanna Talja
Lecturer
Department of Information Studies
University of Tampere
Areas of expertise: scholarly communities, digital libraries, collaboration
Year dissertation was completed: 1998

Ireland
Mary Burke
Professor
Head of Department
School of Information and Library Studies
University College of Dublin
Areas of expertise: information retrieval of visual images, digital libraries
Year dissertation was completed: 1974

Crystal Fulton
College lecturer
School of Information and Library Studies
University College of Dublin
Areas of expertise: information seeking, needs and use
Year dissertation was completed: 1999
**Lithuania**

**Elena Macevičiūtė**  
Professor  
Faculty of Communication  
Vilnius University  
Areas of expertise: multi-cultural organizations; information management  
Year dissertation was completed: 1992

**Zinaida Manzuch**  
Ph.D. student  
Library and Information Science Institute  
Faculty of Communication  
Vilnius University  
Areas of expertise: digitalisation of cultural heritage, EU cultural heritage policy  
Year dissertation completion is expected: 2007

**Portugal**

**Maria Joaquina Barrulas**  
Scientific researcher  
Department director  
INETI- Instituto Nacional de Engenharia e Tecnologia Industrial  
Areas of expertise: digital libraries, information management, education  
Year dissertation was completed: 1993

**Slovak Republic**

**Jela Steinerová**  
Associate Professor  
Department of Library and Information Science  
Comenius University  
Areas of expertise: information retrieval, knowledge organization  
Year dissertation was completed: 1992

**Slovenia**

**Alenka Šauperl**  
Associate Professor  
Department of Library and Information Science and Book Studies  
Faculty of Arts, University of Ljubljana  
Areas of expertise: classification, cataloguing, meta-data  
Year dissertation was completed: 1999

**Polona Vilar**  
Assistant Professor  
Department of Library and Information Science and Book Studies  
Faculty of Arts, University of Ljubljana  
Areas of expertise: information seeking behaviour, human-computer interaction  
Dissertation completion expected: 2006
Spain
Piedad Fernández Toledo
Senior lecturer
Departamento de Filología Inglesa
Facultad de Comunicación y Documentación, Campus de Espinardo
Universidad de Murcia
Areas of expertise: discourse analysis, learning
Year dissertation was completed: 2000

Sweden
Ann-Sofie Axelsson
Ph.D.
School of Technology Management & Economics
Chalmers Institute of Technology
Areas of expertise: communication, human-computer interaction
Year dissertation was completed: 2004

Olov Forsgren
Professor
School of Business and Informatics
University College of Borås
Areas of expertise: co-design processes and tools
Year dissertation was completed: 1988

Preben Hansen
Researcher
Swedish Institute of Computer Science
Areas of expertise: collaborative information seeking and retrieval, contextual IS&R, cross-language information retrieval, human-computer interaction
Year dissertation completed: 2006 (expected)

Diane Sonnenwald
Professor
Swedish School of Library and Information Science
Göteborg University and University College of Borås
Areas of expertise: collaboration, collaboratory design and evaluation
Year dissertation was completed: 1993

Maria Spante
Ph.D. Student
School of Technology Management & Economics
Chalmers Institute of Technology
Areas of expertise: virtual reality, human-computer interaction
Maria has graciously agreed to assist during the workshop, taking notes, etc.

Taiwan
Mei-Mei Wu
Professor
Graduate Institute of Library & Information Studies
National Taiwan Normal University
UK

Elisabeth Davenport
Professor
School of Computing
Napier University, Edinburgh, Scotland
Areas of expertise: social informatics, knowledge management
Year dissertation was completed: 1994

Ralph Schroeder
Research fellow
Oxford Internet Institute
Oxford University
Areas of expertise: collaboration in virtual environments
Year dissertation was completed: 1988

Tom Wilson
Professor Emeritus, University of Sheffield
Visiting Professor, Leeds University Business School and Swedish School of Librarianship and Information Science
Areas of expertise: information seeking behaviour, information needs, information system strategies, information service evaluation, mobile information systems, open access publishing
Year dissertation was completed: 1975

USA

Umesh Thakkar
Senior research scientist
National Center for Supercomputing Applications
Beckman Institute for Advanced Science and Technology
University of Illinois at Urbana-Champaign
(Formerly at the National Science Foundation)
Areas of expertise: learning technologies, collaboratories in education, technology evaluation
Year dissertation was completed: 1993