

European Science Foundation
Standing Committee for the Social Sciences (SCSS)

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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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 laboratories. 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 laboratory. The participants were divided into five small groups to allow everyone to contribute to this discussion. Each small group reported its findings to the entire group. Because many challenges and needs were presented, we synthesized and prioritized 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 laboratory.

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 laboratory 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 laboratory 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 long 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.

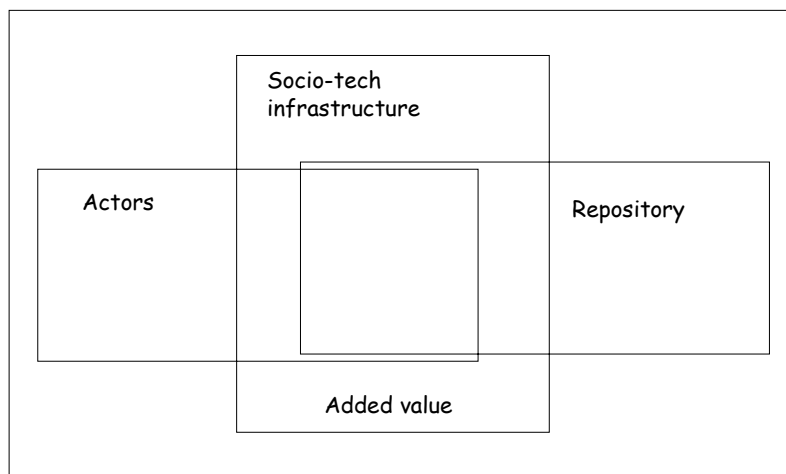


Figure 1. Framework for LIS Collaboratory

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, where 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

- Arzberger, P. & Finholt, T. (2003). Data and collaboratories in the biomedical community: Report of a panel of experts meeting. Washington, DC: National Institutes of Health.
- Atkins, D.E., Droegemeier, K.K., Feldman, S.I., Garcia-Molina, H., Klein, M.L., Messerschmitt, D.G., Messina, P., Ostriker, J.P., & Wright, M.H. (2003). *Final Report of the NSF Blue Ribbon Advisory Panel on Cyberinfrastructure: Revolutionizing Science and Engineering Through Cyberinfrastructure*. Retrieved June 14, 2005 from <http://www.cise.nsf.gov/evnt/reports/toc.htm>.
- Berman, F., & Brady, H. (2005). Final report: NSF SBE-CISE workshop on cyberinfrastructure and the social sciences. Retrieved May 19, 2005 from <http://www.sdsc.edu/sbe>.
- European Commission, New Working Environment Unit (2006). http://europa.eu.int/information_society/activities/atwork/index_en.htm
- Finholt, T. (2001). Collaboratories, In B. Cronin (Ed.) *Annual Review of Information Science and Technology* (pp. 73-108). Washington, DC: ASIS&T.

- Griffiths, J., King, D., Lynch, T., Harrington, J. (2005). Taxpayer return on investment in Florida public libraries: Summary Report. Downloaded 18 April 2005 from:
<http://ddlis.dos.state.fl.us/bid/roi/pdfs/ROISummaryReport.pdf>
- Olson, GM, & Olson, JS. (2000). Distance matters. *Human-Computer Interaction*. 15 (2-3), 139-178.
- Science of Collaboratories (2003). Workshop on the social underpinnings of collaboration: Final summary. Retrieved June 14, 2005 from
<http://www.scienceofcollaboratories.org/Workshops/WorkshopJune42001/index.php?FinalSummary>
- Sonnenwald, D.H. (in press). Scientific collaboration: Challenges and solutions. In B. Cronin (Ed), *Annual Review of Information Science & Technology (ARIST)*. Medford, NJ: Information Today.

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 existing 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	<i>Arrival</i>	
17:00-17:45	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	<i>Dinner</i>	All

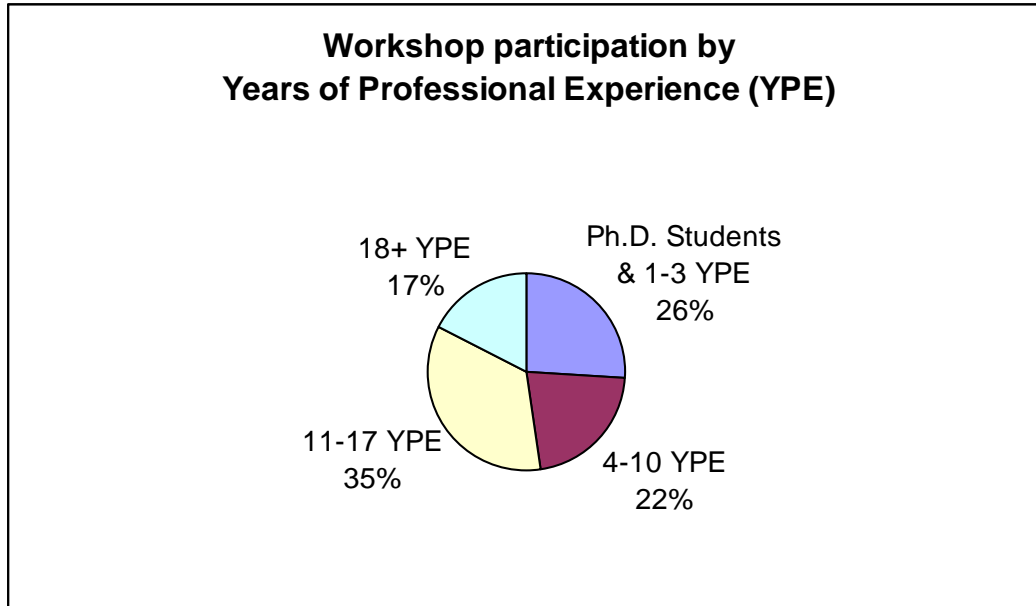
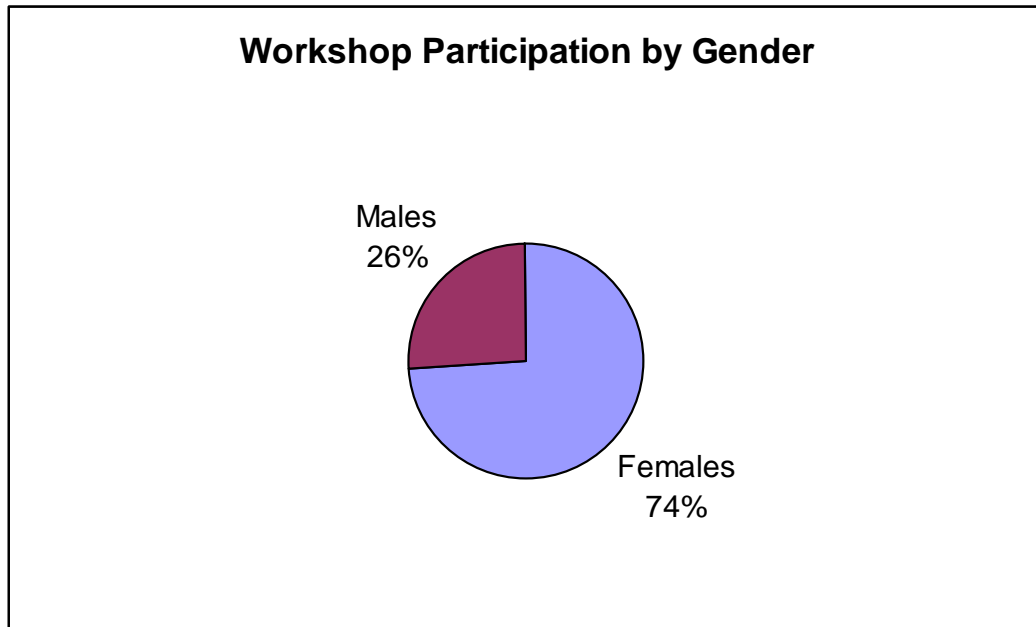
Tuesday 31 January 2006: Identifying Common Challenges and Potential Solutions

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 collaborative	Small group discussions (5 groups of 4-5 each)
11:00-11:30	<i>Break</i>	All
11:30-12:30	Presentation & discussion of small group results	Presentation by each small group
12:30-13:45	<i>Lunch</i>	All
13:45-14:30	Synthesis & prioritization of common challenges & needs	Group discussion facilitated by D. Sonnenwald
14:30-14:45	<i>Break</i>	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	<i>Break</i>	All
16:30-17:30	Presentation & discussion of small group results	Presentation by each small group
18:30-20:30	<i>Dinner</i>	All

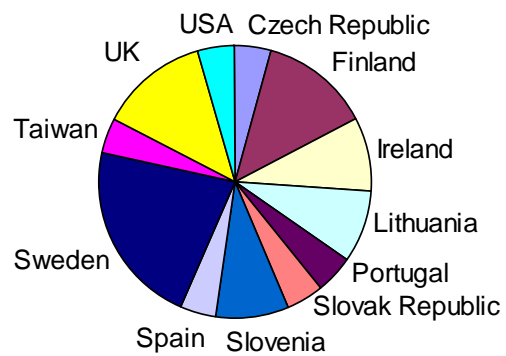
Wednesday 1 February 2006: Working towards solutions: Development of a Collaboratory Project

09:00-09:15	Agenda & goals for the day	D. Sonnenwald
09:30-10:15	Synthesis of previous discussions: Proposed collaboratory framework	Presentation & discussion lead by E. Davenport
10:15-11:15	Further development of each framework component	Small group discussions ; each group focusing on a project component
11:15-11:30	<i>Break</i>	All
11:30-12:30	Presentation & discussion of small group results	Presentation by each small group
12:30-13:45	<i>Lunch</i>	All
13:45-onwards	Planning next steps	All
Evening	<i>Departure</i>	

Statistics regarding Workshop Participation



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, collaborative 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

Areas of expertise: elicitation behaviour during information retrieval interaction, e-learning
Year dissertation was completed: 1993

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, laboratories in education, technology evaluation

Year dissertation was completed: 1993