Needs and Challenges with respect to Establishing a Collaboratory within Library and Information Science: Practitioners' Perspectives

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Abstract

This paper reports on a study that explored the needs and challenges with respect to the creation of a collaboratory for library and information science practitioners. To identify needs and challenges interviews were conducted with practitioners at a variety of institutions. The results suggest that there is a need for a collaboratory to facilitate on-demand, personalized knowledge sharing. The collaboratory should also be well integrated into the everyday practice of library and information science practitioners.

Keywords
Collaboratory, community knowledge environments, collaborative work environments, library and information science, collaboration, e-social science, interviews

1. Introduction
The vision for the next generation of collaboratories, also referred to as community knowledge environments and collaborative work environments, includes students, teachers, researchers and practitioners using advanced, secure multi-media information and communications technology to have effective and reoccurring access to colleagues and other experts, research data, publications, research instruments, services and tools across geographic distances, organizations and time (Atkins, et al, 2003; Berman & Brady, 2005; Hey & Trefethen, 2003). With substantial national and international financial support, to date most collaboratories have focused on supporting natural science and engineering research and education as well as business (Atkins, et al, 2003; Arzberger & Finholt, 2002; Finholt, 2001; EU Commission New Working Environment Unit, 2006.) Yet there is also a need to support the social sciences (Berman & Brady, 2005) and non-profit organizations, including collaboration among practitioners as well as among practitioners and researchers in the social sciences and non-profit organizations.

As a social science discipline and profession, library and information science (LIS) plays a critical role in the discovery of knowledge, education and democracy, cultural heritage and, more recently, economic development. For example, a recent study conducted in Florida (U.S.) shows that public libraries' return on investment 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.)

Library and information science today faces many challenges. It is inherently multi-disciplinary. For example, it includes research and education in a range of specialties such as: 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 public, children and special libraries. There are rapid changes in information and communications technology, government policies and regulations, the publication industry, and patrons' expectations which have a large impact on the discipline. This has lead to an increasing debate and controversy regarding what topics should be taught in LIS university degree programs and professional education. In addition, government research funding agencies in many countries do not support library science research and higher education to the same degree as other fields, and funding for public institutions such as libraries is always threatened during periods of economic recession. In many countries library science departments are small in terms of faculty. For example, the department at the University of Växjö (Sweden) has 1 full-time faculty member. This situation is mirrored in professional practice where many library practitioners are the only library practitioner in their organization and/or geographical area. This, it is a period of increasing complexity with changes imposed by external forces and limited financial resources for LIS.

In an effort to meet these challenges, libraries initiate collaborative projects to share materials (e.g., Atkinson & Kensler, 2004; Rodger, Jörgensen & D'Elia, 2005) and utilize new information and communications technologies (e.g., JCDL, 2006). Could a collaboratory that spans geographic distances and different types and sizes of organizations more broadly benefit LIS, helping practitioners meet challenges facing their institutions? We know of no research that investigates the potential for a collaboratory within LIS. Could a collaboratory help address challenges facing library and information science practitioners and/or support future visions of the profession?

This paper reports on an exploratory study that investigated library and information science practitioners' perspectives on the needs that might be addressed by a collaboratory, as well as norms and practices within their organizations that might facilitate and/or hinder the adoption of a collaboratory. Our goal is to provide insights regarding the potential and limitations for a collaboratory within this unique and important profession. Without such studies, there is a risk that a digital divide may emerge between social science and natural science professions and disciplines, and between for-profit and non-profit organizations.

2. Previous Research
Throughout this paper, collaboration is defined as human behavior among two or more individuals that facilitates the sharing of meaning and completion of tasks with respect to a mutually-shared super ordinate goal. Collaboration always occurs within social contexts that impose constraints and enables possibilities. It may occur within or across organizations, disciplines (or communities), and/or countries.

Synthesizing previous research on scientific collaboration, Sonnenwald (in press) identified five factors that emerged as important for a collaboration to even be considered. These factors are: scientific, political, socio-economic, resource accessibility and social networks and personal factors.

The factors may also apply to other contexts, such as professional work contexts, by interpreting the scientific factor as a professional factor.

Professional (or scientific) factors reported in the literature that influence whether a collaboration may be established include: the need to discover new knowledge and solve complex problems in a timely manner; increasing specialization and the need to utilize different types of knowledge and expertise; opportunity to extend the scope of a project and foster innovation; diffusion of epistemic and ethical responsibility; and impact on individuals' career advancement. For example, Michael and Higgins (2002) discuss how collaboration can help a library become a world-class innovative library but the library must reward employees based on their abilities to "share knowledge, learn and collaborate" (p.175.)

Political factors include: national and international situations and policies such as acts of aggression and national security policies; promotion of political unity within a region; need for world peace; and, healing of post-war wounds. *Socio-economic factors* focus on opportunities to spread financial risks, leverage financial resources, and support economic development.

The factor, *resource accessibility*, refers to opportunities to gain access to scarce resources, such as specialized expertise, equipment, software, materials, etc., that a collaboration may enable. Collaborations are typically more successful when each partner provides and receives resources. Collaborations typically emerge from *social networks*, or previous connections and inter-connections among individuals. Personal compatibility, compatible work styles, mutual respect, trust and the ability to get along and enjoy each other's company are issues individuals often consider when deciding whether to collaborate. These issues may be influenced by specialized languages, cultural heritage and gender.

In addition to these factors, we need to consider factors that impact technology adoption and use because information and communications technology is an important component of a collaboratory. For examples, collaboratories have been referred to as socio-technical interaction networks (Kling, McKim & King, 2003.) The design and adoption of technology in general is to a large extent about meeting needs, or challenges, within particular contexts. Needs may be based on perceived breakdowns or limitations with current, existing practices (Winograd & Flores, 1986), and advantages over current practices (Grudin, 1994; Rogers, 1995; Wierba, Finholt & Steves, 2002.) Compatibility with current practices and norms is also critical (Rogers, 1995.)

In this exploratory study we consider whether these types of collaboration and technology related factors might enable or constrain the creation of a collaboratory among LIS practitioners.

3. Research Methods
3.1 Data Collection
Interviews were conducted with ten library and information science practitioners working in a variety of settings, including a research university library, regional college library, large city public library, small town public library, government research agency, international corporation, small business, and non-government organization. All participants were managers responsible for library or information services in their organization. All participants, except one, live and work in Sweden, however, the practitioners at the non-government and international organizations have professional responsibilities

worldwide. The interviews were one to three hours in length, with an average length of one hour, 45 minutes.

The participants were introduced to the concept of a collaboratory both in our initial request to participate in an interview and at the beginning of their interview. A collaboratory was defined broadly as a social and technical forum in which information and other resources could be shared among practitioners, students, teachers and researchers to provide the means to enable new types of collaboration, learning and sharing. This definition is based on Atkins, et al (2003) and the Science of Collaboratories report (2003). The interview questions were designed to elicit participants' perspectives on motivations for a collaboratory and socio-technical constraints that may impact its success. All interview questions were open-ended, and follow-up questions were asked to help ensure we captured the participants' meaning. The interviewers were not members of the Swedish library and information science community and thus participants could freely discuss any aspect of the library science community and work without fear of insulting a colleague.

3.2 Data Analysis

The interviews were analyzed using both open coding and axial coding (Robson, 2002.) During open coding a subset of the interviews were read thoroughly and carefully by a researcher who identified coding categories, or coding frames. This initial set of categories and data was discussed among the research team, and similarities with the five factors discussed in the scientific collaboration literature that provide a foundation for scientific collaboration and/or which can prohibit a collaboration from being considered (Sonnenwald, in press) were observed. The remaining interviews were read and analyzed using these coding categories and also looking for any new emergent categories. No new categories emerged, although no data regarding one category, political factors, emerged. In the final step, i.e., during axial coding, all interviews were re-read and analyzed using the coding categories.

Because most of the interviews were conducted in Swedish, many quotes from study participants in the sections below have been translated from Swedish. Every effort was taken to ensure the voice of the participant still was present in the translation.

4. Results

The data analysis shows that the practitioners' reasons for wanting to collaborate and share resources with other LIS practitioners, and obstacles that could prohibit collaboration can be categorized as: professional factors; socio-economic factors; resource accessibility factors; and, social networks and personal factors.

4.1 Professional factors

Many participants reported that they would like a collaboratory to facilitate their individual and their organization's professional development and problem-solving. This was mentioned by all study participants, but most frequently by managers in large organizations, and mirrors the findings by Michael and Higgins (2002.)

Participants reported that they want new, innovative ideas from the wider library community coming into their organization. One manager explained that a collaboratory should ideally put her into contact with a range of community members to introduce new ideas:

> *I would like to have [people]…from different industries, and researchers [in the collaboratory]…You are curious to see new things. You may have completely different ideas than I have, which I can learn, which can trigger me. I would like to have different age groups; young people do not think like old people.*

Four participants also mentioned that they want more specific expert advice in relation to problems that emerge in their daily work – problems that can not easily be solved with the knowledge and resources at hand in their own organization. Several stressed that they want access to, via a collaboratory, experts in different library related topics who can deliver fast and precise answers to specific questions. One manager of a large public library spoke about his need for expert advice in a rapidly changing world where a manager has difficulties knowing what rules apply in different situations:

> *The experts I talk about, I mean it is in a way difficult… the legislation constantly changes and technology develops and the legislation does not follow the technical development, so there would be a lot of questions concerning this.*

One manager of a large university library explicitly stressed that what she thinks is needed is not impersonal expert advice but access to experienced people who can, on demand, visit libraries in order to inspire the staff or show alternative ways of working. This is similar to the results of an online survey conducted by Brown and Ortega (2005). The survey respondents, 72 physical science librarians, reported their most important source of information is personal communication with colleagues. A study participant explained:

> *So something like a committed, interested, experienced… person …in almost every subject… [Let me] borrow your skilled staff. When my staff think they are stuck in old routines, let [the experienced person] come work [with us] and explain how things work elsewhere… It will also be the case that the people who go out will also get something back, that is always the case.*

The same manager emphasized that an experienced library person would probably be most useful for small libraries that have little or no competence in specialized and peripheral areas (e.g., construction and library architecture) in their ordinary network:

> *Imagine that you are thrown out somewhere in a small place where you are two staff and that…. you can get this renovation task…or you are supposed to modernize the library… just to get started. [You think], 'Oh my God what shall we do?'*

This is an issue not discussed in the scientific collaboration literature, that is, a need for specialized expertise to address one-time issues and not for a collaborative projects

4.2 Socio-economic factors

Collaboration and resource sharing can lead to new, profitable services and products, and extend an organization's limited monetary resources. However, collaboration also incurs costs. An issue is whether the costs associated with a collaboratory are greater than its near- and/or long-term benefits.

In contrast to scientific collaboratories and business collaborations that are perceived as providing economic benefits (e.g., Lambert, 2003; Autio, Hameri & Nordberg, 1996; US Office of Science & Technology Policy, 2000), five out of seven participants did not perceive that a collaboratory would financially benefit their organization. Rather they expressed concern that a collaboratory would introduce additional costs, in particular with respect to time. This is clearly an important issue for the practitioners; fifty percent of the participants mentioned it. One concern focuses on the time required to maintain a well-functioning collaboratory:

> *Quite a time consuming thing in the long run. These common sites services are easy to set up but not so easy to maintain…without funding.*

Another concern is the perception that it may be very time consuming to use a collaboratory, e.g., time consuming to log in, check for news, participate in the exchange of information, etc. One participant, who is very positive towards technology mediated collaboration in general, sees this as a large obstacle:

> *Participant: If one has the time, there are a lot of great and fun things one could use technology for but, I don't know...*
> *Interviewer: Is it too time consuming or too difficult or...*
> *Participant: No, it is never too difficult…no, I don't think so, it is rather the time*

Only two participants felt a collaboratory could provide economic benefits. According to a participant from an NGO, collaboration and funding are tightly coupled in their organization. Both are required to enable their projects. A manager of a large corporate library had a very positive view towards a LIS collaboratory, but with the condition that it would bring value into the organization:

> *The absolutely most important thing is that it brings something back to the company.*

4.3 Resource accessibility factors

Establishing a collaboratory is often motivated by the need to gain access to expensive equipment, specialized expertise, software, unique materials, etc. All study participants mentioned one or more resources that they would like to gain access to, and believe a collaboratory could provide. Not surprisingly, most participants stated that it would be good to have access to tools and documents online. However, many participants explicitly said there are already too many online resources that offer tools and documents. What they would prefer is personal contact with people knowledgeable in library and information science. As one manager of a large university library explained:

I think that [having access to people knowledgeable in library science] is the most important thing because you can always read. There is plenty around to read. You can access websites... there are lots. And you can feel that it is interesting but you don't get this extra... No, it must be a human!

Even within our small sample of practitioners, we found matches between needs for knowledge and willingness to share knowledge. For example, one manager of a regional college library explained his needs focus on copyright:

One recurrent question is copyright law. The legal aspects of library management are very complicated questions.

Whereas, a manager of a large corporate library reported:

There are a lot of questions about copyright because companies will get into trouble unless they have sorted out the copy-clearing, and this is an area where I have been involved a lot…So I think I could contribute quite a lot to a network.

Encouragingly, fifty percent of the participants explicitly stated that they have resources that could be shared with other LIS practitioners. Resources mentioned included: individuals with experienced-based expertise; organizational best practices; and tools and content (e.g., databases and training materials). However, the resources mentioned most often focused on people and their knowledge. Tools and materials were mentioned least.

An issue with respect to resource accessibility raised by the NGO participants is unequal access to technology. As reported by our participants and elsewhere (e.g., Olson, Teasley, Bietz & Cogburn, 2002) access to the Internet is not always available or may only be available in a limited way in developing countries:

In Africa, you know not everybody has a computer on their desk and that means getting to a computer and then… getting access…is not quite as easy as when everybody has a computer on their desk which is connected [to a high speed network] all the time…Access is not what's easy.

One of the key ideas of a collaboratory is that members should be able to exchange resources with each other on a reciprocal basis. However, managers in small LIS institutions expressed the belief that they have nothing to offer larger, and wealthier, LIS institutions. As one participant, the manager of a small town public library, said:

Well, we have nothing to offer, I think. At least we have never gotten any inquiries...

This is an issue that is not discussed in collaboration literature, and yet is important. When individuals believe they have nothing to offer they may proactively exclude themselves from many interactions without realizing they may actually be withholding valuable information from others.

4.4 Social networks and personal factors

Collaboration emerges from and also builds social networks. Analysis of the interview data shows that social networks and personal factors prove to be important for many library practitioners irrespective of where they work today. One participant, the manager of a large corporation library, described her vision for a LIS collaboratory:

> *I will get a super network with branches into all kinds of workplaces and activities and the company is very positive towards external networks.*

However, a majority of the participants expressed personal doubts rather than enthusiasm when envisioning a collaboratory. Several participants mentioned that it seems to be difficult to find the right balance between width and scope within a network. A network needs to be wide in order to cover various interests, but not too wide so that is looses focus and becomes uninteresting to everyone. One participant explained:

> *I think [the collaboratory] needs to be focused and it's quite important that the scope is wide enough to be able to make people contribute, but focused enough to be narrow, so one knows it's of interest.*

Another participant speaks about the same issue from his own experience from a national LIS listserv:

> *It's a simple mailing list but it has all gone awry. Too many are on the list. There are too many odd people on the list that post stuff that is of no interest to other people.*

This is in contrast to previous research reports that LIS listservs are valued by LIS practitioners (Brown & Ortega, 1995; Xu, 1998, Kovacs, Robinson & Dixon, 1995), and research on communities of practice in general. This finding raises questions regarding limitations of listservs, communities of practice and large collaboratories.

Other participants questioned whether the collaboratory would be something in addition to their current work activities, require changes to their work styles, or be appreciated by their organization. As two participants commented:

> *It is also a matter…of how you connect back to [the collaboratory] in daily discussions and meetings. You need to somehow build it into the system, into the organization.*

> *I would be less inclined to contribute if I had to do anything different then I was doing already.*

5. Discussion

The results of the analysis indicate that the library and information science practitioners is that a collaboratory is, to most participants, a viable way of connecting to and exchanging resources with other practitioners. Nevertheless, there are many challenges that must be addressed to help ensure

success. Some of the challenges have been identified previously in the literature, and others identify new issues.

The majority of the study participants envisioned that a collaboratory could provide resources to facilitate their individual and their organization's professional development and problem-solving. Some participants talked about this in terms of a need for expert advice while others talked about it as a need for new and innovative ideas or practices to be brought into their organization. It appears that participants find that their own institution occasionally lacks critical professional competences, which may very well also be the case since the demands on LIS practitioners have increased in recent years, at the same time as resources have often decreased. One way of addressing this increased demand without increasing costs could be to increase the knowledge-base among LIS practitioners by connecting them in a collaboratory, a socio-technical interaction network. This is particularly important to small and resource-scarce library organizations. Perhaps the most difficult challenge in this will be to bring about exchange of ideas between organizations and individuals with very different core activities, organizational size, experiences and knowledge, such as small town public libraries and large academic libraries.

As mentioned earlier, collaboration has been shown to provide economic benefits. However, all but two study participants did not believe that a collaboratory would provide economic benefits. Rather it may impose a high cost in terms of time; time needed to maintain a well-functioning collaboratory and time needed to participate in a collaboratory.

In most knowledge organizations people's work is fragmented (Mark, Gonzalez & Harris, 2005), and this increases as the number of electronic systems, emails, etc. increases. Hence, participants' reluctant attitude towards the idea of using a collaboratory is fully understandable. Is it possible to design a collaboratory which will not be a burden to its users, especially when most potential users seem to be overloaded with information already? This has been discussed elsewhere in relation to the design of groupware (Grudin, 1994), and needs to be further considered in relation to a LIS collaboratory.

Access to data is a current focus of most scientific collaboratory efforts (Arzberger & Finholt, 2002.) However, study participants expressed needs primarily for resources of a different kind, namely for intangible resources such as people's knowledge and experience in different areas. Although some of the participants also expressed a wish for things such as tools, legal documents, and useful link collections, several participants explicitly expressed that they have more than enough resources of that kind already available. The majority of participants took the same perspective when they talked about sharing their own resources. Although a few mentioned concrete things, e.g., teaching materials, they would like to share, the majority were more enthusiastic about the idea of sharing their experiences, perspectives and tacit knowledge. A challenge is how to make such intangible resources visible and possible to share in a collaboratory, especially since failures of early collaboratories that attempted to support tacit knowledge sharing have been reported (e.g., Orlikowski, 1993.)

This last point relates clearly to what the participants expressed as the most attractive about the idea of a collaboratory, which was, undoubtedly, the idea of having access to a network of people from a wide range of LIS related organizations. However, here lies also the largest challenge with a LIS

collaboratory: to be able to make the collaboratory focused enough to be interesting to participate in, but still wide enough to be able to promote new collaborations across organizational and disciplinary borders. This is especially challenging because LIS is a multi-disciplinary profession that does not have a recognized unifying core activity or grand challenge. The challenges to meet on a personal level lie in introducing the collaboratory into organizations in a way that complements but does not compete with existing routines and practices, and will be rewarded.

These results suggest that a collaboratory to support LIS practitioners should include an "expert on demand" service. Each organization participating in this service would identify their areas of expertise and commit to allowing their experts to consult a specific number of days per year. These organizations would then be entitled to request expert help from other participating organizations up to and including the same number of days per year. Each requesting organization could be responsible for any travel and living expenses to support a face-to-face meeting. For example, Library A might request a two-day consultation from an expert in Organization B and pay for that expert to come to their library. In turn, organization B might request a one-day consult from Library C. The collaboratory would keep track of expertise and days offered as well as requests for expertise and consulting time provided. Over a three-year period, the numbers of offers and requests per organization could very well be equal.

To explore this idea further research is needed. Examples of issues to be investigated include: representation of expertise for non-experts; design of the management structure and practices within the collaboratory; mechanisms regarding consultation feedback; and, implementation of organizational practices to recognize and reward consulting experts. We look forward to investigating such issues.

6. Acknowledgments

7. References

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