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Understanding eScience: Reflections on a Houston Symposium

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Abstract

EScience is a research methodology combining data collection, storage, and networking on a massive scale. By its very nature, eScience presents new and diverse opportunities in librarianship. While various academic institutions such as Cornell, Georgia Tech, and the University of Massachusetts are already engaged in well-established projects at their libraries, eScience is still relatively new to many others. To explain eScience and its implications for medical librarians within the Texas Medical Center, the Texas Medical Center (TMC) Library hosted an event on February 13, 2012, called *Understanding eScience: A Symposium for Medical Librarians*.

Funded in part by the National Network of Libraries of Medicine--South Central Region (NN/LM-SCR), this symposium's core was a panel of scientists and librarians serving various roles in eScience research. These experts described their work to identify concrete opportunities and challenges for libraries hoping to take on similar roles. Designed with an emphasis on medical librarians, the symposium provided an educational and collaborative opportunity for librarians of all specialties.

Within this article, the authors share their experiences in planning and hosting an eScience event and the catalyst it provided for The TMC Library's on-going involvement in eScience research and collaborations.

History

In recent years, there has been much discussion about eScience and its implications for the library community. EScience has been defined as "a research methodology that is networked and data-driven. It describes the collaboration among computationally intensive science disciplines that create immense data sets that are captured, transported, stored, organized, accessed, mined, visualized, and interpreted in order to extract knowledge" (SoutteReview, 2010).

A number of professional organizations, including the American Library Association (ALA), the Association of Research Libraries (ARL), and the American Society for Information Science & Technology (ASIS&T), are exploring the potential roles of libraries and librarians in eScience (Gold, 2007).

EScience library pioneers include Cornell, Purdue, the University of Oregon, and the University of Houston, all of whom created websites to provide data management services to researchers and faculty. Other li-

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libraries followed with training and information portals, such as the e-Science Portal for New England Librarians, created by the University of Massachusetts.

Participation in eScience is especially important to the TMC Library. As the Regional Medical Library of the NN/LM-SCR, the TMC Library is a leading partner in the development and delivery of biomedical information to the TMC in Houston, as well as to the nation. In addition to making biomedical research available 24/7 to area healthcare professionals and consumers, the TMC Library serves the students, faculty, researchers, and staff of Baylor College of Medicine, University of Texas Health Science Center at Houston, and 47 other institutions in the Texas Medical Center (TMC, 2012).

Purpose

The NN/LM-SCR assists in heightening the Library's community presence and advances our discipline. One of the purposes for *Understanding eScience: A Symposium for Medical Librarians* was to help the NN/LM-SCR meet a specific goal to partially fund an eScience event in Year One of its five-year contract (NN/LM-SCR, 2011). Contract goals must also meet the strategic goals of the TMC Library, and the core activities of eScience were congruous with facets of the TMC Library's mission statement:

- Collect, provide and conserve biomedical information
- Teach strategies and develop techniques for knowledge management
- Provide a center for study, research and Collaboration
- Implement public relations and marketing strategies (2010)

Because the core elements of eScience -- research collaboration, the collection and preservation of data, and the management of that data -- are part of the Library's mission, a presentation on the potential roles for medical librarians in eScience correlates

with what the Library wants to achieve in serving the largest medical center in the world.

Librarianship is deeply enmeshed in the discovery, collection, and storage of information. Training in online search strategies, cataloging of bibliographic records, preserving data sets, and other information management tasks are useful skills for data curation and management.

Such librarian expertise could benefit researchers, particularly those funded by the National Science Foundation (NSF), which now requires that investigators share NSF-funded data and submit a data management plan to describe how they will disseminate and share research results (NSF, 2012). In collaboration with researchers, librarians could engage in eScience as organizers and keepers of the vast data sets added to the research universe every day.

The purpose of this symposium was to educate medical librarians about eScience concepts and to prepare them to become innovators in the field. With goals clearly defined and monetary support from the NN/LM-SCR, we decided to produce a one-day eScience symposium within the Texas Medical Center.

Content Choices

Content for this first-time symposium focused on providing introductory knowledge about the foundations of eScience and potential roles for medical librarians. The target audience was medical librarians within the NN/LM-SCR's five-state region, but librarians from all backgrounds and regions were welcome. Accordingly, the academic backgrounds of our four speakers and their experience with eScience projects were key in deciding the scope and sequence of the event.

We asked that they share specific details about their work in eScience, while providing examples of how librarians could realistically

participate in eScience related activities.

Speaker Choices

The eScience Committee garnered speakers with diverse backgrounds in both the biological and library sciences. This gave our speakers a compelling edge in explaining eScience to the audience, since it enabled them to explain its importance from both the scientist and the librarian point of view.

Neil Rambo, MLIS, Director of the New York University (NYU) Health Sciences Libraries, was the keynote speaker. With degrees in cell and molecular biology and library and information science, Rambo did extensive work to reveal the foundations of eScience within the library environment. His foray into eScience initiatives began during his tenure as a program officer for the ARL, “investigating emerging roles for libraries and librarians in support of computationally- and data-intensive, networked science” (Rambo, 2009). He pointed to the existing infrastructure within research libraries, especially biomedical libraries, which already support the data management tasks required inherent in eScience projects. Their extensive use of the research tools developed by the National Library of Medicine (NLM) make NYU a key player in eScience research programs initiated at the National Institutes of Health (NIH) (Rambo, 2009).

Layne Johnson, MS, PhD, is a Translational Science Information Specialist at the University of Minnesota (UM). With degrees in biology, bacteriology, and microbiology, Johnson’s work in the biotechnology and pharmaceutical industries brought an incredibly rich level of experience and insight. To assist their researchers with NSF-mandated data management plans, UM created an online data management toolbox. Johnson used this example to identify one of the many ways libraries can participate in research collaborations on a broad scale. Librarians are well-positioned to work with scientists as expert searchers, metadata managers, and

institutional liaisons. They might be the fillers for important gaps in the connective tissue of eScience, discovering methods to handle data privacy and security issues and understanding and supporting the data needs of the bench scientist (Johnson, 2012).

Jen Ferguson, MS, MLIS, Data Services Librarian at Northeastern University (NEU), and Neville Prendergast, BGSc, DipEd MLS, Director of the Rudolph Matas Medical Library at Tulane University, both worked as biological researchers before entering librarianship. Ferguson and her team created a digital repository at NEU vigorous enough to provide a full range of data curation services. By comparing NEU’s approach to data sharing and storage with a very different approach taken at Harvard, Ferguson showed how a librarian-driven data curation tool could be highly successful at supporting eScience activities.

Neville Prendergast defined eScience and eResearch and illustrated how those two methodologies mesh to drive the Research Life Cycle. He identified the challenges Tulane faced in building a task force and developing policies to support the institution’s researchers in fulfilling NSF mandates for a data management plan.

Outcomes

The results of the symposium were measured by direct audience response and the subsequent workflows in eScience projects created by TMC Library staff. Attendees were given event packets that asked for rankings on aspects of the speakers, the venue, and the experience as a whole. Audience feedback from paper evaluations showed an overwhelmingly positive response to the event.

We used Survey Monkey to input and analyze data received from 40 out of the 53 attendees. Among six categories provided for assessing the Major Strengths of this ses-

sion: The Instructors and the Information Gained ranked highest, followed by Networking, Creative Ideas, Support Materials, and hands-on Demonstration.

Results showed that 79% of respondents gave the symposium an "A" for overall effectiveness and 75% said it met their expectations. Overall, 92% agreed the symposium was well-organized and 69.2% said they acquired knowledge and skills they can use. Three of the 40 respondents requested additional sessions on eScience, plus training that would better prepare librarians for collaboration with researchers (e.g., web-building, interface design, etc.). A follow-up survey was sent 90 days later, and of the 29 respondents, 62.5% said they had visited our eScience website for information and 58.5% said they were planning eScience events of their own (NN/LM-SCR, 2012). Based on this response, we transformed our registration site into an eScience information portal, which eventually became the TMC Library's first eScience website.

Challenges/Successes

Our greatest challenge was coordinating the speakers' presentation content so it was not overly redundant. Communication via email made it difficult to gel the thoughts and focus of the speakers into one cohesive package. Therefore, we arranged a phone conference between the speakers and members of the eScience Committee to review Power Points and compare notes. This sharing of ideas and images provided an opportunity to preview the content of the symposium, and demonstrated how well the presentations dovetailed to provide a basic understanding of the eScience concept. The speakers agreed it helped them to narrow the scope of their presentations to communicate more effectively with the audience.

Another challenge is that, without additional staff, collaboration with researchers in eScience projects will be limited and the TMC Library will have to remain content with a

liaison role for now. However, we succeeded in fulfilling that role immediately following the event when librarians at Oklahoma State University (OSU), Oklahoma City, and Oklahoma State University, Tulsa, requested our guidance in hosting an eScience event of their own. We hope that our Houston symposium continues to serve as the catalyst for other libraries in the NN/LM-SCR region to participate in eScience initiatives.

Future Goals

After publicizing our symposium experience in the *Journal of eScience Librarianship*, another goal is to share what we have learned at various librarian conferences. We will soon achieve this 2nd goal by presenting our paper at the 2012 Charleston Conference in Charleston, South Carolina, this November. A third goal is to promote eScience initiatives to medical librarians on a local, regional, and national level, as well as to provide resources for data management to our local TMC researchers. To meet these commitments, the authors formed The TMC Library eScience Task Force. The goals of this task force are to:

- Provide a venue for the TMC Library to promote eScience projects relevant to medical librarians.
- Explore and identify future opportunities for the TMC Library to be involved in eScience activities.
- Identify possible collaborative opportunities with TMC researchers.

Recommendations

Plan in advance for how and when key information will be provided to audience members immediately following the event. Our information portal was not ready for access until after our attendees began requesting further information on eScience resources, and it was apparent the Committee should have addressed this need during pre-event

planning. In response, we summarized the eScience work and expertise of our speakers into a list of Take-Home points which were eventually published on our symposium registration pages, along with links to the speakers' presentations (Romano, 2012).

Conclusion

EScience is a data-driven research concept that encompasses the creation of vast data sets on a broad interdisciplinary scale. It is gaining momentum as a venue for librarians to collaborate with researchers and scientists like never before. The data curation necessary for eScience activities will provide librarians a new platform for demonstrating their expertise in data retrieval, collection, and storage. Events like the Houston eScience symposium sponsored by NN/LM-SCR and the TMC Library will proliferate.

This symposium culminated in the creation of the Library's first eScience Task Force, and the Library's eScience Portal, "Understanding e-Science." This portal benefits TMC researchers and librarians with current information on local and national eScience news, education and events, as well as resource links for creating data management plans mandated by federal research-funding agencies.

The TMC Library eScience Task Force shares these experiences in the *Journal of eScience Librarianship* to further encourage other libraries to immerse themselves in eScience projects wherever possible.

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