

TECHNOLOGY PLANNING AND ADMINISTRATION

2005 saw the continued rise of the MIT Libraries as a leader among research libraries in the innovative use of technology and in digital library research, but many challenges confront us in maintaining high quality technology-based services, and in moving our most successful research projects into full-scale production operations. We are addressing these challenges on a number of fronts and defining approaches to solving these problems in foundational ways. MIT is now not only a world leader in Digital Library research, but through innovative faculty/library collaboration we are defining new paradigms for moving faculty-based research into operations that benefit the entire institution.

As an effect of this increased growth, this year we brought together a widely distributed group of staff who work on technology into new quarters in building E25: MIT Libraries' Technology Services and Digital Library Research. All the staff of the Systems and Technology Services (STS) department are now physically co-located with the sponsored research staff of the Digital Library Research Group (SLRG) in order to better leverage the different areas of expertise represented in these groups and work more efficiently to help the MIT Libraries with technology-related projects, systems, and services. At the same time, the different units of the MIT Libraries have been increasing their allocation of staff to work on local technology needs, primarily desktop computer support, so that now there are full-time staff in almost all parts of the library system to manage that work, which has allowed the central technology staff to focus their efforts on more specialized technology and on library-enterprise systems such as our online integrated library system (Barton) and our digital archive system (DSpace).

The MIT Libraries continue to innovate with technology not only at MIT, but in the larger world-wide context. DSpace continues to play a major role in the transition of libraries and archives towards professional stewardship of digital research and teaching materials, and as a platform for exploring such critical issues as public access to scholarship, the role of intellectual property and copyright for digital scholarship, how to begin to address the new demands of preserving digital content for archival time frames, and how to make the expanding universe of digital data interoperable with other emerging technologies and work practices such as MIT's OpenCourseWare and the new course management system Sakai. MIT Libraries' technology staff worked with Google this year to help define the Google Scholar search engine, and to ensure that it would allow MIT-affiliated students and researchers to use the Libraries' licensed electronic journals and databases no matter where they are or how they find them. We continue to work closely with the library software vendor community, particularly the Ex Libris company, by co-developing products with them such as the Verde Electronic Resource Management system and by advising them on strategic planning for the future.

SYSTEMS AND TECHNOLOGY SERVICES

Goals and Priorities

Technology operations are a high priority for the MIT Libraries, and the Systems and Technology Services department provides support for the technology operations as well as leadership in envisioning creative uses of current computer systems and suggestions for technology-based solutions to problems. The department is working hard to maintain the stability and reliability of the Libraries' hardware and software, and to provide or coordinate continuing education and training for Libraries' staff in a range of technology tools and topics. Perhaps the greatest ongoing challenge is finding the balance between supporting local initiatives and the larger centralized projects, encouraging creativity throughout our system without compromising support to the many existing services.

Accomplishments

Production Operations

- DSpace: The STS department assumed responsibility this year for supporting MIT's DSpace digital repository system. This was an important milestone for the Libraries. DSpace is an increasingly important part of our information environment and moving its support out of the digital library research group and into the production operations group demonstrates the Libraries' commitment to the DSpace service. But DSpace is a new and rapidly evolving system, so it is complex and time-consuming to maintain, and requires effort from many people to support its different aspects. The challenge of providing operational support for DSpace without new resources was considerable.
- Barton: STS this year managed a major project to plan, coordinate, and implement an upgrade of the Libraries' integrated library system: Barton. This is the first major upgrade done since the ALEPH 500 system was first implemented four years ago. Barton is the main business system of the Libraries so almost every staff member depends on it to perform their job, and the entire MIT community depends on it to use the Libraries' collections. An upgrade of this magnitude represents significant risk of disruption to the work of many people, and the process went extremely well.
- MIT Libraries' public website: Usage of the Libraries' public website continues to increase dramatically. The usage statistics for the website show more than a five-fold increase since its roll out in 2001, and a doubling since last year.
- SFX: The Libraries' web link resolver is an important part of the infrastructure that supports access by MIT students, faculty and researchers to the remotely held, licensed electronic resources that are the most heavily used part of our collections. This year SFX was upgraded to a new version (v 3.0) which supports new features and integration with other Ex Libris products in the future. We continually evaluate SFX to find ways to improve its use and usability by the MIT public.

Support for New Initiatives

- Verde: A new SFX-Verde Group was convened to do extensive analysis leading to a recommendation about whether and how to implement the new Electronic Resource Management system from Ex Libris, and how to provide a public interface to it. STS staff are managing that group and providing significant input to its analysis.
- Management system for digitized images from the Rotch Library's Visual Collections (RVC): STS staff worked extensively on an analysis of the requirements and possible solutions for digital image management in the MIT Libraries, and is developing recommendations for infrastructure to support digitizing the RVC slide library collection.
- Interlibrary Loan: STS assisted the Document Services and Access Services departments to investigate and analyze the ILLiad software for its potential use at MIT for interlibrary borrowing (i.e. borrowing from other libraries).
- Virtual Reference Services: STS helped evaluate and implement Request Tracker, a software system to support the Libraries' Ask Us! online reference service. The support requirements were defined to move the Ask Us! service beyond the prototype phase and into a true production service.
- Web access to the digital image catalog: Functional requirements and preliminary testing were completed for a simple web interface to the IRIS (digital image metadata) catalog in Rotch Library.

DIGITAL LIBRARY RESEARCH GROUP

DSpace

While the DSpace@MIT production service has migrated from the research realm into full support by the STS department, the DSpace open source software and the DSpace Federation remain in the realm of the Digital Library Research Group. The DSpace open source software project (<http://dspace.org/>) continues to be one of the definitive projects in the international digital library arena, as well as the digital media lifecycle management domain in general. The MIT Libraries continue to collaborate with Hewlett Packard on the DSpace project, as well as a growing number of other research institutions and organizations worldwide. Serious adoption of the DSpace platform stands at more than one hundred organizations world wide, and DSpace has become an exemplar open source software project in the higher education and cultural heritage domains, with potential for adoption well beyond that. Among many other accomplishments, this year MIT helped to organize the second annual DSpace user group meeting held in Cambridge, England, which was attended by more than 140 individuals from 22 countries. During the past year MIT contributed significant new features and functions to the system and honed the definition of services built on the platform. MIT is working with the international community on the important related intellectual property and social issues that DSpace helps to bring into focus such as providing Open Access to research and teaching material produced by faculty at research organizations like MIT.

Research projects

The Digital Libraries Research Group continues to develop and execute a range of projects in the digital library research domain, and to perform extensive outreach for the projects in the library and archives community, among others. In 2004-05 the DLRG worked on five grant-funded research projects, ranging from pure research to advanced development, and from the highly technical to the purely sociological. Current projects include:

- DSpace@Cambridge, a collaboration with the Cambridge University Library in the UK with funding from the Cambridge-MIT Institute (CMI) to deploy DSpace at Cambridge University, promote DSpace in the UK, and develop the system in the areas of digital preservation and support for educational technology. This project has developed significant new functionality in DSpace to support long term preservation of digital content in various technical formats. It is also supporting collaboration with important educational technology initiatives such as Sakai and LRN (in use at the MIT Sloan School). Cambridge is taking on a more visual leadership role in the DSpace community, particularly in the UK and Europe, and the collaboration with MIT provides both institutions with important insights into how the DSpace platform can function in very different environments.
- LEADIRS, a second CMI-funded collaboration with the Cambridge University Library in the UK, developed and ran a successful workshop series on Institutional Repository issues for UK institutions. The series was attended by a sell-out audience of more than 25 institutions, and has had a major impact on understanding and adoption of this technology and the related services in the UK context. Materials from the LEADIRS workshop were published via the DSpace Federation website, and have been turned over to the SPARC Europe organization for continued development of similar workshops in the future.
- SIMILE, an MIT Libraries' collaboration with the MIT CSAIL, the W3C, and HP Labs to bring Semantic Web technology into the real-world domain of library metadata, and to integrate that technology into DSpace. 2005 marked the end of the collaboration with HP, and the definition of a new phase of the project working with the Andrew W. Mellon Foundation. SIMILE had a very successful year, producing several important prototype tools including Longwell (a faceted metadata browser), Piggy Bank (a personal metadata management tool that works with the Firefox web browser), and Welkin (a tool for exploring and analyzing RDF-encoded metadata). The project team has hit its stride, and is now attracting world wide attention for their cutting edge yet practical approach to leveraging this technology. The project's collaboration between research faculty, standards organizations, and the Libraries are providing a new model for how research universities

can leverage their own research for local benefit.

- CWSpace, a Microsoft iCampus-funded project to investigate the standards and protocols necessary to archive educational material produced under the OpenCourseWare initiative into long-term digital repositories like DSpace. This year the project finished the standards specifications and built a prototype system to archive a sample of OCW's courses. The project team has already built a prototype DSpace that interoperates with various campus learning management systems to support reuse of OCW's course websites and teaching materials, and is making significant improvements to DSpace's support for interoperability in general.
- DSRB, a project funded by the US National Archives and Records Administration through the NSF's National Program for Advanced Computing Initiatives, collaborating with the University of California, San Diego Libraries and the San Diego Supercomputer Center on integration of new data grid technology for content storage with digital library and archive technologies like DSpace. The project concluded its first year of work with the successful integration of DSpace and the SRB software from the Supercomputer Center, and demonstrations of archived digital collections in the integrated system. The project was recently reviewed in a feature article in MIT's Technology Review magazine.

OTHER ISSUES AND INITIATIVES

Computing Infrastructure

The MIT Libraries have this year acquired new DSpace hardware from HP, including more than 10Tb of storage capacity and two new servers. We continue to invest in new hardware for production systems, and are working with the IS&T organization on how to scale up our production operations in the future without replicating IS&T's infrastructure in the library. As a visible part of MIT, the Libraries' computer systems are always under threat from network intruders, and we must also uphold increasingly complex rules about access control and security for the networked digital material we license for MIT or provide directly through systems like DSpace. The tension between good network security and user convenience continues to be a challenge, and MIT is beginning to think about new approaches to online security (e.g. Shibboleth) as these threats and challenges become ever more time-consuming.

Libraries and Educational Technology

The Libraries continue to play an important role in educational technology development both at MIT and beyond. This year the MIT Libraries were involved in initiatives to develop closer integration of legacy library technology (e.g. the integrated library system, e-reserves systems, e-resource provision systems, etc.) with emerging open source educational technology platforms like Sakai and the LRN system in use at the MIT Sloan School among other institutions. The MIT Libraries are committed to insuring that library resources, including collections and services, remain as central to the teaching mission and as easy to use in the online environment as they always have been in print. MIT Libraries are heavily involved in all educational technology architectural and service planning on campus.

Service Frameworks for Digital Libraries

The MIT Libraries began collaboration in 2005 with a number of other research and library organizations under the aegis of the Digital Library Federation to begin to define a "service framework" for the emerging digital library. This work continues, but already it has proven to be instrumental in building communication channels with other, related communities of practice (e.g. educational technology, publishing, records management, e-science, and so on). The group will create a service framework and a set of core services against which digital libraries will be able to measure themselves and their position in the digital environment. Staff from across the MIT Libraries have been participating actively in this work and are using it to better understand where we ourselves need to go to remain high-quality, relevant, and distinguished in the digital future.

CONCLUSION

2005 has once again been a year of major progress for technology in the MIT Libraries. Production systems continue to improve and become more reliable while we continue to bring new systems online. New technology-based projects and initiatives are being undertaken with increasing ease and success. The MIT Libraries' digital library research program continues to establish itself as one of the premiere such programs in the world, and is attracting an increasing amount of attention and funding. The opportunities to exploit technology and to advance the work of the MIT Libraries and of libraries in general, are becoming more achievable with each year. 2006 will mark the beginning of at least two new research projects, and an increased sophistication in deploying technology to support the library in its ongoing transition to the digital environment.

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