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by Inna Kouper, Katherine Akers and Matthew Lavin
Education, practice and theory. All three of these aspects of information architecture (IA) are covered in our annual IA issue “Information Architects: What We Do and How We Learn.” In our lead article, Robert Glushko presents ideas about organizing as a general, interdisciplinary problem from his recent book *The Discipline of Organization*. He introduces a framework for analyzing organizational problems and systems, touching also on the problems of teaching students from heterogeneous backgrounds in a single course. The challenges of teaching IA, where interdisciplinarity is so pervasive, are also treated by Craig MacDonald and Thom Haller, our associate editor for IA. MacDonald conducted research to determine the sources from which practicing IAs say they learn their craft, while Haller explains the approach he used for 15 years to teach IA. Finally, we cover practice with both John Heffernan and Paula Land giving advice about preparing and executing system migrations.

Interdisciplinarity is also the focus of the RDAP Review, as Inna Kouper, Katherine Akers and Matthew Lavin discuss their highly varied programs and goals as Council on Library and Information Resources (CLIR) data curation postdoctoral fellows. In common with information architecture, RDAP is a diverse activity that attracts and requires input from many different perspectives. ASIS&T itself is the focus of the rest of the issue. In his last column as ASIS&T 2013 president, Andrew Dillon reflects on the Association’s recent accomplishments and the way in which programs must and do carry across multiple years, a process aided by our system of having a president-elect, a president and a past president who are active in the governance of the Association. We also include reports in Inside ASIS&T on programs that the organization has sponsored or co-sponsored: a doctoral forum in July at the conference of the International Society of Scientometrics and Informetrics in Vienna, Austria (Christian Schlögl); ASIS&T’s participation with the AAAS Science and Human Rights Coalition (Toni Carbo); and a panel of ASIS&T Board Members discussing information science research with students at McGill University during the Board’s July retreat in Montreal (Rhiannon Gainor).
As this is my farewell column as president, the tendency to take stock and attempt to tidy up loose ends proves irresistible. The term of the Association’s presidency, however, allows little chance of completing an agenda, no matter what we hope for or promise in our original statements of candidacy. In reality, you take office with some ideas, immediately face pressing existing business from the last term and if you’re lucky, you initiate some of your own projects before handing off to the next incumbent. Since we all know our replacements, there is little time for any one of us to become too comfortable as president.

In a very real way, this weaving together of presidential activities and initiatives across the years is good for the Association. It ensures a slow, hopefully methodical, process of leadership and goal setting. This weaving works particularly well when a group of leaders share similar ideals for the association, as I believe I have been fortunate to experience in both my predecessors and my successors. Few remember our statements when we sought election, but I know from speaking to those who served and will serve as ASIS&T president that we all have similar hopes and plans for our Association.

Primarily, this year will be remembered for the name change overwhelmingly approved by members to reflect our global reach. The explosion of interest in information and its underlying technologies and the impact they have on human activities knows no national boundaries. Why then, many of us asked, did our name not reflect this? But a name change does not happen overnight. The process we followed was the product...
As I sign off, I know we are putting in place processes to position ASIS&T at the forefront of information science discourse.

of several years’ deliberation, and while my statement of intent when running for president included a promise to explore this option seriously, I was actually able to preside over its full implementation thanks to the work of former president Diane Sonnenwald, who laid the groundwork for the ballot. Even then, I would be remiss if I did not acknowledge that it was an issue that was first discussed under the terms of Nick Belkin, Sam Hastings and Trudi Bellardo Hahn. All this reflection to say, serious changes are the result of years of discussion, and many people play a role in shaping the society, though the record might not always reflect it.

A less visible but no doubt likely important set of tasks has been ongoing since the name change. Thanks to our leading international members, we are beginning to target potential new members in other parts of the world by direct outreach. By issuing personal presidential invitations to join and explaining the benefits of membership in the recipients’ native language, we are hoping to increase the number of members from key geographic regions. We are starting with China, but the initiative will spread to other countries. This project will outlive my term as we actively pursue all approaches to growing our membership and positioning ASIS&T as the primary professional association for information science around the world.

No less ambitious but certainly more visible to all is the commitment taken at the summer retreat to hold an ASIS&T Annual Meeting outside of North America in the next few years. Europe is likely the venue and 2016 the probable year, given the contractual commitments already made. We run EuroIA already, but a full Annual Meeting on another continent is important if we are to deliver our promise of being the international society for information professionals.

As I sign off, I know we are putting in place processes to position ASIS&T at the forefront of information science discourse. Our society is also in need of internal reorganization to improve our web presence, and you can expect announcements about the steps we are taking here in due course. We are building new relationships through our partnership with DCMI. We are examining ways to make the connection between student and local chapters more seamless, to make clearer and more obvious the membership transition between student and professional status (did you know we allow reduced membership rates for the three years post-graduation?). And yes, we are rethinking how ASIS&T is organized around committees and task forces as well as how we might broaden our publication coverage through different outlets. You will witness outcomes from our current work and witness further new initiatives under the terms of future presidents. This is as it should be for an ongoing, evolving professional association. But you don’t just have to witness these changes; you can get involved and directly shape them.

When I accepted the presidency, I looked at the list of names of those who had gone before me and wondered how it was that I had come this far. I still wonder. In every life, luck plays a far greater role than the successful will ever admit, but I have no problem acknowledging it. I have been so very fortunate to work with and for this Association, and I will not forget the gift bestowed upon me when I was elected. Thank you for your support, for your commitment to ASIS&T and to the values of our field in shaping a better world.
Last year we celebrated our 75th anniversary at the Annual Meeting in Baltimore. This year, we celebrate our recent name change designed to emphasize our multi-nationalism. And to punctuate the name change, for only the third time in the organization’s history, we’re holding our Annual Meeting outside the United States. Plan now to be a part of the first Annual Meeting under the new and improved moniker, Association for Information Science and Technology, as we gather in Montreal, November 1-5. While we work at redefining our geographic boundaries, both literally – with our venue – and figuratively – with our name change – this year’s theme, Beyond the Cloud: Rethinking Information Boundaries, suggests that information and related notions are also constantly redefined in our ever-changing information world.

Conference chairs France Bouthillier, McGill University, and Boryung Ju, Louisiana State University, have prepared a program rich in content that will draw attendance from scholars and practitioners from information-related fields all over the world. The program focuses on research and technological development on the latest issues affecting information environments, information phenomena and information users. Sessions on a wide range of research topics and related practical issues such as cloud-based metadata, biomedical research, social informatics, collective information seeking, adoption of social media, digital humanities and human information interaction, among others, are included in the program packed with interesting content.

Keynote speaker for the 2013 Annual Meeting is Jorge García, a senior business intelligence and data management analyst for Technical Evaluation Centers in Montreal. His speech is scheduled for 1:00 p.m. Sunday. But before settling in for three full days of technical sessions, why not take advantage of a pre-conference workshop to sharpen your skills or to learn something new? On Friday, November 1, and Saturday, November 2, you can select from among the following topics: PIM 2013: Breaking Out to More Practical Progress in Personal Information Management; Metrics 2013: Workshop on Informetric and Scientometric Research (SIG/MET); 9th Annual Social Informatics Research Symposium (SIG/SI); SIG/CR Workshop: Big Data, Linked Data: Classification Research at the Junction; and 13th Annual SIG/USE Research Symposium: Information Behavior on the Move: Information Needs, Seeking and Use in the Era of Mobile Communications. Full details, including registration information and required fees, on these special seminars are available at http://asis.org/asist2013/seminars_workshops.html.

See you in Montreal!
Newly Elected Members to Join ASIS&T Board of Directors

Each year at the ASIS&T Annual Meeting, a new administrative year begins, and the first order of business is the introduction and seating of newly elected members of the ASIS&T Board of Directors. When the membership gathers in Montreal in early November for the 76th Annual Meeting, the changing of the guard will take place with the inauguration of a new president and the seating of the new president-elect and two directors-at-large.

Positions filled through the summer ballotting process are for three-year terms. Those elected are Sandra Hirsh, president-elect, and Lauren Harrison and June Abbas, directors-at-large. In addition, treasurer Vicki Gregory was re-elected to another term in her position.

When the new members take their seats, Harry Bruce, elected last year as president-elect, will assume the presidency from Andrew Dillon, who continues on the Board for an additional year as past president.

Harry Bruce is professor and dean of the Information School of the University of Washington. Before coming to the University of Washington in 1998, Harry was a faculty member in the department of information studies at the University of Technology in Sydney. Harry is a recipient of the ASIS&T UMI Doctoral Dissertation award; has served as a member of the JASIST editorial board; and is a passionate and effective leader and advocate for the discipline of information science and the information professions. His research and scholarship focus on the study of human information behavior. The purpose of this work is to develop a deeper understanding of how people need, seek and use information in their professional and everyday lives. The new knowledge generated by this research is used to inform the development or enhancement of resources, services and technologies that facilitate information access and use.

Sandra Hirsh is professor and director of the School of Library and Information Science at San Jose State University. Prior to joining SJSU in 2010, Hirsh held a number of corporate jobs, including senior user experience manager at Microsoft and director of the information research program at HP Labs. Before the corporate stints, Hirsh was on the faculty at the University of Arizona. Her research interests focus on information-seeking behavior and understanding the information needs of a broad spectrum of users. Hirsh has served ASIS&T in a number of capacities, including as chair of the current Information Professionals Task Force and on conference organizing and program planning committees. Hirsh was serving as faculty advisor to the SJSU student chapter of ASIS&T when it was named Student Chapter-of-the-Year in 2012.

Lauren Harrison is a senior scientist in pharmaceutical research and development informatics at Hoffmann-La Roche Inc., where she has been employed since 1979. Lauren has served in many global information scientist positions, including manager of library and information science and most recently as part of Hoffmann-La Roche’s newly created Translational Clinical Research Center. Lauren is also passionate about creating a new generation of information scientists so she serves as an adjunct professor at the Palmer School of Library & Information. Lauren has been active in ASIS&T since 1991. On the chapter level, she served as program chair, chapter chair and immediate past chair of the NJ Chapter. She also served as chair of SIG/MED for three terms. On the national level Lauren has served on the Leadership Committee and the ASIS&T Lecture Series Award Jury.

June Abbas is professor in the School of Library and Information Studies (SLIS) at the University of Oklahoma, Norman campus. She taught in the Department of Library and Information Studies at the State University of New...
York in Buffalo before moving to Oklahoma. She also held professional positions in public and special libraries. Her research focuses on the development of user-centered digital libraries, institutional repositories and other knowledge organization structures. She conducts research on youth and their use of technology, and the intersection between information behavior, information retrieval and structures for organizing knowledge. She has also served as project manager on eight digital library projects and on task forces to develop institutional repositories.

**Vicki L. Gregory**, re-elected as ASIS&T treasurer, is a professor at the School of Information, University of South Florida. Since joining ASIS&T in 1984, she has served as president of the Florida Chapter and, on the national level, has been a member of SIG/LAN, which she also chaired, and SIG/DL. She has held the elected positions of both deputy director and director of SIG Cabinet. For the last six years she has been ASIS&T treasurer; previously she was a member of the Budget and Finance Committee, pursuant to which service she developed an understanding of the strengths and weaknesses of the Society’s finances and as well as the ASIS&T budgeting process. During the last several years she has worked with ASIS&T management to develop a prudent investment program for the organization.

In addition to the election of officers, the summer ballot to the membership included a bylaws amendment changing the response window for ballots to be returned from 70 days from issue to 35 days. The amendment passed.

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**ASIS&T History Fund Grants Awards**

The ASIS&T History Fund, established by the Board of Directors to support and encourage research and publication in the history of information science and technology, announces the winners of the Research Award and the Best Paper Award – its two annual awards.

Kalpana Shankar and Kristin Eschenfelder are the recipients of the ASIS&T History Fund Research Award for their research project entitled “Social Science Data Archives: A Historical View of Sustainability, Access and Use.” In the researchers’ words, “This project will focus on the earliest and most long-standing example of scientific data archives: social science data archives (SSDAs). Social science data – drawn from government censuses, marketing surveys, historical documents and academic research studies – predate both computers and the Internet, and provide a unique opportunity to examine what makes an archive sustainable over long periods of time, through the ups and downs of funding cycles, and across massive changes in technical and organizational infrastructure.”

Xiaohua Zhu receives the ASIS&T History Fund Best Paper Award for “Who Had Access to JURIS?: A Failed Case of Open Access.” The abstract of this paper says, “In the early 1990s, public interest groups and small legal publishers pushed for public access to federal court decisions contained in JURIS, a legal information retrieval system used for in-house search by government employees. This early open access effort to free the law not only failed but eventually led to the shutdown of the JURIS system. This paper presents the findings of a historical investigation into this shutdown. It argues that the open access movement involves complicated social negotiations – many factors participated in shaping access rights to primary legal information in digital format. The factors leading to the failure of the open access request included relevant government agencies’ indifference about information dissemination, commercial information providers’ interests and the ambiguity of the copyright ability of case law information. This study contributes to the broader open access and open knowledge (OA/OK) debates by presenting a failed case in the early stage of the open access movement and by summarizing the lessons learned from this failed case.”

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Prospective underwa y for ASIS&T Spring Summits

The program committees are already hard at work planning the activities for the two spring ASIS&T summits that the information world has come to expect. Both the 2014 Research Data Access and Preservation Summit – RDAP14 – and IA Summit 2014 will be held in late March 2014 in San Diego, California.

RDAP 14 will be March 25-27. Program chair Andrew Johnson, University of Colorado Boulder Libraries, says the summit will feature two and half days of programming with an emphasis on practical approaches to research data management, access and preservation, including success stories (and lessons learned), innovative research and resources and tools developed by and for the community. The program will include invited panels and presentations, an interactive poster session, lightning talks and a hands-on workshop.

IA Summit 2014, under the theme The Path Ahead, will celebrate its 15th year at its meeting March 25-30. Program planners say that this year’s meeting will reflect on current challenges and opportunities as well as on the rich history of the annual gathering and the conversations it has begun.

Mark your calendars and keep watching for updated information on the two ASIS&T spring summits. ■

New Editor Takes on ASIS&T Monograph Series

G erald Benoît, associate professor at Simmons College, Graduate School of Library and Information Science, is the new editor of the ASIS&T Monograph series. In this role, Gerry will acquire and develop print and digital monographs covering a range of practical and theoretical topics in information science and technology and allied disciplines.

The appointment was made by ASIS&T in cooperation with Information Today, Inc., publisher of ASIS&T monographs. In announcing the appointment, ASIS&T president Andrew Dillon said, “We are pleased to have someone with a strong international orientation accept this position. With his language skills and broad teaching experience across the technical and cultural aspects of the field, as well as his business experience as a consultant on information systems, Gerry is well-positioned to advance the monograph series.”

In addition to his PhD from UCLA, Gerry holds degrees in French and Russian from the University of California, and he completed studies in mathematics and graphic design. Before beginning his teaching/academic career, he worked as a programmer/analyst at UCLA’s Davis School of Medicine and as art director and partner at Imada Wong Park + Benoît.

Thomas H. Hogan, Sr., president and CEO of Information Today and a past president of ASIS&T, said, “We are very pleased to have found in Gerald Benoît an editor with the skills and vision needed to bring this small but highly regarded series to the next level. As the information age accelerates, we look forward to working with Gerry and ASIS&T to provide authoritative, in-depth coverage of topics that matter to readers in the field.”

Planning Underway for ASIS&T Spring Summits

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News about ASIS&T Members

Rutgers University distinguished professor Nicholas Belkin and Chirag Shah, assistant professor, have been awarded a $53,000 Google Research Award for a study entitled, “Automatic Identification of Information Searcher Intentions During an Information Seeking Session.” The study will examine how to automatically determine what a person engaging in information seeking on the web intends to accomplish at any one time during an information-seeking episode based on his or her behavior.

News from ASIS&T Chapters

The Potomac Valley Chapter of ASIS&T will jump into the increasingly important world of cybersecurity with its mid-October meeting entitled Shattered Boundaries: Whither the Cyber Future. The speaker for this discussion of the vulnerabilities of cyberspace and the challenges of addressing them is Harvey Rishikof, Drexel University, who specializes in matters related to national security law, terrorism, civil liberties, the U.S. Constitution and such. He currently
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News from ASIS&T SIGs

SIG/III Names Winners of 2013 International Paper Contest

For the 13th consecutive year, ASIS&T SIG/International Information Issues (SIG/III) has announced winners for its annual International Paper Contest. The winners are

- 2nd Place: Maryam Mousavizadeh, et al, Iran, *Visualizing the Structure of Subject Trends in Persian Articles Published During 2008-2012 in Information Organization Domain*

The principal author of each paper receives a two-year individual membership in ASIS&T. In addition, the first place winner is awarded a minimum of $1000 to attend the ASIS&T Annual Meeting in Montreal.

 Winners of the $1000 Best Social Informatics Paper are Monica Garfield, Bentley University, and Alan Dennis, Indiana University, for their paper “Toward an Integrated Model of Group Development: Disruption of Routines by Technology-Induced Change,” published in the *Journal of Management Information Systems*, 29(3), 43-86.


In addition to their cash awards, authors have the opportunity to present their papers at the 9th SIG/SI Research Symposium at the Annual Meeting in Montreal.

In Memoriam

F. W. “Wilf” Lancaster, professor emeritus at the Graduate School of Library and Information Science at the University of Illinois, passed away in late August at his home in Urbana, Illinois. He was 79 years old. He is survived by his wife of 52 years, Cesaria; his children Miriam, Owen, Jude, Aaron, Lakshmi and Raji; and 13 grandchildren.

Lancaster began his career in England after graduating as an associate of the British Library Association from the University of Northumbria at Newcastle in 1955. He first immigrated to the United States in 1959 when he accepted a position as senior librarian for science and technology at the Akron Public Library. Over the next few years, he held several positions in the United States and returned to the United Kingdom for a while. But in 1964 he returned to the United States, where he became involved in the design, evaluation and management of MEDLARS, the National Library of Medicine’s computerized bibliographic retrieval system for articles in academic journals in medicine and allied health professions.

In 1970, he became an associate professor in the University of Illinois Graduate School of Library and Information Science. He was promoted to full professor in 1972, a position he held until his retirement in 1992. During his distinguished career, he taught courses in information retrieval, bibliometrics, bibliographic organization, and the evaluation of library and information services. He served as the editor of *Library Trends*, a quarterly journal examining critical trends in professional librarianship, from 1986 to 2006.

Lancaster was recognized throughout the world as a leader in the field of library and information science. Among many honors, he received three Fulbright fellowships for research and teaching abroad and was named a fellow of the Library Association of Great Britain. He was also honored many times by the Association for Information Science and Technology (ASIS&T). He was named Award of Merit winner in 1988; Outstanding Information Science Teacher in 1980; and author of Best Information Science Book four times.
Information Science & Technology and Human Rights: ASIS&T’s Participation in the AAAS Science and Human Rights Coalition*
by Toni Carbo

EDITOR’S SUMMARY
ASIS&T core principles, including intellectual freedom, access to public information and balancing access with privacy, and the author’s membership in the American Association for the Advancement of Science (AAAS) prompted ASIS&T to get involved in the AAAS Science and Human Rights Coalition. The Association joins 51 other science and engineering organizations and 70 individuals promoting human rights issues through the coalition, which was launched in 2009. Among the group’s activities are communications to expand appreciation of the scientific and engineering communities’ role in human rights efforts and developing teaching modules on the interaction of science and engineering with human rights. As ASIS&T representative to the coalition, Carbo invites member involvement and contributions to an updated, annotated bibliography of resources on information science and technology and human rights.

KEYWORDS
human rights
intellectual freedom
information access
privacy
information science
information technology
professional associations

As a member of both ASIS&T and the American Association for the Advancement of Science (AAAS) since the early 1970s, I have become increasingly aware of the overlapping interests and concerns among many ASIS&T and AAAS members, especially as demonstrated in the work of the AAAS Scientific Responsibility, Human Rights and Law Program (http://srhrl.aaas.org) and its Science and Human Rights Coalition. Thus, I approached the ASIS&T Board early in 2013 and asked for approval for ASIS&T to join the coalition, which was granted. I am honored to serve as the ASIS&T representative to the coalition for the near future, and I hope that other members will also be interested in assuming this responsibility.

From its earliest roots as the American Documentation Institute, ASIS&T has been involved in research, education and activities to ensure that individuals around the world can participate in the entire lifecycle of information: from its creation/generation, through its instantiation, organization and management, and preservation, to its dissemination, evaluation and use. Such principles as intellectual freedom, access to public information, protection of privacy of personally identifiable information, balancing access and privacy with security and many others have been addressed at our meetings, in our publications and programs, and through our own actions as

*The views expressed in this article are those of the author and do not necessarily represent those of AAAS or of the coalition.

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The principles are encapsulated in the *ASIS&T Professional Guidelines*, adopted by the Society on May 30, 1992 (www.asis.org/professional_guidelines.html). The Guidelines identify and stress the responsibilities of ASIS&T members (and of all information professionals) to employers/clients/system users, to the profession and to society worldwide. High among these responsibilities are treating all persons fairly, being truthful, “adhering to principles of due process and equality of opportunity” and resisting all forms of censorship. These and other core human rights have continued to be addressed and emphasized throughout ASIS&T’s work over its more than 75 years, including, for example, in the continued increase in international activities, such as those of the Special Interest Group/International Information Issues, which last year celebrated its own 30th anniversary.

Although ASIS&T does not engage in political activities as an association, many of its members have actively participated in societal issues through workshops, programs and other activities to address these principles and concerns around the world. These include, for example, UNESCO Information for All Programs, international conferences, as well as courses and continuing education programs, on information ethics, and international publications. Given our history and principles, it seemed clear that joining the coalition could help promote causes that are important to our Association and its members.

In my new role as ASIS&T representative, I attended the July 11-12, 2013, coalition and council meetings in Washington, D.C., and quickly learned that the coalition is a very distinguished group of representatives from the 36 member organizations, 15 affiliated organizations and of 70 individual, affiliated scientists. The member organizations include a wide range of scientific and engineering groups, such as the American Physical Society, American Society of Civil Engineers, American Statistical Association, Psychologists for Social Responsibility and Sociologists Without Borders, and humanities groups, including the American Historical Association and the American Philosophical Association. Affiliated organizations include the American Academy of Forensic Sciences, the Committee of Concerned Scientists, the Fulbright Academy of Science & Technology and Objectif Sciences International. These are organizations that share many values and interests with ASIS&T and with which, in my opinion, we should be interacting much more actively and frequently. Of course, all of them also rely upon information, related technologies and information professionals to achieve their goals and objectives.

The coalition came about as a result of a series of discussions among individuals from 42 organizations in 2005, which led to other discussions and meetings and resulted in the formal launch of the coalition in January 2009. The coalition describes itself broadly as “a network of scientific and engineering membership organizations that recognize a role for scientists and engineers in human rights” (http://shr.aaas.org/coalition/index.shtml).

Several working groups were created to address key topics of interest: Welfare of Scientists, Ethics & Human Rights, Service to the STEM Community, Service to the Human Rights Community and Education and Information Resources.

Among the many major current activities four are of particular interest to ASIS&T members:

1. A Joint Initiative on Article 15: Right to the benefits of scientific progress and applications of the International Covenant on Economic, Social and Cultural Rights (http://shr.aaas.org/coalition/article15/index.shtml);

2. An outreach and communication committee to expand and grow the coalition’s impact as a means of enhancing the contribution of the scientific and engineering communities to human rights efforts;

3. Two information resources
   a. teaching modules on human rights generally and discipline-specific ways in which science and engineering have contributed to or led to violations of human rights
   b. review and update of the *Annotated Bibliographic Database on Science and Human Rights*.

We continue to work on the draft response to Article 15, which we expect to have completed in October. A summary of the July 2013 coalition meetings with

At the request of the editor of the Annotated Bibliographic Database, I prepared an annotated bibliography of resources on information science and technology and human rights, which will be included in the updated bibliography expected to be posted on the website in the near future. This project was very challenging, both because of the problems of defining the scope and because of the limits on the number of resources to be included. The bibliography is very much a work in progress, and I would greatly appreciate the comments and suggestions of ASIS&T members for what should be included. Anyone wishing to receive a copy of the draft is welcome to email me at tcarbo14<at>gmail.com.

As I continue to work on future updates to the entries, I would like to find an effective way to involve ASIS&T members in the revision and, more importantly, to create our own more extensive bibliography of resources on IST and human rights. In addition, there are many ways that ASIS&T members can be involved in this important work on human rights, and I welcome comments and suggestions on ideas and potential actions.
During the ASIS&T Board of Directors retreat this past July in Montreal, the ASIS&T McGill Student Chapter and France Bouthillier, director of McGill’s School of Information Studies, invited six board members to participate in a symposium on current and future trends in information science research. The board members generously agreed to provide a panel discussion to an overflowing room of 50 attendees, reviewing definitions of what the field is really about, warnings about current research practices in the field, and anticipated future directions in LIS research.

The panel was composed of past president Diane Sonnenwald, current president Andrew Dillon and president-elect, Harry Bruce. Three directors-at-large completed the panel: Katriina Byström, Sanda Erdelez and Diane Rasmussen Pennington. Panelists were not all in agreement on each point; for example, some were more pessimistic about the current state of LIS research than others. A summary of key points made during the two hours of presentation and discussion is provided here.

Defining the Field

Panelists presented three ways of defining our field and the work we do. Andrew Dillon argued that the role of our field today is to address the problems presented by our information society by tackling the human and policy solutions that are largely ignored in favor of technological or financial priorities by other fields and/or...
organizations. He commented, “We are not doing enough to draw students and new researchers into this area. Social questions are... important and may not be addressed if we are not involved.”

Dillon defined the core basics of our field as being about 1) information, 2) information organization through time and 3) designing information that matches user needs, stating that our field is not about context. The big research questions of our field are about whether we can empirically demonstrate issues and solutions related to those three core basics.

Harry Bruce stated that he takes an iSchool approach to defining our field, which is that our field is positioned where technology and information meet. New technical innovations trigger new questions and interest in how people deal with information in areas such as personal information management.

Interestingly, a third approach was provided by both Diane Sonnenwald and Katriina Byström. Sonnenwald described the role of LIS researchers and practitioners as infrastructure, using metaphors of midfield soccer/football players who support the front lines, and social networks to describe the essential connecting role we play. Byström suggested that the core idea in our field is facilitation. She gave the example that we in LIS could do more for the user in system design, as she sees great research potential in developing information systems for organizations and looking at how information can support decision-making.

Warnings and Exhortations to Researchers

Many in attendance at the symposium were students. As a result, the panel thoughtfully spoke to those in attendance about research practices to be avoided and practices to be cultivated. While some panel members emphasized certain items more than others, the overall discussion generated the following insights:

- Abandon navel-gazing for big questions
- Give careful consideration to ethics
- Consider the application of research
- Promote interdisciplinarity
- Develop good practices and valuable skills.

Abandon navel-gazing for big questions.

At the start of the symposium, Dillon defined navel-gazing research as the obsessive refinement of past questions while ignoring big research questions and called for an end to it. Other panel members forcefully echoed this call, including Bruce, who related it to the need for increased interdisciplinary work in building a “more dynamic research space” in our field, and Sanda Erdélez, who suggested that research questions should be more closely related to core issues of the field and that researchers should be quicker at figuring out research connections to social needs and trends.

Give careful consideration to ethics.

Sonnenwald took time to eloquently emphasize the need for ethics in all research endeavors, pointing out that brilliant research can be undermined or become meaningless without sufficient care for ethical issues. She highlighted the following areas where LIS researchers need to be aware of ethical challenges and practices:

- plagiarism
- dropping authors on papers in the journey from conferences to journal publications
- idea appropriation
- providing constructive and informative reviews
- treatment of colleagues
- honoring commitments made
- generosity in mentorship.

Consider the application of research.

Diane Rasmussen Pennington described how successful grant-writing in Canada relies on demonstrating in applications for funding how research has the potential to positively impact the lives of Canadians. She commented that we are advantageously positioned in LIS when making those arguments. She argued for an increase in industry-academic partnerships and their usefulness in translating research to practice, while acknowledging the challenges and tensions of those partnerships. She pointed out that the current valuation of faculty and researchers by universities can sometimes restrict or defeat such partnerships when, for example, the researcher needs a line item for a CV and as a result needs to be careful about research process, while the industry partner wants quick action.

She suggested that there are three things that should change in the future in order
to promote LIS research: 1) researchers being open to industry partnerships and 2) working with other fields to disseminate research while 3) faculty and universities reconsider what is important when reviewing applications for tenure and promotion.

Sonnenwald suggested that researchers consider what problems their research will address, then ask questions such as, What does a solution to this problem mean to people? What does it mean to societies?

Erdelez described how drawing connections between research and application is complicated by a moving social and technological landscape and commented that LIS has this challenge in common with other fields. She pointed out that the problem of translating findings into research is an information process and is potentially an area of research for our field that could help other fields.

In response to the panel members who spoke about the need to connect research to practical applications and social benefits, Byström argued that there is a flip side, which is to consider how research will help you, as a researcher, learn about yourself. Questions you might ask yourself include: How else could I have addressed this problem? What did I do wrong? How is my thinking affected? These insights are also valuable benefits that result from research.

In response to arguments for industry-academic partnerships, Dillon warned against danger of tailoring research and programs too much in order to respond to commercial pressures.

Promote interdisciplinarity. Bruce made an argument for an increase in interdisciplinary work and interdisciplinary representation in our faculties, in order to pull down research silos and facilitate entry into what he termed “dynamic research space.”

Byström pointed out that in an era of university department amalgamations, interdisciplinarity is sometimes forced upon us. The most pressing problem she perceives for interdisciplinarity is the potential conflict in philosophy behind theoretical issues and goals of research questions. She cautioned attendees to be flexible in their approach to this conflict, while maintaining respect for our field and our point of view, as well as that of other fields.

Develop good practices and valuable skills. Erdelez gave a hot-and-not list of research practices for attendees that included sage counsel for students as prospective and developing researchers. This counsel included encouragement to do the following:

- Sharpen skills and research methods
- Study well and do well
- Work on writing. Receive criticism well, ask questions and be willing to extensively re-write.
- Use personal information management tools now available to you as a researcher
- Try to lay a foundation of interpersonal and work skills by being the member of a research team.

Future Directions for LIS Research

In discussing the current state of LIS research, Dillon sees causes for optimism and pessimism. There is an unparalleled interest outside our field in information and information problems. At the same time, a weak research tradition has left us unable to respond to that interest (that need) in a compelling way, although he notes that LIS is not alone in this dilemma; other fields have the same problem.

In order to help resolve this problem, his suggestion is that the field needs to move beyond demanding respect or worrying about respect. Instead we need to go to our strength, which is that we are user-centered, that is, we regard information as a common good. He called for researchers to find big pressing information questions related to information, its organization over time and the design of information services to respond to user needs while taking into account policy issues and responding to those questions empirically.

Erdelez recommended to students looking for research topics that they “see where it hurts and where it hurts most.” Examples she gave of painful areas were personal-level information management or information security at a national level.

Bruce identified for the audience five topics that he believes will be the future of LIS research:

- Big data (although he dislikes this term)
- Information assurance and cybersecurity
- Digital youth
The role of information in creativity and innovation

Personal information management.

Pennington argued that in LIS programs there currently exist too many divisions, according to work context – for example, those master’s students intending to work in public libraries are often separated by curriculum, interest groups and so forth from students intending to pursue a PhD. One significant artificial divide that concerns her deeply is a technological divide, which allows some students to avoid technology in their schooling. She argues that technology should be better integrated into our study and practice and should not be a basis for divisions in the field as we go forward.

It should be noted that the event was held in a heritage building, which meant there was no air conditioning for our good-natured panel, whose members got to witness Montreal summer humidity during their presentations and then a Montreal summer thunderstorm during the social hour that followed. Our thanks go to the panel members for a wonderful event and to the moderator and originator of the event, France Bouthillier in her dual roles as the director of the School of Information Studies at McGill and the faculty advisor to the McGill ASIS&T Student Chapter.
The ISSI conference series is one of the prime events in scientometrics and informetrics and is organized under the auspices of the International Society for Scientometrics and Informetrics. The scope of this year’s ISSI was to “provide an international open forum for scientists, research managers, authorities and information professionals to debate the current status and advancements of informetric and scientometric theories and their deployment” (www.issi2013.org). In addition to the traditional evaluative focus, practical applications in related fields such as library and information science, history of science and philosophy of science were discussed.

This year, the European Doctoral Forum took place for the fifth time at an ISSI conference. Besides the Center for Doctoral Studies at the University of Vienna, ASIS&T SIG/MET and ASIS&T’s European Student Chapter were partner organizations. The primary objective of the European doctoral forum is to provide doctoral students with a platform for presenting and discussing their research projects with senior researchers and fellow students and to develop relationships with other scientists. This doctoral forum was organized by Ivana Roche from INIST (Institut de l’Information Scientifique et Technique) and Christian Schlögl from the University of Graz. Due to the limited time available (the forum took place between 9 a.m. and 4 p.m. on July 15), not all applications could be accepted. Finally, nine students from five different countries (Austria, Germany,
Hungary, The Netherlands and the United States) were invited. Interestingly, a few students were from organizations without a direct link to scientometrics or information science, but came from various other disciplines (computer science, economics, sociology). Also the presented topics were broad. They ranged from traditional themes like determinants of the research activity and efficiency in Russia and the Ukraine over the period 1993-2013 or research career systems to the use of altmetrics in research evaluation or the visualization of research fields based on scholarly communication on the web. Their quality is reflected in that a few of the doctoral students also presented in the regular program of ISSI 2013.

Each presentation lasted 30 minutes. In the first part the students presented their dissertation projects. The second part served for discussion and input. In order to give feedback to the students, the organizers were assisted by renowned scientometricians Peter Ingwersen, Jonathan Levitt, Ronald Rousseau and Cassidy Sugimoto.

One of the highlights of the European Doctoral Forum was lunch in a traditional Viennese cafe (Café Landtmann), which was sponsored by ASIS&T. Here, students had the opportunity to socialize and learn more about each other. Of course, the stay in Café Landtmann could not have been completed without having a cup of coffee selected from the wide range of their coffee specialties.
Information Architects: What We Do and How We Learn
by Thom Haller, associate editor for information architecture

EDITOR’S SUMMARY
Defining the field of information architecture is as challenging as ever, but this ASIS&T Bulletin special section includes several successful efforts from different perspectives. The lead article recasts the widely shared practice of organizing information resources as a discipline itself, building a commonly applicable model with widely understandable, generic terminology for broad implementation across diverse fields. The gap between formal education and real-life learning about information architecture is the focus of another article that presents a survey and audience feedback from World IA Day. Other contributions target the practical aspects of shepherding information content through organizational platform migrations, best accomplished by a multidisciplinary team with a common understanding of the information domain. Reflections upon 15 years teaching the subject of information architecture provide an opportunity to review lessons learned and consider how they apply beyond the field.

KEYWORDS
information architecture
organization of information
information resources management
migration
information mapping
information science education

A s a long-time instructor for information architecture and user experience classes, I often face the challenge of explaining what we do. My 90-year-old mother recently told me that she explains what I do by saying, “It has something to do with the Internet.”

She’s partially correct. Information architects have emerged during the past 20 years primarily because of the emergence of the Internet. But we also remain a profession whose practitioners spend a lot of time defining what we do and why we do it. At the IA Summit in Spring 2013, I spoke briefly with a colleague who had not attended a summit for a decade. “Has anything changed?” I asked him. “Technologies are new,” he responded, “but people are still trying to define the field.”

This special section of the Bulletin continues the quest to define our work. In the research article “Learning and Teaching Information Architecture: The Current State of IA Education,” Craig M. MacDonald summarizes information he and colleagues collected as part of the Information Architecture Institute’s World IA Day events in February 2013 as they explored the relationship among practical experience, classroom learning and theoretical knowledge. I also offer a few perspectives on classroom learning in my essay, “What Sticks: Reflections from 15 Years as an IA Instructor.”

Several other articles support the mix of theory and practice as well. John Heffernan and Paula Land share practical experience in “Information Architecture in Platform Migrations: Opportunity for Strategic Value” and “Migrations: Not Just for Developers Anymore,” respectively, while theoretical knowledge is provided by Robert J. Glushko, professor at the University of California, Berkeley, School of Information.

In his lead article, “Motivating a New Discipline of Organizing,” Glushko introduces us to his book The Discipline of Organizing. He reminds us that, as humans, we organize resources. These resources may range from

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ingredients in our spice cabinet or electronic records to animals or the zoo. We can emphasize how these examples differ, or we can attend to what they have in common.

Glushko encourages us to shift the conversation from using field-specific language to one based on organizing principles:

- We organize resources using easily perceived properties to make them easy to locate.
- We group resources that we often use.
- We make resources that we use frequently more accessible than those we use infrequently.
- We arrange resources alphabetically – according to their names.
- We arrange chronologically (arranging resources according to the date of their creation or other important event in their lifetimes).
- We either sort resources into predefined categories or combine resource properties to create new categories.

He also encourages us to be aware that the “we” arranging and organizing is just as likely to be a machine as it is a human:

“The organizing systems view no longer contrasts information organization as a human activity and information retrieval as a machine activity, or information organization as a topic for library and information science and information retrieval as one for computers that people contribute much of the information used by computers to enable retrieval.”

Does this shift how we explain our role to others? It could. Glushko concludes his article in this issue with an example of the practical implications of studying principles rather than field-specific language: “A student who says she knows about curation can’t as easily sell her skills to a business looking for someone to develop a business continuity plan as one who recognizes that ‘organizing resources and maintaining them over time’ is the skill the company wants and the one she has.”

Enjoy.
What do books in libraries, spices in kitchen pantries, boats in marinas, weather observations in a data repository, songs on a smartphone or music player, paintings in a museum, animals in a zoo and a professor’s lecture notes on his personal computer have in common?

At first glance, the answer seems to be “absolutely nothing.” This list contains highly diverse things that are selected and organized according to different principles, kept in different physical or digital environments and used for different purposes for different types of users.

But if we stand back a bit and take a more abstract look, we can see that all the things can be seen as the same thing. Books, spices, boats, weather data, music files, paintings, animals and lecture notes are all “resources” – “things that have value that can support goal-oriented activity” – that have been intentionally selected and organized. Similarly, despite their obvious differences, libraries, pantries, marinas, data repositories, recorded music collections, museums, zoos and computer folder and file hierarchies can each be described as an “organizing system” – “an intentionally arranged collection of resources and the interactions they support.”

A set of resources is transformed by an organizing system when the resources are described or arranged to enable interactions with them. Explicitly or by default, this transformation requires many interdependent decisions about the identities of resources; their names, descriptions and other properties; the classes, relations, structures and collections in which they participate; and the people or technologies that interact with them. These decisions and the analysis needed to make them have been systematized in The Discipline of Organizing, recently published by MIT Press in both print and eBook formats [1].

The Discipline of Organizing (TDO) compares and contrasts how
organizing takes place in different contexts and domains, presents common principles and design patterns and proposes that organizing systems typically follow a common life cycle of resource selection, organizing, interaction design, and maintenance. The book’s terminology is trans-disciplinary and generic in order to demonstrate its applicability to many different domains, with a great many specific examples that illustrate how organizing takes on many different forms even when the underlying principles remain the same.

I initiated the project to write TDO, assembled nearly 20 co-authors and guided them as the principal author and editor to create a book that defines a new field while respecting the essential contributions of the “feeder” disciplines – notably library and information science, computer science, informatics, cognitive science, law, economics and business. In this brief essay I will present the foundation ideas of TDO and describe the experiences we’ve had using the book in a diverse set of university courses in library science, informatics and “Information School” programs.

Organizing Is Ubiquitous, but We Rarely Think About It

Organizing is such a common activity that we often do it without thinking much about it. We organize the clothes in our closet, the books on our bookshelves, the tools in our garage and the folders into which we file printed and digital records for tax and other purposes. Quite a few of us have jobs that involve specific types of organizing tasks. We might even have been explicitly trained to perform them by following specialized disciplinary practices. We might learn to do these tasks very well, but even then we often do not reflect on the similarity of the organizing tasks we do and those done by others or on the similarity of those we do at work and those we do at home. We take for granted and as given the concepts and methods used in the organizing system we work with most often.

However, there is a cost to taking organizing for granted. The properties of resources you choose as the basis for organizing them make some interactions easy but might make other interactions difficult or even impossible. Arranging things by color and size makes sense in your clothes closet but not in your refrigerator. If you live alone, “frequency of use” is an effective organizing principle for your spices, cooking utensils and other resources in your kitchen, but if you have a roommate, any principle based on individual behavior rather than static resource properties is bound to cause conflicts.

A discipline of organizing provides concepts and guidance to make these day-to-day organizing activities more effective and even enjoyable. You might appreciate the aesthetic appearance of color-sorted books on your living room bookshelves more when you imagine the impossibility of using this organizing principle in a research library.

Organizing from a “Siloed” Perspective

No one reading an article in the Bulletin of the Association for Information Science and Technology would dispute that organizing is a fundamental issue in many professional fields. However, these fields have only limited agreement in how they approach problems of organizing and in what they seek as their solutions. For example, library and information science has traditionally studied organizing from a public sector bibliographic perspective, paying careful attention to user requirements for access and preservation and offering prescriptive methods and solutions. In contrast, computer science and informatics tend to study organizing in the context of information-intensive applications with a focus on process efficiency, system architecture and implementation.

In addition, we most often make distinctions about organizing on the basis of the type of resources being organized. We contrast law libraries from tool libraries, knowledge management systems from data warehouses and personal stamp collections from coin collections primarily because they contain different kinds of resources. Similarly, we distinguish document collections by resource type, giving them different names, as when we contrast narrative document types like novels and biographies with transactional ones like catalogs and invoices, with hybrid forms like textbooks and encyclopedias in between.

Finally, even though the activity of adding a resource to a collection occurs in all organizing endeavors, each of the “organizing professions” uses specialized vocabulary for describing it. For example, adding a resource to a library collection is called acquisition, adding to a museum collection is called accessioning and adding to an archive is ingesting. In
business information systems, adding resources could involve loading, integrating or inserting. Similar diversity in vocabulary occurs with the activity of maintaining the collection and interactions with it over time. Libraries and museums engage in preservation and curation, but the analogous activities with business information systems are often described as data cleaning, data cleansing, governance or compliance.

Introducing the Discipline of Organizing

Library and information science, informatics, computer science and other fields focus on the characteristic types of resources and collections that define those disciplines. This focus spawns disciplinary and domain-specific vocabulary that makes it challenging to apply concepts, methods and insights across disciplines.

In contrast, the fundamental premise of the discipline of organizing is that the diverse perspectives and concepts about organizing from its feeder disciplines can be subsumed and synthesized under a more abstract framework. TDO complements the focus on specific resource and collection types with a framework that views organizing systems as existing in a multi-dimensional design space in which we can consider many types of resources at the same time and see the relationships among them. TDO introduces five groups of design decisions, phrased in generic language to emphasize their broad applicability:

- What is being organized?
- Why is it being organized?
- How much is it being organized?
- When is it being organized?
- By what means is it being organized?

In the following sections I will briefly describe each of these decision dimensions.

What’s being organized?
What is the scope and scale of the resource domain? What is the mixture of physical things, digital things and information about things to be organized? Is the organizing system being designed to enable a resource collection to be created for an existing and closed resource collection, or for a collection in which resources are continually added or deleted? Are the resources unique or are they interchangeable members of a class?

Before we can begin to organize any resource we often need to identify it. It might seem straightforward to devise an organizing system around tangible resources, but we must be careful not to make assumptions about resources. In different situations, the same thing can be treated as a unique item, as one of many equivalent members of a broad category or as component of an item rather than as an item on its own. For example, in a museum collection, a hand-carved chess piece might be identified as an individual entity, as part of a set of chess pieces or be treated as one of the 33 unidentified components of an item identified as a chess set. When the resources being organized consist of information content, deciding on the unit of organization is challenging because it might be necessary to look beyond physical properties and consider conceptual or intellectual equivalence. A high school student told to study Shakespeare’s play *Macbeth* might treat any printed copy or web version as equivalent and might even try to outwit the teacher by watching a film adaptation of the play. To the student, all versions of *Macbeth* seem to be the same resource, but librarians and scholars make much finer distinctions.

Why is it being organized?

What interactions or services will be supported and for whom? Are the uses and users known or unknown? Are the users primarily people or computational processes? Does the organizing system need to satisfy personal, social or institutional goals? Does the organizing system have a limited timeframe, or must it and the resources it contains be maintained indefinitely?

Almost by definition, the essential purpose of any organizing system is to describe or arrange resources so they can be located and accessed later. The organizing principles needed to achieve this goal depend on the types of resources or domains being organized, and in the personal, social or institutional setting in which organization takes place. The fine distinctions between organizing systems that have many characteristics in common...
reflect subtle differences in the priority of their shared goals. For example, many organizing systems create collections and enable interactions with the goals of supporting scientific research, public education and entertainment. We can contrast zoos, animal theme parks and wild animal preserves in terms of the absolute and relative importance of these three goals, for example.

When the scale of the collection or the number of intended users increases, not everyone is likely to share the same goals and design preferences for the organizing system. In formal or institutional organizing systems conflicts between stakeholders can be more severe, and the organizing principles might even be specified in commercial contracts or governed by law. For example, physicians view the creation of patient records as central to diagnosis and treatment, while insurance companies think of them as evidence needed for payment and reimbursement and researchers think of them as primary data.

**How much is it being organized?**

*What is the extent, granularity or explicitness of description, classification or relational structure being imposed? What organizing principles guide the organization? Are all resources organized to the same degree, or is the organization sparse and non-uniform?*

The organizing system for a small collection can sometimes use only the minimal or default organizing principle of co-location – putting all the resources in the same container, on the same shelf or in the same email inbox. But as a collection grows in size, the time to arrange, locate and retrieve a particular resource becomes more important and the collection must be explicitly organized to make these interactions efficient. As a result, most organizing systems employ organizing principles that make use of properties of the resources being organized (for example, name, color, shape, date of creation, semantic or biological category), and multiple properties are often used simultaneously.

Unlike those for physical resources, the most useful organizing properties for information resources are those based on their content and meaning, and these properties are not directly apparent when you look at a book or document. Significant intellectual effort or computation is necessary to reveal these properties when assigning subject terms or creating an index. The most effective organizing systems for information resources often are based on properties that emerge from analyzing the collection as a whole. For example, the relevance of documents to a search query is higher when they contain a greater than average frequency of the query terms compared to other documents in the collection, or when they are linked to relevant documents.

Different preferences and disagreements between stakeholders in an organizing system about how much organization is necessary often result because of the implications for who does the work and who gets the benefits. Physicians prefer narrative descriptions and broad classification systems because those practices make it easier to create patient notes. In contrast, insurance companies and researchers want fine-grained, “form-filling” descriptions and detailed classifications that would make the physician’s work more onerous.

The cost-effectiveness of creating systematic and comprehensive descriptions of the resources in an information collection has been debated for nearly two centuries, and in the last half century the scope of the debate has grown to consider the role of computer-generated resource descriptions.

**When is it being organized?**

*Is the organization imposed on resources when they are created, when they become part of the collection, when interactions occur with them, just in case, just in time, all the time? Is any of this organizing mandated by law or shaped by industry practices?*

The organizing system framework recasts the traditional tradeoffs between information organization and information retrieval as the decision about when the organization is imposed. We can contrast organization imposed on resources “on the way in” when they are created or made part of a collection with “on the way out” organization imposed when an interaction with resources takes place.

The organizing systems perspective makes it easier to identify and apply the inherent tradeoffs between information organization and information retrieval that are obscured by the silos of traditional disciplinary and category perspectives. It is clear that the more effort put into organizing
information or other resources, the more effectively they can be retrieved, and the more effort put into retrieving resources, the less they need to be organized first.

**How or by whom, or by what processes, is it being organized?**

*Is the organization being performed by individuals, by informal groups, by formal groups, by professionals, by automated methods? Are the organizers also the users? Are there rules or roles that govern the organizing activities of different individuals or groups? Is this organization imposed in a centralized, top-down manner or in a distributed, bottom-up manner?*

Professional indexers and catalogers undergo extensive training to learn the concepts, controlled descriptive vocabularies and standard classifications in the particular domains in which they work. Many of today’s content creators are unlikely to be professional organizers, but presumably the creator best understands why something was created and the purposes for which it can be used. Non-creator users in the populace at-large are most often creating organization for their own benefit. Not only are these ordinary users unlikely to use standard descriptors and classifications, the organization they impose sometimes so closely reflects their own perspective and goals that it isn’t useful or accurate for others.

The organizing systems view no longer contrasts information organization as a human activity and information retrieval as a machine activity, or information organization as a topic for library and information science and information retrieval as one for computer science. Instead, we readily see that computers now assist people in organizing and that people contribute much of the information used by computers to enable retrieval.

In particular, machine learning is a subfield of computer science that develops and applies algorithms that accomplish tasks that are not explicitly programmed; creating categories and assigning items to them is an important subset of machine learning. Two subfields of machine learning that are particularly relevant to organizing systems are supervised and unsupervised learning. In supervised learning, a machine-learning program is trained by giving it sample items or documents that are labeled by category, and the program learns to assign new items to the correct categories. In unsupervised learning, the program gets the samples but has to come up with the categories on its own by discovering the underlying correlations between the items. Both approaches are fundamental as “big data” continues to spread like an epidemic from its roots in computer science into all the organizing disciplines.

**Designing an Organizing System**

The arrangements of resources in an organizing system follow one or more organizing principles, even if those principles are not explicit in the mind of the organizer. Organizing principles are directives for the design or arrangement of a collection of resources that are ideally expressed in a way that does not assume any particular implementation or realization.

When we organize a bookshelf, home office, kitchen or the MP3 files on our music player the resources themselves might be new and modern but many of the principles that govern their organization are thousands of years old. For example, we organize resources using easily perceived properties to make them easy to locate, we group resources that we often use together and we make resources that we use often more accessible than those we use infrequently. Commonly used organizing principles include alphabetical ordering (arranging resources according to their names) and chronological ordering (arranging resources according to the date of their creation or other important event in the lifetime of the resource). Some organizing principles sort resources into pre-defined categories and other organizing principles rely on novel combinations of resource properties to create new categories.

Expressing organizing principles in a way that separates design and implementation aligns well with the three-tier architecture familiar to software architects and designers: user interface (implementation of interactions), business logic (intentional arrangement) and data (resources).

The logical separation between organizing principles and their implementation is easy to see with digital resources. In a digital library it does not matter to a user if the resources are stored locally or retrieved over a network. How the resources and interactions with them are implemented are typically of little concern.

The separation of organizing principles and their implementation is harder to recognize in an organizing system that only contains physical
resources, such as your kitchen or clothes closet, where you appear to have unmediated interactions with resources rather than accessing them through some kind of user interface or “presentation tier.” Nevertheless, you can see these different tiers in the organization of spices in a kitchen. Different kitchens might all embody an alphabetic-order organizing principle for arranging a collection of spices, but the exact locations and arrangement of the spices in any particular kitchen depends on the configuration of shelves and drawers, whether a spice rack or rotating tray is used and other storage-tier considerations.

Categories {and vs. or} Design Dimensions for Organizing Systems

We can always create new categories for organizing systems by stretching the conventional definitions of *library* or other familiar ones and adding modifiers, as when Flickr is described as a web-based, photo-sharing library, or when we describe a collection of seeds for heirloom varieties as a “seed library” or “seed bank.” But whenever we define an organizing system with respect to a familiar category, the typical or mainstream instances and characteristics of that category that are deeply embedded in language and culture are reinforced, and those that are atypical are marginalized. In the Flickr case this means we suggest features that are not there (like authoritative classification) or omit the features that are distinctive (like tagging by users).

A similar categorization challenge arises with the Google Books digitization project. Google co-founder Sergei Brin characterized its ambitious project to put tens of millions of books from research libraries online as “a library to last forever.” But the Google Books project was widely criticized as not being true to library principles. We can readily identify design choices in Google Books that are more characteristic of the organizing systems in business domains, and the project might have been perceived more favorably had it been described as an online bookstore that offered many beneficial services for free.

In contrast, *TDO*’s dimensional perspective acknowledges the diversity of instances of collection types and provides a generative, forward-looking framework for describing hybrid types that do not cleanly fit into the familiar categories. Even though it might differ from the conventional categories on some dimensions, an organizing system can be designed and understood by its “family resemblance” on the basis of its similarities on other dimensions to a familiar type of resource collection.

Thinking of organizing systems as points or regions in a design space makes it easier to invent new or more specialized types of collections and their associated interactions. If we think metaphorically of this design space as a map of organizing systems, the empty regions or “white space” between the densely populated centers of the traditional categories represent organizing systems that do not yet exist. We can consider the properties of an organizing system that could occupy that white space and analyze the technology, process or policy innovations that might be required to let us build it there.

Benefits of “Spanning the Silos” with Broader Concepts and Vocabulary

I teach in the School of Information at the University of California, Berkeley, which like most of the iSchools has a multidisciplinary curriculum and a diverse student population. iSchools often mix students with library science, computer science, social science or engineering undergraduate degrees in the same courses – even when the students have equally diverse career objectives. When we teach organizing using traditional library science or computer science texts, which narrowly focus on the concepts and terminology of a particular academic discipline and problem domain, students from other backgrounds have some difficulty. In contrast, teaching organizing from *TDO*’s broader perspective that emphasizes what different academic disciplines and domains have in common makes it easier for students with different backgrounds and working in different domains to understand and learn from each other.

Berkeley is just one of many iSchools or departments in similar fields that has adopted *TDO* as a core text or that is using it as a supplementary text to broaden and deepen the syllabus in more traditional courses in information organization or content management. These schools currently
include Colorado, Humboldt, Illinois, Kentucky, Michigan, North Carolina, Rhode Island, Rutgers, St. Louis and Texas.

All of us teaching with *TDO* recognize that it can sound odd to describe the animals in a zoo as resources, to think of viewing a painting in a museum as an interaction or to say that destroying information to comply with privacy regulations is maintenance. But part of what a database administrator can learn from a museum curator follows from the rich associations the curator has accumulated around the concept of curation that are not available around the more general concept of maintenance. Without the shared concept of maintenance to bridge their disciplines, this learning could not take place.

A very practical implication of teaching organizing using more generic concepts and vocabulary is that it enables students to obtain jobs with firms that might not otherwise hire them. A student who says she knows about curation can’t as easily sell her skills to a business looking for someone to develop a business continuity plan as one who recognizes that “organizing resources and maintaining them over time” is the skill the company wants and the one she has.

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**Resource Mentioned in the Article**

Since the late 1990s, the field of information architecture (IA) has played a pivotal role in shaping the structure and organization of the Internet. Although the term information architecture has been around for decades, the rise of IA as an established profession was aided in large part by the publication of Peter Morville and Lou Rosenfeld’s Information Architecture for the World Wide Web [1] – affectionately known as the “Polar Bear Book” due to the presence of a polar bear illustration on its cover – in 1998. Morville and Rosenfeld’s work was important not just because it was one of the first mainstream books to use the term information architecture in the context of hypertext information systems, but also because it presented core library and information sciences (LIS) concepts, including taxonomies, organization schemes and information retrieval systems, as fundamental components of IA. The perpetuation of web-based information services and a LIS-focused brand of IA was not a coincidence, as the application of LIS expertise to the design of information-rich websites was (and is) practically and theoretically consistent with the core of the LIS discipline.

The widespread popularity of IA in the late 1990s and early 2000s prompted a great deal of interest in IA within the LIS community (for example, Dillon [2]) and it remains an important topic of discussion in the field today (see, for example, Dade-Robertson [3]). But while LIS played a major role in building IA as a profession, treating IA as a purely LIS-based discipline is not entirely accurate. Structuring and organizing information-rich, web-based hypertext systems is still a critical IA task, but the increasing pervasiveness of digital interfaces has led to a much broader challenge: designing cross-channel, multi-screen experiences that deliver...
different types of information in volumes and ways that are difficult to predict as explained by Resmini & Rosati [4]). The complexity of this challenge has expanded the scope of the field, leading to an influx of professionals who have diverse disciplinary backgrounds (including, but certainly not limited to, LIS) but who are still tasked with solving IA problems. The multidisciplinary nature of the field is recognized by Morville and Rosenfeld who, in the latest edition (2007) of Information Architecture for the World Wide Web, state that “no single discipline is the obvious source for information architects” (5, p. 19), and they list nine potential disciplinary backgrounds for an information architect, including graphic design, LIS, journalism, marketing and product management, among others. This diversity is also evident in their survey results, as just 48% of respondents said they received formal education in IA or a related field (with 19% of respondents holding a degree in library science, the highest percentage of any discipline).

In summary, the LIS discipline helped to establish the practice of IA but there are an increasing number of professionals with non-LIS backgrounds who are doing IA work. This state of affairs gives rise to critical questions facing IA educators, researchers and practitioners: how do people learn to do IA? And, in turn, how do we (and should we) teach IA?

Data Collection at World IA Day 2013

As one of the Information Architecture Institute’s signature events, World IA Day (WIAD) celebrates the practice of IA through a series of synchronous but independent events at various locations throughout the world. WIAD 2013 was held on Saturday, February 9, and consisted of 15 official events (one for each year since the 1998 publication of Morville and Rosenfeld’s work) and six unofficial “grassroots” events. In a sign that IA has global reach, events were held in 15 countries across six continents: North America (United States, Canada), South America (Argentina, Brazil, Colombia), Asia (Japan, United Arab Emirates), Europe (UK, France, Italy, Poland, Belgium, Hungary, Romania), Africa (South Africa) and Australia (Canberra). Although WIAD is a global event, each individual location is responsible for defining the scope and format of the local events, which typically include keynote presentations, panel discussions, interactive workshops and/or small group breakout sessions.

Early in the planning process, the New York City production committee (of which the author was a member) was inspired by the high concentration of IA and IA-related courses offered in the New York City area (including New York University, Parsons the New School for Design, Pratt Institute and the School of Visual Arts) and decided to organize a session focused on IA education. Although the idea began as a traditional panel discussion, it soon became apparent that the WIAD event presented a unique opportunity to open a dialogue with the IA community about how and where people typically learn to do IA. The end result was the first-ever town hall meeting focused exclusively on IA education. In preparation for the meeting, an online survey was developed and distributed to all registered attendees for the New York City WIAD event. Due to a low initial response, the survey link was then more widely distributed to the IA community via Twitter and the IA Institute e-mail discussion list. Survey questions addressed demographic characteristics (age, gender), professional experience, educational background and perceptions/recollections about IA-related educational experiences. Results of the survey and town hall discussion are presented in the following sections and provide a snapshot of the current state of IA education.

Survey: Quantitative Results

The online survey received a total of 130 complete responses from 13 different countries, although a majority of respondents (68%) were located in the United States. Respondents were split fairly evenly between females (52.8%) and males (47.2%) and represented several different age brackets, with 40% under 35 years of age, 55% between 35 and 54 years of age, and 5% over 55 years of age. The vast majority of respondents (84%; 109) reported doing IA work in a professional capacity, including 26% (28 of 109) who reported being employed as an information architect, 61% (67 of 109) who worked in the UX profession and did IA as part of their job and 13% (14 of 109) who worked outside of the UX profession and did IA as part of their job. Of the respondents who were doing IA work in a professional capacity, 27% (29 of 109) had three years or less of IA experience, 25%
(27 of 109) had between four and six years of experience, and 48% (52) had seven or more years of experience. Overall, the respondents were a diverse mix of age groups, experience levels and professional affiliations.

From an analysis of the respondents’ educational backgrounds, it is abundantly clear that people who do IA are generally well educated. Of the 126 respondents who answered this question, all but four indicated they had earned at least a bachelor’s degree and approximately 60% (75 of 126) indicated they had earned at least a master’s degree. However, just 33% of respondents (42 of 126) had educational backgrounds in IA-related disciplines (such LIS, HCI and interaction design), including nearly 20% of the respondents (25 of 126) who reported earning the MS LIS degree, the most common degree listed.

To further examine respondents’ educational backgrounds, each respondent was placed into a broad disciplinary category based on his or her highest degree achieved (see Table 1). The results show that information/library science was the most frequent disciplinary background, but it was far from being a consensus, as just 23% of respondents had LIS-related degrees. The second most frequent discipline was social/behavioral science (17%), followed by design (12%) and the humanities (12%). No other academic background was shared by more than 10% of respondents, providing further evidence that IA is truly a multi-disciplinary profession.

Despite the variety in disciplinary backgrounds, a majority of respondents (52%; 68 of 130) reported taking a college or university course that was either partially or exclusively about IA. Disciplinary background seemed to be the strongest indicator of whether a respondent had taken a course about or related to IA: just 17% (7 of 42) of respondents with an IA-related academic background had not taken an IA course, compared to 63% (55 of 88) of respondents with a non-IA related background such as humanities or social/behavioral science. There seemed to be little connection between IA-related academic experiences and professional status, as 43% (12 of 28) of the professional “information architects” who responded to the survey had no academic exposure to IA at all (had a non-IA academic background and had never taken an IA-related course).

With a relatively large portion of the IA community seemingly receiving little or no academic training in IA, it is not particularly surprising that most IA/UX professionals learn IA from a variety of sources (see Figure 1), with a majority learning “on the job” (83%; 90 of 109) and/or “on their own” (73%; 80 of 109). Just 28% of IA/UX professionals (30 of 109) said “in school,” which is surprisingly low when compared to the percentage of respondents who took an IA-related course (52%). Even more surprising is that just 54% of UX/IA professionals who had taken an IA-related course (29 of 54) also

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**TABLE 1. Disciplinary backgrounds of survey respondents.** Percentages are based on responses from 126 respondents.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information/Library Science</td>
<td>29</td>
<td>23%</td>
</tr>
<tr>
<td>Social/Behavioral Science</td>
<td>21</td>
<td>17%</td>
</tr>
<tr>
<td>Design</td>
<td>15</td>
<td>12%</td>
</tr>
<tr>
<td>Humanities</td>
<td>15</td>
<td>12%</td>
</tr>
<tr>
<td>Art</td>
<td>11</td>
<td>9%</td>
</tr>
<tr>
<td>Business</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>Human-Computer Interaction</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>Mathematics/Computer Science</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>None (i.e., no degrees earned)</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Education</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Physical Science</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Architecture</td>
<td>1</td>
<td>1%</td>
</tr>
</tbody>
</table>

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**FIGURE 1.** Chart showing the percentage of IA professionals who learned how to do IA from specific sources. Percentages do not add to 100% because respondents (N = 130) could select multiple answers.
said they learned how to do IA “in school,” suggesting that even those who do have academic IA training may not feel it is particularly effective.

As further evidence that IA cannot be learned in school alone, all but one of the 30 respondents who said they learned how to do IA in school said they also learned it from at least one other source, with a majority (90%; 27 of 30) saying they also learned it “on the job.” Overall, 83% of respondents (90 of 109) said they learned IA from at least two sources, including 58% (63 of 109) who marked three or more sources. Looking at it another way, almost three-quarters of all IA/UX professionals (73%; 79 of 109) said they learned how to do IA outside of a traditional academic setting, which implies that there may be some barriers to learning IA in an academic setting.

Survey: Qualitative Data

So far, the quantitative data have shown that 1) many IA professionals have not had any academic exposure to IA and 2) even those who did have academic IA training reported learning it from non-academic sources. To probe this issue further, the survey also included three open-ended questions regarding respondents’ perceptions of IA education. The first open-ended question asked respondents to reflect on their own academic experiences and whether there were any topics or concepts they wish they had learned in school before they started doing IA. A total of 73 respondents provided usable answers to this question (9 respondents indicated that there was nothing else they wish they had learned, and these responses were excluded from the analysis). As presented in Table 2, 64% (47 of 73) of those respondents listed concepts that were theoretical in nature and 40% (29 of 73) listed more practical concepts (note that the percentages in Table 2 do not add to 100% because respondents could list multiple concepts). Concepts from design and LIS were the most frequently cited, but no other topic was mentioned by more than 10 respondents. This lack of consensus is likely a byproduct of the diversity of academic experiences and perspectives among IA/UX professionals.

The second open-ended question asked respondents to offer their advice on learning IA. From the 95 usable responses, the general consensus was that self-teaching was the preferred method: learning “by doing” was the most common advice, as 63% of respondents (60 of 95) mentioned learning IA directly through hands-on experience (for example, “Do it, do it again, do it again. Have empathy for users. Copy/learn/repeat” and “Design stuff, watch people use it and then fix it.”). Coming in a close second place was learning “by reading,” with 61% (58 of 95) of respondents mentioning studying popular IA texts, including books, blogs and other publications (for example, “Self-teach yourself, read books, blogs and follow UX people on twitter” and “Read blogs, study what you think is good/bad, grab some books!”). Not surprisingly, Morville and Rosenfeld’s Information Architecture for the World Wide Web was mentioned by six respondents and was the only publication mentioned multiple times. Other advice for learning IA included taking a class (29%; 27 of 95), finding a mentor (18%; 17 of 95) and attending professional networking events like conferences and meet-ups (17%; 16 of 95). Most respondents (65%; 62 of 95) suggested two or more approaches to learning IA, and those who offered a single approach overwhelmingly favored practical or self-directed learning approaches (just one respondent mentioned academics alone). In addition, it’s worth noting that the few respondents who mentioned academic options may have been referring to non-traditional educational organizations (such

<table>
<thead>
<tr>
<th>Concept</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Concepts</td>
<td>47</td>
<td>64%</td>
</tr>
<tr>
<td>Design (General)</td>
<td>15</td>
<td>21%</td>
</tr>
<tr>
<td>Information/Library Science</td>
<td>14</td>
<td>20%</td>
</tr>
<tr>
<td>Psychology/Cognitive Science</td>
<td>6</td>
<td>8%</td>
</tr>
<tr>
<td>Math/Analytics</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>Research Methods</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>Other Theoretical Concepts</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td>Practical Concepts</td>
<td>29</td>
<td>40%</td>
</tr>
<tr>
<td>Role/Definition of IA</td>
<td>8</td>
<td>11%</td>
</tr>
<tr>
<td>Coding/Web Development</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td>General IA (e.g., deliverables)</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Teamwork &amp; Communication Skills</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Other Practical Concepts</td>
<td>7</td>
<td>10%</td>
</tr>
</tbody>
</table>
as General Assembly) or continuing education courses or workshops taught through professional organizations (such as the IA Institute). Just five respondents specifically mentioned traditional higher education (for example, “Get a good graduate degree” or “go to an information school for a master’s”), but all of these respondents also noted the importance of getting hands-on experience (e.g., “I would suggest a combination of pedagogic education such as a graduate program at an information school, along with working as a junior IA on a very large web content management system integration”).

The general sentiment — that learning IA requires a multi-faceted approach grounded in practical experience — is perhaps best encapsulated by the respondent who wrote, “[Learn] every way that you can. Read books and articles, set practical learning challenges, attend conference workshops, go to IA meet-ups, contact people through LinkedIn, join professional organizations and use every feature they offer. Volunteer at nonprofits, small business, friends and families. Create a portfolio, ask for advice.”

In the absence of any formal connection to a sole academic discipline, it’s not particularly surprising that hands-on experience and self-directed study are the preferred methods for learning IA. But if, as these data suggest, formal education is not seen as an ideal way to learn IA, what role (if any) can it play in preparing IA professionals? The third — and final — open-ended question addressed this issue directly and received 84 usable responses.

Although a content analysis of the responses did not yield a true consensus about the role of formal education, four themes emerged around what formal education can (and should) provide for aspiring IAs. A brief description of each theme is provided below (please note that percentages will not add to 100% because respondents could address multiple themes in their answers).

A dominant theme that emerged was the value of providing a broad base of knowledge about the field and its (many) related disciplines. Specifically, 29% respondents (24 of 84) stated that formal education provides an introduction to IA as a field, giving students “a foundation to have similar language” and “a base of knowledge that helps [them] be productive and smart on day 1 [sic].” Few respondents described exactly what that foundation would or should be, but the general sentiment was that education “both introduces and trains students to learn about this field, its benefits and needs, and trains them to operate in it successfully.” A related theme, mentioned by 19% of respondents (16 of 84), was that education should address the theories and concepts essential to good IA. Some respondents listed specific LIS concepts (e.g., “cataloging/classification [and] taxonomy” and “the basics of how people seek, browse, find and obtain information”), but theories/concepts from other disciplines were also mentioned, including design, cognitive psychology and statistics. This strong focus on foundational knowledge and concepts is likely a big reason why some respondents (8%; 7 of 84) felt that education can provide an entryway for beginners, teaching them “not to be scared of [IA]” and giving students “a big head start” when entering the field.

Despite a heavy focus on theoretical concepts, a second theme stressed the importance of connecting academic study with professional practice. Several respondents (16%; 13 of 84) felt that formal education should be “integrated with real world opportunities” because “real world experience is better than hypothetical situations (especially due to scale).” Although many respondents remarked that theory can be useful, they also noted that “[theoretical foundation] should be paired with real world experience – lots of it – [because] there’s no substitute for experience.” Others were more explicit about the practical value of academic study, with some respondents (6%; 5 of 84) describing formal education as an important credential for getting into or moving up in the profession.

Combining theoretical knowledge with practical experience is obviously critical to any formal IA education program, but a third theme was related to the advantages offered by classroom learning. In particular, 14% of respondents (12 of 84) noted that formal education gives students opportunities to develop a number of skills that are useful in practical settings, such as research, writing, speaking/presenting and “doing the ‘boring’ tasks that require structured analysis, like inventories.” Additionally, 11% of respondents (9 of 84) described the classroom as a “safe environment,” or a place that offers expert guidance and exposure to a variety of different contexts while also encouraging “freedom to play and learn” and allowing “early and frequent failure.” Finally, some respondents (14%; 12 of 84) extolled the virtues of formal education in general, noting how education
“open the mind” and teaches students to “learn to think outside the box” and “think both logically and creatively.”

Finally, a fourth theme that emerged was that formal education cannot – and should not – be the only path into the profession. Many respondents (17%; 14 of 84) described formal education as just “one avenue to accumulating the knowledge necessary to work well in the field” because “not having a direct study of the subject doesn't preclude someone from excelling at a job as an IA.” Some respondents (6%; 5 of 84) highlighted the importance of learning on their own (“practical hands-on skills are often best learned on the job”), while others (5%; 4 of 84) argued that being good at IA requires innate talent that cannot be taught in school (“I think people are born with the ability to practice IA. You either have the mindset and characteristics or you don’t.”). A few respondents (5%; 4 of 84) also mentioned the importance of non-traditional options such as courses through General Assembly or training through professional organizations like the IA Institute such as conferences, workshops, seminars and mini-courses. In other words, these respondents felt that formal education can play a prominent role in preparing people to do IA, but other pathways are equally valuable and are important for maintaining the multidisciplinary perspective that is integral to growing and shaping the profession.

Town Hall: Results

While exact participation numbers for the town hall session are not available, nearly all of the over 130 people who attended New York City’s 2013 World IA Day (WIAD) event were present for the town hall session. The session was organized around two main themes, learning IA and teaching IA, with a 45-minute moderated discussion around each theme. Four IA educators – Abby Covert, Carl Collins, Alex Wright and Katie Koch (from Parsons The New School for Design, New York University School of Continuing and Professional Studies, and the School of Visual Arts, respectively) – acted as co-moderators for the session. For each theme, the co-moderators began with brief opening statements and then opened up the floor to the audience for discussion. Student volunteers passed around microphones to anyone wishing to speak and audience members also had the option of writing comments or questions on index cards that were passed along to the moderators. To track and provide a record of the discussion, two student volunteers took notes on large flip-boards located on either side of the room and Amanda Lyons from Visuals for Change took “sketchnotes” of the conversation and shared them over Twitter in real-time.

The first half of the session focused on learning IA and included the following discussion prompts: “If I were hiring someone to do IA, I would want them to know…” and “For a newcomer, the best way to learn IA is by…” Echoing the themes that emerged from the survey responses, town hall participants noted that while a master’s degree can be useful, nothing can trump practical experience. Thus, this portion of the town hall session featured a long discussion about the IA/UX portfolio, which is increasingly seen as a prerequisite for any professional IA/UX position and is thought by many to be the best learning and preparation tool for aspiring IAs. A “good” IA/UX portfolio was described primarily as a mechanism to showcase a candidate’s communication skills through 1) displaying his/her understanding of the jargon/language of the profession and 2) highlighting his/her ability to adapt and respond to constructive feedback throughout the entire end-to-end product development process. Participants acknowledged the natural tension between requiring practical experience before getting a professional position and offered several potential solutions, such as mentoring (through the IA Institute), enrolling in continuing education courses (through General Assembly) and/or doing volunteer/freelance work (independently or with a mentor). In addition to building a portfolio, participants also explained that practical experience is the only way to hone many of the skills necessary to do daily IA work, such as working in multidisciplinary teams, selling and defending your ideas, communicating with stakeholders and understanding the business impact of IA/UX decisions. In general, the first half of the town hall discussion reinforced the notion that practical experience is the most effective way to prepare for a career in IA. Interestingly, the only mention of formal IA education was when a representative of the IA Institute shared information about the Institute’s list of academic courses and programs specializing in IA.

The second half of the session focused on teaching IA and included the
following discussion prompts: “If I were teaching a college course in IA, I would teach students how to…” and “If I were teaching a college course in IA, the required topics or readings would be…” Consistent with the survey results, the general consensus from the participants was that hands-on experience must be integrated into IA courses and programs in order for the degree to be a meaningful and useful credential. Participants believed that theoretical concepts were important but that it’s even more important to apply theory to solve real-world problems and practice important skills. In particular, participants felt IA education programs should cover theories/concepts, but that building and critiquing portfolios should also be an important focus, as should how to evangelize or teach IA within organizations (the impact of IA on business goals, how IA fits into the software development cycle and so forth). There was little discussion about the specifics of how to actually teach IA, with participants listing broad topic areas (ethnography, accessibility, architecture and software development) and only a few recommended readings (Universal Principles of Design and 101 Things I Learned in Architecture School). To summarize, the second half of the town hall session again highlighted the importance of practical experience in learning to do IA, with participants favoring a blend of theory and practice but with strong emphasis on hands-on experience.

Conclusion

Survey respondents and town hall participants expressed a general belief that practical experience is the best way to learn IA and, therefore, formal education cannot (and should not) be the only pathway into the profession. Academic study can offer many benefits as long as it covers foundational theories and concepts and creates a flexible but safe learning environment for students, but it can only provide value if it offers hands-on learning experiences. The survey data also showed that while most IA professionals are highly educated, they come from a wide variety of academic backgrounds (many of which are unrelated to IA) and even those who do have an IA-related academic background were more likely to learn IA independently (on the job or on their own) than in the classroom. The end result is that the responsibility of educating new and aspiring IAs invariably falls to the senior members of the field, creating an unbalanced relationship between the academy and industry. Senior IAs are more than qualified for the job, but educating new IA professionals in addition to performing regular day-to-day duties is an unnecessary burden and has the danger of creating a professional community whose members lack a shared identity. With the field becoming increasingly diverse and its challenges increasingly complex, the academic community must take action to strengthen IA educational options and reduce the burden placed on practitioners.

The first and most important step is eliminating the disconnect between what IA education is and what it should be. The exact cause of this disconnect is unclear, but a strong hypothesis is the lack of consensus about the “core” of IA as a profession, which likely stems from the fact that IA professionals come to the field with a variety of disciplinary perspectives and experiences. In other words, the problem is not just that IA education courses struggle to blend practice with theory (although that does present a considerable challenge) but rather that it is unclear what constitutes IA “theory” and IA “practice” in the first place. For instance, when town hall participants stressed the importance of “practical experience,” they provided few details about the specific tasks and skills that should be learned. And, when survey respondents described the value of learning the “theoretical foundations” of IA, they offered only vague or general descriptions of what that foundation should be. In other words, there is little discussion and, presumably, little consensus about what constitutes the core of IA: the concepts, topics and skills that provide the theoretical and practical foundation of the profession. Without a clear definition of IA’s core concepts, topics and skills, IA academic programs will struggle to meet the needs of the professional community, and the professional community will again be forced to adopt informal, ad hoc approaches to teaching its members how to do IA, which runs the danger of fracturing the field into small, specialized subgroups with competing agendas.

Some of IA’s brightest minds are already tackling this challenge, looking beyond IA’s traditional roots in LIS. For instance, some such as Davis [6] are looking to the field of architecture to explore the concept of “structure” in information spaces or how IA can be re-framed as a process of
understanding and meaning-making rather than structuring and organizing (Royce & Klyn [7]). These efforts show promise, but many survey respondents and town hall participants described IA as a multidisciplinary profession that draws knowledge and expertise from a variety of topic areas. Thus, it’s possible that the theoretical and practical foundations of the field lie outside of traditional disciplinary boundaries and cannot (and should not) be limited to a single area. The answers will not come from academia or industry alone, or even one discipline alone, but will instead require an interdisciplinary collaboration among universities, professional organizations and even non-traditional educational organizations. In a world where complex multi-channel interactive experiences are the norm, it is imperative that professionals and educators grapple with these questions as we shape IA education for the future and prepare IA practitioners for the unknown professional challenges that lie ahead.

Resources Mentioned in the Article

What Sticks: Reflections from 15 Years as an IA Instructor
by Thom Haller

For 15 years, I taught information architecture classes to “graduate students” in Washington, D.C. Unlike most graduate students – people pursuing an advanced degree – these students enrolled in 10-week classes to explore new ideas and interact with others interested in the same subject matter.

I began teaching the class in the fall of 1998 with colleague Steve Ritchey (@steveritchey). We shared a passion for making the complex clear, buoyed by the emerging Internet and web structure we believed could improve. At the time, web resources were few. Web Pages That Suck topped the web geek’s best-seller list. But from the very beginning, we were armed with a text – Rosenfeld and Morville’s Information Architecture for the World Wide Web (the so-called “Polar Bear book,” from the illustration on its cover) – a resource to which we were able to refer for the entire 15 years of the course.

Performance Focus

From the beginning the course was structured in a performance-focused framework. Students identified goals for the class and worked to accomplish them. Goals, like students, differed. Flipping through a list of goals, I note that some were very focused:

- Gain an understanding of the principles of IA and their various manifestations in the world around me
- Determine if this is a career direction I would like to pursue
- Apply principles of information architecture outside of websites – for example, print documents, airports, cubicles, etc.

Other goals were more immediate:
Learn techniques for making information more accessible (and apply those techniques to my current project)
And others …
Develop a strategy to perpetuate optimization as paradigms progress and technological advancements allow increasing accommodations to security classifications.
…took a while for me to process.

Instructional Challenges
My instructional challenge was to provide content in coherent wholes that built upon previous lessons learned. I always reserved our final class in Week 10 for student presentations. Students would often present a research idea they were exploring, synthesize a practical assignment they were accomplishing – often for the employer who was funding the class – or report back on a class (group) project exploring real-world architectural challenges and providing recommendations or solutions.

How could we all travel effectively from Week 1 (introductions and overview) to Week 10 (final presentations and a class party)? We used the syllabus to guide our journey, and we used a class conversation we called “What sticks?” to serve as glue from week to week.

The syllabus always began with an opportunity for students to interact and explore their perceptions of the field. Obviously, this exploration incorporated reading from texts (a variety of recommended texts supporting the Polar Bear book), but also included interviews with information architects. It was not uncommon for guest speakers – frequently a panel – to visit with us early in the course to talk about their experiences as information architecture professionals.

I framed the class as a quest for useful knowledge: What happens in humans’ heads when we use information? What are strategies for helping them out? What framework can we adopt for envisioning users? What research techniques can we adopt? What political hurdles do we cross? What enables humans to get their jobs done? The class provided a link between information structure and human experience.

During the early weeks of class, we spent a good bit of time talking about humans – we’d explore what happens in their heads as they use information and make their way through the world.

I clustered content using the mnemonic GAIN (humans think Graphically, they seek to Act, they look for Interconnections and they try to Navigate). Students explored each concept – getting lost in visual information, trying to accomplish tasks in think-aloud protocols, articulating different organizational relationships and exploring mental models and patterns.

I was fortunate to come upon a quote by Albert Einstein that helped frame my thinking for the class. Apparently, a colleague asked him why Einstein was asking students the same question in the final exam that he had asked the year before. “Because the answer has now changed,” he responded. Similarly, IA conversations constantly changed, and I often benefitted from guest speakers following (or leading) these changes.

Guests took on different topics: incorporating cognitive research, developing search systems, communicating design, identifying and using patterns, developing intranet systems, using different research methods, conducting card sorts, sketching, running usability tests, using remote testing tools, comparing research methodologies and practices, designing a content strategy, developing responsible design, optimizing search results with metadata, incorporating accessibility thought – I would thank all our guests by name, but I’m not prepared to leave anyone out.

You may wonder how students could maintain focus in a class with such disparate topics. I owe a lot of our camaraderie and success that emerged from a beginning-of-class conversation in which we discussed “what sticks.”

For our “graduate” (work-world adult) classes, folks would arrive in class harried from a long day at the office. To help reacclimate students to the lesson topics of the day, I would begin by asking, “What sticks from your reading?” “What sticks from your individual study or project work?” “What sticks from your real-world job experiences this week?”

Students had to synthesize their week-gone-by experiences or relate an “aha moment.” Some classes turned into therapy encounters. Students would face obstacles on the job, take a lesson from class back into the workplace and emerge with new installments in their experience.
At the conclusion of our 10 weeks together (if time allowed), we would reflect on “what sticks” from the entire course. Here’s an example of a class summary:

About the field:
- Integrated field with no discrete boundaries.
- There is value in being a generalist (and the UX community offers that option).
- Work offers silos. The class provides community and breaks down the walls.
  - You might spend all your time working on something, but it may be useful.
  - Community helps.

About user experience:
- The user experience touches every aspect of your life.
- Content plus structure = communication.
- We need to be the user’s voice — so we need to understand who our audience is and what they want to do.

About our practice:
- We must think about context and politics as we look for solutions.
- Everything on the website matters.
- There is an art in the presentation of information and the amount of detail and placement of information matters to users.
- We can highlight those topics/areas that matter to others.
- Patterns, patterns, patterns.
- Many opportunities for continued learning (this is exciting).
- Breadth is good – the label “IA” can be narrow. But the skills are broad (they matter).
- Tools, thinking, approaches all come together.
- We have an opportunity to present and refine stories.
- Having this knowledge is power (makes projects successful).
- We have the power to articulate what we feel about design and interaction.
- Finding vocabulary, finding research, matters.
- Thinking matters.

What Sticks Now
In assembling this article for the *Bulletin*, I reached out to some former students and asked them “what sticks” from having participated in the class.

- More than anything, what sticks for me – as one who hasn’t been a part of the professional online world for several years – is how relevant IA/UX principles are to my work. As a writer and editor, I’m equally concerned with my audience and how I can provide an experience that makes them receptive to what we ask them to read and hope they’ll do. Every day, I think about those principles, use them in my work and try to instill them in my colleagues.
- What sticks for me? I’m still going with the Remove, Organize, Hide, Displace advice from Giles Colborne’s book, *Simple and Usable*. I’ve been doing a lot of mockup work lately, and those four directives are often on my mind as I’m working through the process of developing those. That book was also the first thing that sprang to mind at a meetup I attended last week when someone in the group asked the panel to name the book that really got them interested in doing UX – the book that they recommend others to read about UX.
- As an archivist (during the class and since), I deal with IA/UX in the context of making information accessible to users through catalogs, websites, brochures, and also interacting directly with patrons’ reference requests. What sticks for me is everything. At the recent national archivist conference, I attended a session on UX with digital primary sources and the theme for students of information architecture. I am currently working with a sizable oral history collection, designing our publicly available information in such a way that our cultural wealth reaches its audience. All my work relates to what I learned in my information architecture course.
- IA and UX are not an exact science; they very much depend on the human context, a context that is ever evolving. Our role as IA and UX professionals is to bring knowledge of how humans understand and interact with information – and apply that knowledge to the evolving context of ever-changing technology. Technology will change, but human needs to understand information won’t.
I recently attended a happy hour gathering organized by a former student. She invited all the attendees from our Fall 2012 class to meet for a chance to catch up and share stories. I handed each student a button (Figure 1) that shows fingers connected in a triangle. In class, we used the triangle as a focusing strategy. The corners encouraged us to consider who our audience is, what they want and how they (and you) measure success. The triangle helped us think about content we would put in a communication product and content we would leave out.

After accepting the button, one former student placed it on her lapel saying, “This sticks….This definitely sticks.”

FIGURE 1.
Strategic Action: Information Architecture in Platform Migrations
by John R. Heffernan

EDITOR’S SUMMARY
Information architects (IAs) have a strategic role to play, especially in firms that appreciate the need for clear and efficient user experiences. To support the end user, information must have value and be organized and understandable. An information domain model is a useful starting point to set the parameters of an organization’s collection of online information resources. It provides a shared basis for stakeholders to analyze and discuss the domain, working toward a common and well-developed mental model and foundation for information architecture work. For the IA, it becomes the basis for sorting and mapping pieces of information during a platform migration or other transition. The IA’s focus is on deep understanding of content to define and strategically manage knowledge units. Developing and implementing an information domain model supports the goal of enhancing the user’s experience through content structure and findability.

KEYWORDS
information architecture
migration
content management
domain analysis
information models
information mapping
strategic planning

Real world information architecture happens when enterprises need strategic solutions to business problems and when executives understand that their business lacks the technology maturity needed to remain competitive.

What is technological maturity? Technologically mature firms innovate based on network services and Internet technologies in computing and data strategies. These strategic choices cut infrastructure costs and increase data storage flexibility through script-managed transaction and data models.

It is within these competitive firms that the information architect (IA) has an increasingly strategic role to play. While creating clear and efficient user experiences that enhance an organization’s web presence and the findability of its information, the IA also considers web assets in the context of the information value they represent and how the organization’s information can be structured more efficiently, increasing reuse, simplifying business processes and laying a foundation for future change.

In working with clients in different stages of platform migration, I have found that the need to simplify the complexity of information environments, information exchanges and use cases is of paramount importance. Creating an information domain model for an organization has proved a highly effective way to define and communicate about the organization’s information world. This approach is based on the software application development methodology advocated by Eric Evans in his book Domain-Driven Design: Tackling Complexity in the Heart of Software (Addison-Wesley, 2004).

Evans’ book serves as a good place to start. Although it’s almost a decade old, the book can support many of us working with complexity. It presents a systematic approach to domain-driven design, while incorporating design best practices and experience-based techniques. However it also
offers fundamental principles that facilitate the development of software projects facing complex domains. As a reader, you will learn how to use a domain model and you will encounter patterns and language to make a complex development effort more focused and dynamic.

I've used the model with mixed success. While some clients have immediately seen the value of this approach, others have not. I learned to explain the model and introduce it to clients as early as possible in the development process. The value of the domain model rests in its simplicity as a heuristic tool and usefulness in discovering other information requirements. For the design team, the model provides a common orientation to the project as it starts to take shape. It creates a framework for discussing the project.

Why do I recommend this model to IAs? With information architecture projects, my experience is that the ability of the stakeholders to visualize and describe future states and possibilities can vary significantly. I have found that the quality of information one can obtain from stakeholder/subject-matter expert interviews is improved by having a domain model to discuss. Subject-matter experts will reveal weaknesses in the model and thus supply new use cases, while major stakeholders can relate the model to their strategic vision for the organization. In both cases, one can put into perspective more easily exactly what is important and what is not, contributing to the development of a well-founded mental model for the functional design work.

From the IA’s perspective, however, the real value of the domain model is as a tool for parsing and mapping information chunks from existing states to future states. Just as with data migration, where decisions about where data currently stored in one system are going to live (or not) in a new system, information platform migrations require mapping existing information into a new structure.

Platform migration is a strategic opportunity to provide for future technology maturity, regardless of the organization’s readiness to move in that direction. My experience is that the structure and availability of information in current repositories is insufficiently rich, inflexible or both. For example, how suitable or how well do product information systems support marketing functions? How “available” are systems to flow information into site templates and e-commerce interfaces? Are the textual information units sufficiently minimalist to support reuse, translation workflows and or multi-audience strategies?

In other words, how well aligned are the metadata and content structures for a N-dimensional site development effort? While site developers and designers focus on how the user experiences information, the IA needs to remember that in the end, the users experience content and therefore need to focus on the visual structure of the content being supplied along with its findability.

From an enterprise perspective, successfully envisioned and implemented information architecture results in business efficiencies that deliver return on investment in the information components. In effect, the IA is being asked to knit together the enterprise information platform and the enterprise content strategy so that the right information is being delivered to the right people at the right time with maximum consistency and minimum redundancy of effort in either the production of source information or the design team.

How do we approach this challenge? We must help organizations separate content and form, focusing on defining knowledge units. To do that task, existing content must be understood at a deep level that, as with separating HTML from CSS or XML from XSLT, allows the information architect to describe what the information actually is.

We must also work to optimize knowledge around the principles of minimalism, findability and interoperability. While mental models and persona tell the IA (and stakeholders) what knowledge units are needed when and where, the more strategic issue (and one that needs to be addressed) is how those knowledge units are stored and managed. This strategic understanding is important because content management systems are databases, and there is an increasing divergence between the worlds of the data manager and the information content manager.

I encourage you to learn more about developing an information domain model. Consider this activity as one more step in helping your organization leverage its assets, move away from costly relational database repositories and move to a new level of information maturity.
Migrations: Not Just for Developers Any More
by Paula Land

Content migrations are hard. They’re complicated, expensive, detail-intensive and can take a long time. To appropriate a well-used metaphor, a migration is like moving all your possessions from one house to another. If the proper planning isn’t done up front, you can end up with a jumble of broken, misplaced stuff at the other end. Taking the time up front to analyze and plan and involving a multidisciplinary team in the effort pays off in the long run, helping the migration go smoothly and achieving an end result that satisfies both the business owners and the site users.

It Takes a Team

Site migrations are often staffed as IT projects. After all, there are software programs to be installed and configured, databases to be mined, scripts to be written, templates to be developed and data moved from one system to another. These tasks are all critical, to be sure, but if done without analysis of the content, architecture and functionality of the site – both the current version and the new – they lack the necessary context.

The ideal makeup of a migration team includes the developers, of course, and a project manager to keep it all organized and running smoothly. A business analyst helps create the technical requirements and specs that the development team will build from. But just as important are the information architect (IA) and the content strategist (CS), who carry the mantle for user experience and form a valuable bridge between the business owners and the end users.

Taking Stock

Before anyone starts planning how and where to move the site, and ideally before the new content management system or platform is selected,
the IA and the CS should inventory and audit the current site. The goal of the inventory is to understand in detail what content exists, what type it is, how it’s structured and why, what characteristics it has (is there metadata? are there naming conventions for assets?) as well as what functionality exists (forms, feeds, interactive elements like reviews and comments, transactional elements like registration or purchase) so that the new site can support all those current needs (we’ll get to future needs later).

Although many migrations are done as part of a larger redesign effort, it is seldom the case that every bit of content and every functional or design element of a site is replaced – and organizations rarely have the budget or organizational appetite to throw away everything and start fresh. Thus, it’s important to assess what is and isn’t working and what can be salvaged from the current site, perhaps polished up a bit, maybe moved to a different place in the overall architecture, but retained. Removal of what isn’t working and can’t be salvaged helps ensure that the new site is of uniformly high quality. Audits also create the opportunity to do a gap analysis, which assesses that current state against the desired future state and finds what’s missing and needs to be created.

While the initial inventory is an essentially quantitative exercise, the audit moves into the qualitative analysis. The CS will assess how much of the content is still current and relevant, how well it represents the organization’s brand and messaging goals, how well it supports user tasks and, in some cases, how it stacks up to competitors’ content.

The outcome of the content audit is a strategy for how content will be structured and managed going forward: what content will be migrated as-is, what needs to be revised and what should be removed; what content needs to be created to meet the new site goals and who will create it; and a set of content requirements for the new system to support. This latter category might include a content model that allows for content to be structured and tagged in a way that allows it to be reused and published in multiple contexts on multiple devices.

As the CS is auditing the content quality and developing content requirements, the IA can, in parallel, be auditing the site structure, taxonomy and navigation models and be determining how well the functional elements work.

Both the CS and the IA may also be looking at site metrics and analytics data to learn how users are interacting with content and functionality to see what’s working and what’s not, where users are dropping off or hitting dead ends.

Conducting stakeholder interviews with content owners and authors is important at this phase of the project too. These interviews should garner insights into content ownership, publishing processes, lifecycle management and governance as well as elicit the pain points that need to be addressed in designing the future state.

**Building for the Future**

The above activities often referred to as a discovery phase, provide a solid basis from which the team can begin to plan and scope the project. The business analyst can begin to document requirements, the technical team can estimate the migration effort, and the project manager can track migration and design tasks against the budget and schedule.

Setting up the new content management system offers several opportunities for the IA and CS to provide input and ensure that what gets set up supports the other important user group, the actual content authors and publishers.

Taxonomy is usually mentioned in a web project in the context of the overall site hierarchy and the structure of the terms with which content is tagged to support management, dynamic content generation and search. Unless an organization is fortunate enough to be able to have a dedicated taxonomist, a CS or IA generally manages this task. The taxonomy is instantiated in several ways in the content management system. The first is in the actual content tree or structure within which content is stored, which has implications for URL structure and, downstream, search engine optimization. The second is in the tagging management itself – the hierarchy of attributes and the vocabularies of their values. Building out that structure and creating the lists of terms as well as defining rules for governing and applying the tags is an important step in the design process and one that, if not done carefully up front, can be painful and difficult to fix later. The third way that taxonomy and metadata are built into a content management
system is in the authoring templates. Depending on the organization’s workflow, authors may be creating keywords and descriptions in the content input templates and applying tags from the taxonomy. All of this structure needs to be defined and requirements provided to the technical team for optimal implementation.

Templates, both the front-end presentation versions and the back-end content input versions, are another area in which content strategists and information architects play a key role. They are the experts in critical information such as

- different content types,
- requirements for breaking content down into its components,
- number of templates that need to be created and what they need to look like and do,
- metadata needs to be present and
- presentation of digital assets like images and video.

The IA creates the wireframes for the presentation templates, based on the content requirements provided by the CS and those that support the necessary user flows and interactive elements. Development of the content input templates likewise needs to be informed by the content and user experience strategies. Most modern content management systems support modularization – content and other assets stored and managed at a granular level that enables published pages to be assembled from components that are tagged for reuse. Decisions about the appropriate level of granularity and the triggers that cause the pieces to be assembled and presented (and how that differs on different devices) are the realm of the CS and the IA – and most developers will be more than happy not to take responsibility for design at that level.

In addition to the content management system design work, at this stage the IA is also designing new or improved navigation and user flows, creating the overall structure of the site. The CS is managing the actual processing of the content – creation, revision and tracking through from the old system to the new, making sure that the right content is moved and that it is placed correctly in the new system.

Workflows and governance round out the migration-planning picture. With the understanding of how content is created within the organization, how often it is updated or replaced and what level of review and approval is required, the CS can design authoring workflows and write governance guidelines. The IA, likewise, can stipulate a review and approval process for changes to the site structure, taxonomy and template design.

### Conclusion

Content migrations are generally undertaken with the goal of creating a more capable, robust system that supports current needs and can scale to handle future growth. They provide the opportunity to clean out the old and non-useful and to retain the best of what exists and put it all into a shiny new context. Ideally, they are done when necessary to support business needs, but as seldom as possible. Making the right decisions at the start and calling on the collective talents of the whole team, including the IA and the CS, helps ensure a successful migration and an efficient, user-oriented, easily managed website.
Data Curators at Work: Focus on Projects and Experiences
by Inna Kouper, Katherine Akers and Matthew Lavin

The Council on Library and Information Resources/Digital Library Federation (CLIR/DLF) postdoctoral fellowships in academic libraries and data curation encourage the development of digital curation as a hybrid profession by hosting fellows with a variety of disciplinary backgrounds, roles and responsibilities. As the authors of the grant proposal that partially supported the new CLIR/DLF fellowships explained:

“Facing … a shortage of experienced data scientists and curators with digital preservation experience, disciplinary specialists must begin to accept responsibility for helping in this vital scholarly work. One digital curation specialist cannot possibly manage the full and complex range of … responsibilities. Instead, teams of … curators with a variety of sub-specialist knowledge, talents and perspectives, working together with a shared understanding of the need for active … curation, will be required to enable future scholarship in all disciplines.”

Here, we expand upon the concept of professional hybridity by describing our projects and experiences as CLIR postdoctoral fellows and by reflecting on how the variety of roles that we inhabit influence digital curation.

Katherine Akers: Coming to the library from a neuroscience background, I embrace the “scholar-librarian” mindset while being service-oriented in my work. Through my engagement in a myriad of library projects, including helping to develop research data management services and assessing the use of library resources, I am gradually building a framework for understanding academic librarianship. In particular, I am increasingly struck by how my library projects—seemingly disparate at first—are beginning to inform each other. For instance, when interviewing faculty about their research data management practices, my default is to encourage researchers to preserve and share their datasets (all of them!) because it is difficult to predict their potential value. But when analyzing the usage of library databases, journals and books, I sometimes question the value of collecting resources without knowing whether they are subsequently used. I’m realizing that in both cases, knowledge of how existing resources are used should inform future preservation or collection decisions. The links between conducting research and supporting research, as well as the connections beginning to emerge among my separate library projects, add a whole new dimension to my understanding of how scholarly information is created and disseminated.

Inna Kouper: For me, data curation primarily concerns two things – cyberinfrastructure and user engagement.
am primarily involved with the NSF-funded Sustainable Environment, Actionable Data (SEAD) project (http://sead-data.net) that aims to create infrastructure to support data curation and management workflows in sustainability science. As a team, we face many architectural and policy decisions daily. How do we support ingest and discovery of heterogeneous datasets? What kind of interface can serve the dual needs of researchers and data managers? I see my role as a curator with social science and information science expertise in making sure that our decisions are well-grounded and that we maintain a balance between availability of resources and user needs. In parallel with building cyberinfrastructure, data curators need to ensure that cyberinfrastructure will be used. Much is being said about how data sharing and preservation leads to more reliable knowledge and improves citations. Recent discussions, including that of Reinhart and Rogoff’s “Growth in a Time of Debt,” demonstrate that data provenance and availability are crucial for the validity, reproducibility and trustworthiness of scientific results. This importance is why my other role is to articulate and disseminate norms and values of data sharing and preservation and to find “data champions” to engage researchers in data exchanges.

**Matthew Lavin:** I am working with other humanists to adapt digital tools and approaches to their disciplines. I’ve spent the year learning about digital scholarship, advancing my technical skills and working on expanding the archive titled “Death Comes for the Archbishop: A Digital History of the Book,” which creates an interface to visualize and analyze multiple copies of Willa Cather’s book *Death Comes for the Archbishop*, including inscribed copies, translations, notable editions and issues, and manuscripts. My project takes a bibliographical and book historical approach to digital humanities by (1) establishing a nuanced data model for bibliographical information, (2) facilitating visualizations of physical book features over time and (3) linking the data structure to high-resolution page scans. Although some scholars may not see this project as being related to data curation, I am approaching the study of book history through its most concrete data – the measurable properties of physical objects. Bibliographers have fastidiously recorded information about books in analog form for hundreds of years, but less has been done to consolidate, share and analyze these data in digital form. Humanists can collectively contribute to data curation when they begin to think about how to articulate data-driven questions, how to create or adapt shareable data and how to leverage this data with renewed rigor.

As these sketches illustrate, digital/data curators take on a variety of responsibilities, including surveying faculty about data management practices, analyzing library data, and building and adapting tools. Moreover, the definition of data differs among curators – from data created in different research domains to information on academic behavior, library collections, services and facilities, and the physical properties of books. Being a hybrid data curator means being open to and flexible about what to curate while maintaining scientific rigor during the curation process. One of the most remarkable aspects of our work is that it makes us open to serendipitous discoveries via the intentional expansion of knowledge bases, cross-fertilization among projects, connections between previous research and current practices, and conceptual thinking about data-research-knowledge ecosystems. Our experiences, over time, are helping to inform CLIR about the roles that subject specialists can play in data management of research data, how postdoctoral expertise complements the work of other academic professionals and the types of training that might benefit students preparing for careers in digital curation.