Perpetual Beta

Assessing the Institutional Repository

Allison Sivak and Leah Vanderjagt

The institutional repository (IR) is more than an end product that holds content. It is a complex system with a variety of participants and a development course that can most accurately be described as "perpetual beta." As a software system with both commercial and open-source iterations, an institutional repository undergoes continuous change in functionality and development. Predictions in the early 2000s were that the IR would stimulate a radical change in scholarly publishing. That initial formative vision has not yet been fully realized. The literature on institutionally focused IRs, as opposed to discipline-focused repositories, is starting to recognize that the reductionist lenses through which librarians view the institutional repository are too limited for the systems that have been built and the support required from academia.

Although librarians may promote IRs as the solution to the crisis in scholarly publishing, other areas of academia have different objectives for the IR and do not necessarily share that restrictive view. This chapter reviews some of the major assessment options librarians have for measuring the value and success of the institutional repository.

How Librarians Assess IRs

> While institutional repositories centralize, preserve, and make accessible an institution's intellectual capital, at the same time they will form part of a global system of distributed, interoperable repositories that provides the foundation for a new, disaggregated model of scholarly publishing."[1]

In this statement, Crow describes the way many librarians envision the role of institutional repositories and their potential impact on scholarly publishing. Bolstered by years of discussion and angst about the scholarly publishing crisis, quite a few librarians believe open access (OA) facilitated by institutional repositories offers a solution to that crisis. However, determining whether OA can serve as a viable solution for the scholarly communication crisis necessitates an understanding of assessment and evaluation criteria for repositories.

A search of *Library and Information Studies Abstracts* (*LISA*) using the terms "institutional repositories" and "assessment or evaluation" identified 83 articles. A subsequent search of Bailey's *Scholarly Electronic Publishing Bibliography* revealed a number of additional references.[2] After careful review, 34 articles dealing strictly with the assessment of institutional repositories were identified and reviewed, confirming that libraries use a variety of methods, approaches, and indicators to create descriptions and assessments of IRs and, by extension, to establish benchmarks to evaluate their success. Bjork and others, Bonilla-Calero, Gray, and Zuber discuss the assessment of disciplinary literature or objects, including the:

- proportion of content that is deposited under open access,
- rate of deposit,
- disciplinary profile, and
- authorship/collaboration indices.[3]

Information on contributors or potential contributors, on faculty attitudes towards open access, on self-archiving practices and rates, and on user needs assessments are reported by Xia and Lercher.[4] Kim and Kim evaluate the functionality or usability of an IR including the interface, search function and end-user statistics, while download statistics and speed of citation after publication have been studied by Gedye and Joint.[5]

A number of studies proposed using a single indicator such as object count in the IR, use of individual articles, time from publication to citation, sustained engagement with the system over time, and other activity-based measures.[6] However, the study by Kim and Kim contends that focusing on the system as a whole rather than on individual measures presents a more accurate method of determining key relationships and influential factors within the context of the IR and is therefore a more useful lens through which to consider IR assessment.[7]

This range of approaches suggests that, as Smith stated, "there is no consensus on what institutional repositories are for," but the literature indicates that a wide variety of assessment options and a range of approaches and indicators are available.[8]

Foundational Questions

To determine the success of the institutional repository, the fundamental question of the purpose of assessment must be raised. Nardini defined assessment as "a critical tool for understanding library customers and offering services, spaces, collections, and tools that best meet their needs."[9] This definition portrays library users as the most important stakeholders in the development of library services and collections. It posits assessment as exploratory in terms of learning about users' needs as well as offering support for decision-making with regard to resource allocation, whether those resources are staff-related or financial in nature.

Most assessment projects begin with a simple question, "What information is needed in order to make a decision about a specific issue or to resolve a particular problem?" If this question is asked about a newly launched institutional repository, most likely it would provoke the response that data is needed to substantiate the value of the repository.

If user needs are central to the decision-making process, it would be reasonable to assume that libraries routinely conduct a needs assessment before implementing an IR. However, Yakel and others found in their survey of college and research libraries that assessments of user needs did not constitute a major factor in the decision to initiate an institutional repository.[10] Instead it seems that libraries initiate repositories primarily in response to the actions taken by their peer institutions. If this assertion is accurate, then it is necessary to be familiar with the original vision and goals regarding IRs.

This idea is echoed by Choudhury, who states, "in a fundamental sense, it will be important to return to the first principles that prompted interest in the IR movement, rather than focus on the current practices that have defined the IR movement to date."[11] Without examining the prevalent ideas that guided IR services development, it is difficult to understand how the success markers were established or to look critically at assessment work that has been done. By reviewing themes from articles about institutional repository assessment, it should be possible to identify indicators for measuring success and to determine whether the goals for IRs have been realized.

The State of Institutional Repository Assessment

Quantitative measures about IR contents or participants create simple profiles of IRs rather than evaluate their success. Using quantifiable measures is appealing for several reasons. It is easier to obtain quantifiable data than to prepare qualitative comments. Collecting numbers is straightforward—the numbers speak for themselves. Although numbers can be manipulated to support (or not) a particular point of view, they do not require judgment. For decades librarians have been tracking and reporting quantifiable information to organizations such as the Association of Research Libraries (ARL), so they are familiar with this activity. However, using quantitative statistics as the key means to assess the institutional repository is not immediately useful. Although easily comprehensible to readers and to administrators, statistics have a tendency to reduce evaluation to a few numbers such as the quantity of objects in the repository, the rate of participation across the repository's user group, or the frequency of access or number of downloads an object has received. These measures of success are broad summaries and may not reflect the goals of the IR. For example, is there any evidence available that item count rankings indicate user satisfaction with IRs?

In their work on creating a model of relationships between features of an IR, Kim and Kim underscore the importance of understanding how one particular aspect of the institutional repository may influence other aspects. Through a rigorous process that involved several tests of relevance, the authors identified categories and items of evaluation from digital library literature. Using the Delphi Method, these categories were ranked according to their importance and a group consensus was reached. After considerable analysis, Kim and Kim consolidated 39 indicators into 12 factors, which they arranged under four broad categories.[12] See table 1.

The authors note that "relations among evaluation indicators have as much importance as the simple listing of indicators."[13] After performing both a factor score correlation and a regression analysis of the factors within categories, the Use category is cited as the most crucial of the performance criteria, although Resource Allocation (budgeting and IR staffing) indirectly influences Use as well. Furthermore, librarians participating in the Delphi Survey data collection did not rate budgeting and recruiting IR staffing highly, even though these two factors are shown by analysis to influence Use. Kim and Kim conclude their work by noting that evaluation indicators of IRs are more successful when they include procedural and performance assessment in addition to input and output measures such as the content loaded into the IR and the content accessed from the IR.

Kim and Kim's work introduces a major shift in the way IR assessment is viewed and produces a replicable and suitably complex method for evaluating repositories. Their emphasis on procedural assessment acknowledges that the

Table 1 Evaluation Framework

Category	Factors	Variables
Content	Quality Diversity Currency	no. of university publication articles no. of document types no. of other articles metadata consistency no. of documents published in the last 3 years accuracy of the table of contents no. of theses no. of required metadata elements no. of metadata elements completeness of full text metadata completeness
Management and Policy	Commitment Regulation Resource Allocation Archiving	no. of archiving methods IR librarians librarian attendance at seminars IR budget library director's awareness on Open Access no. of PR/marketing methods mandatory submission of digital versions of theses no. of formal agreements IR management policies policies for content preservation existence of a university committee on IR
System and Network	System Performance Multifunctionality	retrieval speed success rate of accessing its full text linkage of main library homepage to dCollection existence of FAQ services IR documents retrievable through OPAC integrated search of OPAC and dCollection systems response rate to Q&A services
Use, User, and Submitter	Use Rate User Support	no. of downloaded documents no. of available services for submitters no. of IR user training methods no. of IR user training lessons no. of IR submitter training methods no. of IR submitter training lessons

institutional repository is not a fixed product, but a mutable system of knowledge distribution that involves many individuals within the scholarly communication community, including those within libraries who work to support IR development and deployment. The IR's success requires not only an institutional commitment to make the necessary resources available but also hinges on participation from scholars and professionals in the academy, as the submitters and users of content.

Smith's comment on lack of consensus about the purpose of the IR compared with Crow's statement about the centrality of the IR to the system of scholarly publishing raises the question: why are those two visions so contradictory? Overall it seems that Crow's vision represents an argument of technological determinism, meaning that the establishment of IRs would naturally drive economic, cultural, and social change as well as scholarly social practice within academia. However, this argument is as yet unsupported by the IR assessment literature.

One explanation for this shift could be related to the paucity of user needs assessment studies. At a time when libraries are being asked to justify the need for special services and to demonstrate the sustainability of those services, the IR movement appears to be shifting its original cohesive vision and direction. Library administrators and IR managers must redefine Crow's original objectives and more clearly relate them to the goals of the institution. One way this might be done is for university leaders to endorse the IR as a tool to promote innovation and strengthen research programs.

Tacit Knowledge

Another approach to understanding repository success is by using what is called tacit knowledge.[14] In many scholarly disciplines, particularly in evidence-based medicine, case studies are an established and expected form of publishing and help sustain a vigorous research agenda. In the context of the institutional repository, it could be expected that case studies would be of substantial value. Yet studies of this nature may be subject to criticism in terms of transferability because they appear to lack any broadly meaningful conclusion.

Gathering tacit knowledge can occur via underground networks of support and information-sharing at conferences, over discussion lists, or through other communication mechanisms. It may also be related to a gut feeling about the IR and the informal and innate ways in which conclusions about the IR's success are reached.

Tacit knowledge plays a significant role in evaluating the IR and incorporating an element of tacit knowledge into program evaluation and assessment planning is one way that assessment for IRs can be fully articulated, formalized, and incorporated into a more complex systems model of evaluation. Using the method outlined by Kim and Kim—reviewing the literature, gathering perceptions of IR managers and library administrators, and using statistical analysis to validate indicators and test the relationships between those indicators—it is possible to integrate tacit knowledge into assessment plans and models for IRs.

The use of tacit knowledge should be balanced against early, formative visions of the purpose, role, and operation of the IR. Although the global system of IRs has not yet transformed scholarly communication, this does not mean that IRs have failed in their purpose. The complexity of an IR program challenges librarians to respond to a formative vision that differs from current experience. Key unanswered questions that could inform this vision include what IR users want and need from these systems, such as collaborative online workspaces, citation management and reporting functions, and content policies that permit acceptance of nonscholarly content, such as administrative minutes.[15]

The Path to Assessment

It is interesting to note that features users desire and are beginning to expect in an IR, such as collaborative workspaces, are still considered as value added aspects rather than part of the IR's standard functionality. If users perceive one function or feature as central to the IR while program administrators continue to insist it is adjunctive, that would seem to create a system that serves the needs of librarians but fails to satisfy the needs of faculty or students.

Another dichotomy within the IR movement exists around the issue of self-deposit. Why do librarians still attempt to convince faculty of the value of self-deposit in the face of repeated studies that have confirmed that self-deposit is ineffective and does not advance service development?[16]

The question is not whether open access is an appropriate and worthy cause, but whether an OA campaign appears to be a contributing factor to IR success and faculty uptake.[17] Advancing the OA movement might require either a different vehicle or a repositioning of advocacy within the economic systems of academic libraries. Research still needs to be done on why this ethic does not translate into action, but that does not mean that the global IR movement should surrender its pursuit of an answer to the call of the original scholarly publishing-related vision for IRs. However, it may mean that open access is not obviously and directly relevant to IR assessment, and continuing to focus on it to the exclusion of other factors that may promote IR success only serves to divert attention from Crow's vision.

It would seem more appropriate to ask users what they need so that they will begin to incorporate IRs routinely into their work. This could happen if IR managers could focus their efforts on interoperability and meta-repository search applications as well as policy alignment with similar repositories and deeply consider how well they collate, distribute, and act to preserve deposits. Assessment of certain elements of IR operations, such as author rights, would be more productive if those rights were tightly aligned with the needs of users who then become sufficiently irritated by rights barriers and thus demand that authors be informed about their options for retaining their rights.

The open access outreach movement is largely communications-based and open access problems are presented on conceptual grounds. Therefore, it is not surprising that open access outreach has not resulted in faculty self-deposit. If author rights are the exclusive focus of IR training and operations, assessment will be restricted to accepting the concept of open access rather than examining other variables for measuring IR success.

Designing a path of assessment for an IR may be an even murkier endeavor than understanding the purpose of the IR. To design a path to assessment, two important realities about assessment and how they relate to IR assessment planning must be recognized. First, assessment is not a clearly objective activity. It is informed and shaped by the research questions being asked. Second, assessment is not a value-neutral activity. By prioritizing the questions, it may be anticipated that some kind of proof of value or need for improvement will be obtained. It is interesting to note that library assessment in general emphasizes the importance of the users' perceptions in understanding the effectiveness or value of a service, yet within IRs, the users seem to have been left out of the assessment equation altogether. Is that because librarians are holding too tightly to a formative vision dedicated to radically changing the system of publishing rather than seeing IRs as software and systems that users can employ in ways that oppose that vision?

Assessment reviews an original goal and validates the success of a program against that goal. Within the IR movement, most users no longer accept the initial formative vision of the IR and have identified different goals and a different vision for the IR. Therefore, when designing an assessment tool it is important to understand users' ideas and either map their personal or organizational agendas to the original formative vision or revise the vision so that it is more relevant and thus more powerful. It is also important to integrate user evaluation into assessment plans by asking whether the IR serves user-defined needs without any form of prescriptive context for the question.

Meaningful evaluation to help build understanding or refine direction depends on the questions being asked and the individual doing the asking. For example, an administrator may place value on how well the system captures and delivers information for annual reports or research overviews of departments or faculties, whereas an IR manager might be more interested in knowing the extent to which the items in the IR are indexed in major search engines. Or a user may want to know how many downloads his paper has received and whether or not he is being cited more frequently as a result of having his work more readily accessible through the IR.

Creating the Assessment

The user's question still speaks to the formative vision of the IR and is based on a limited understanding of the IR's potential. Foster and others have reported that contributors to IRs typically see the IR as serving the personal needs of an individual rather than the altruistic ones articulated by the IR movement's formative vision.[18] Yet in terms of assessment, understanding downloads and citation patterns can still be perceived as meaningful points of investigation.

Nevertheless, the formative vision of the IR should not dictate all the assessment questions. When assessment paths begin to diverge aggressively away from the global formative vision for IRs, the task of evaluating the IR becomes more difficult. It is critical to consider who is asking the questions and the importance of their stake in the IR project. Naturally IR managers will be asked questions by those to whom they report and by those served by the IR. However, if those questions are truly divergent from the original formative vision, two things become apparent:

- Assessment results must include definitions of success indicators and why those indicators were chosen. Further, the limitations of the methods and measures must be outlined, stating what they *do* measure, as well as what they *do not* measure.
- If the formative vision is to be incorporated into evaluations (for example, prestige of institutions via IR ranking attempts), that vision is likely to require review and re-articulation.

Another impetus behind assessment planning is the need to determine the reason for the inquiry. Are there issues related to organizational reputation, operational effectiveness, scholarly contribution, faculty perceptions of use, or professional value advancement that should be considered? Repository managers may wish to ask such typical assessment questions as:

- Are we responsible stewards of the scholarship with which we have been entrusted?
- Does this IR offer valuable services to faculty and to the global research community?
- Is the funding model for the IR sustainable and justifiable?
- Where does the repository rank in terms of comparable IR projects?

As currently envisioned, assessment of IRs does not provide a single, clear measure of success, and there does not seem to be any consensus regarding standard indicators for measuring a successful IR implementation. The diversity of approaches revealed through the literature search makes it clear that no single measure or investigative technique can be used to declare definitively that an IR is successful. That is why the approach outlined by Kim and Kim—assessing variables that reflect the realities of the complexity of the IR and the IR's formative vision—provides a step in the right direction.

In assessment planning it is important to recognize that there is much about the IR and its relationship to the formative vision that is not yet understood. However, it is reassuring that, over time, appropriate and meaningful measures that address both the formative vision and local objectives can be defined. The place of the library web site in the academic library service environment serves as a good example. The library web site as the portal to resources supporting learning and research serves specific needs of a user population and asserts the formative vision of that web site as the authoritative gateway to critical resources supporting the aims of scholars. Setting aside the question of needs assessment, multifaceted or complex assessment prior to implementation or during the initial stages of implementation is not essential.

In fact, other interesting techniques can be applied at various stages in the life of the IR which may provide useful answers and further the institutional agenda. For example, one could create and schedule assessment plans that address sustained engagement in IR participation as Les Carr and others propose, but sustained engagement is not an applicable measurement for a recently launched repository.[19] A powerful measurement, especially prior to launch or in the IR's early days, is a study of user experiences with the IR's interface design to gauge how well that interface supports the primary goals of deposit, search, and retrieval. Another early indicator that could provide useful assessment data relates to resource allocation, such as the number of programming hours required for system customization.

System Performance

System performance is another element that should be considered when designing a formal assessment plan. Can perceptions of system performance, whether satisfactory or not, be supported by detailed metrics? Measuring system performance, particularly in the early days of implementation, is very important because perceptions of poor performance or slow application may cause user frustration, which would be problematic for both reputational and functional reasons.

If IR assessments begin to incorporate tacit forms of knowledge into complex systems analysis, and if the goal of local assessment can be mapped to original formative visions so that these can be deeply evaluated, there are several other necessary matters at hand that would demand broad acknowledgment.

Certain elements of assessment should be evaluated at points that are appropriate both to the age of the IR and to the age of the IR movement overall. Although many IRs have been in place for nearly a decade, many others have been launched only in the last two or three years or are still in the planning phases. Designing an assessment tool for these newcomers should include asking very basic questions such as the extent of search engine indexing, user understanding of the purpose of the IR, and user understanding of deposit processes and should not apply a complex system of evaluation to a brand-new program. At this stage of IR development, broad measures of IR activity not appropriate for a fledgling IR should be avoided as part of the assessment process. In determining the path of assessment for an IR, it should be possible to study the launch of any typical program, evaluate any new service, extract elements, and evaluate those elements at different stages in the life of the IR. A collective understanding of how well an IR is working depends on many factors—one of which is stage of launch. In fact, it should be obvious that stage of launch is a critical variable for contextualizing assessment particularly if rankings are to be established. If the global IR community could agree that certain points of inquiry are appropriate only in the context of a specific variable, such as age of the IR, then IRs that have been recently launched but are seeing early success will not be penalized with poor evaluations because their item counts are, as yet, relatively low. The international IR movement would also benefit from the assertion that shared item counts are more meaningful within the context of a mature repository.

As an assessment is planned, agreement must be reached on the proposed agenda and the timing for the assessment. The actual assessment requires agreements on standards of investigation, including the selection of the appropriate units of analysis, and those units may differ depending on the program being assessed. Beginning with mapping tacit knowledge, the assessment then moves to multicenter quantitative or mixed-method investigations and the replication of studies. In other words, there is an assessment journey for IR success. The journey begins with tacit knowledge and once the community of practice for IRs accepts an item of tacit knowledge broadly, it should be expected that paths of investigation will subsequently translate into other instruments of assessment that are ever-more powerful, rigorous, and evidentiary, such as the Kim and Kim multifactor assessment approach.

Conclusion

Based on a review of the IR assessment literature, a number of themes have been identified, including the elements to be measured, the purposes and limitations of assessment work, the specific variables to be used in measuring repositories, the integration of tacit knowledge, and the desirability of incorporating a variety of elements and relationships into IR assessment. Taken together, they form a complex, evolving environment for IR assessment planning.

The Kim and Kim model provides a method of mapping elements of tacit knowledge and clear variables that can indicate success or failure and enable a shift from a deeply subjective environment to one of commonly applied structural investigations.

Questions about assessment may relate to institutional politics, to funding challenges and resource allocation, and to rankings. The institutional repository is, at its most fundamental level, a collection of objects—and those objects can be counted. Therefore, the simple measure of "how many" will likely be the primary unit of comparison. However, by not asking more refined questions or endeavoring to design a more complex investigatory tool, IR managers risk becoming servants to the question of rankings, rather than contributing to assessment on a global scale.

If a thousand people are lined up at the IR door but the library is still sorting out ingest workflow, is this failure? It may simply be too early to begin asking questions related to volume and dissemination. After studying assessment techniques and evaluating the pros and cons of assessment in relation to the institutional repository, it may be prudent for IR managers to resist any sort of formal assessment until the IR is a more mature product or until there is an agreement that measuring item count is inappropriate for a new repository. In order to avoid undermining the goals that have been established, the most meaningful form of assessing a new IR is establishing measures appropriate to the age and complexity of the repository. While there are questions at that stage that cannot yet be asked, preparations can be made so that those questions can be asked when the time is right. There are many biases and limitations to existing investigations. Most importantly, it must be acknowledged that the IR movement, with its powerful formative vision, deserves to be assessed equally powerfully.

Reference Note

1. Raym Crow, *The Case for Institutional Repositories: A SPARC Position Paper* (Washington, D.C., SPARC, 2002), 6, http://works.bepress.com/cgi/viewcontent.cgi?article=1006&context=ir_research (accessed November 22, 2010).
2. Charles W. Bailey, *Scholarly Electronic Publishing Bibliography.* http://digitalscholarship.org/sepb/sepb.html (accessed November 26, 2010).
3. Bo-Christer Björk, Annikki Roos, and Mari Lauri, "Scientific Journal Publishing: Yearly Volume and Open Access Availability," *Information Research* 14 (March 2009), http://informationr.net/ir/14-1/paper391.html (accessed March 13, 2011); A. I. Bonilla-Calero, "Scientometric Analysis of a Sample of Physics-related Research Output Held in the Institutional Repository Strathprints (2000-2005)," *Library Review* 57, no. 9 (2008): 700–21; Andrew Gray, "Institutional Repositories for Creative and Applied Arts Research: The Kultur Project," *Ariadne* no. 60 (2009), www.ariadne.ac.uk/issue60/gray/ (accessed March 13, 2011); Peter A. Zuber, "A Study of Institutional Repository Holdings by Academic Discipline," *D-Lib Magazine* 14, no. 11/12 (Nov./Dec. 2008), www.dlib.org/dlib/november08/zuber/11zuber.html (accessed November 22, 2010).
4. Jingfeng Xia, "A Comparison of Subject and Institutional Repositories in Self-Archiving Practices," *Journal of Academic Librarianship* 34, no. 6 (2008): 489–95; Aaron Lercher, "A Survey of Attitudes about Digital Repositories among Faculty at Louisiana State University at Baton Rouge," *Journal of Academic Librarianship* 34, no. 5 (2008): 408–15.
5. HongYo Kim and Hyun Hee Kim, "Development and Validation of Evaluation Indicators for a Consortium of Institutional Repositories: A Case Study of dCollection," *Journal of the American Society for Information Science and Technology* 59, no. 8 (2008): 1282–94, http://onlinelibrary.wiley.com/doi/10.1002/asi.20818/abstract (accessed November 22, 2010); Richard Gedye, "Measuring the Usage of Individual Research Articles," *Serials* 22, no. 1 (2009): 24–27. http://uksg.metapress.com/media/agxy6yfbtj4xrgafqwtm/contributions/c/m/j/5/cmj554871731438q.pdf (accessed November 23 2010); Nicholas Joint, "Practical Digital Asset Management and the University Library," *Library Review* 58, no. 2 (2009): 89–96.
6. Bjork and others, "Scientific Journal Publishing;" Geyde, "Measuring the Usage of Individual Research Articles;" Joint, "Practical Digital Asset Management and the University Library;" Leslie Carr and Tim Brody, "Size Isn't Everything: Sustainable Repositories as Evidenced by Sustainable Deposit Profiles," *D-Lib Magazine* 13, no. 7/8, (July/August 2007), www.dlib.org/dlib/july07/

carr/07carr.html (accessed March 13, 2011); G. Sayeed Choudhury, "Case Study in Data Curation at Johns Hopkins University," *Library Trends* 57, no. 2 (2008): 211–20; Bonilla-Carrero, "Scientometric Analysis of a Sample of Physics-related Research Output."

7. Kim and Kim, "Development and Validation of Evaluation Indicators for a Consortium of Institutional Repositories."
8 Abby Smith, "Foreword," in *Census of Institutional Repositories in the United States MIRACLE Project Research Findings,* ed. by Karen Markey, Soo Young Rieh, Beth St. Jean, Jiyhun Kim, and Elizabeth Yakel (Washington, D.C.: Council on Library and Information Resources, 2007), ix, www.clir.org/pubs/reports/pub140/pub140.pdf (accessed July 10 2010).
9. Holly Grossetta Nardini, "Building a Culture of Assessment," *ARL Bimonthly Report* 218, 11 (2001), www.arl.org/bm~doc/assess.pdf (accessed November 23 2010).
10. Elizabeth Yakel, Soo Young Rieh, Beth St. Jean, Karen Markey, and Jihyun Kim, "Institutional Repositories and the Institutional Repository," *American Archivist* 71, no. 2 (2008): 323–49.
11. Choudhury, "Case Study in Data Curation at Johns Hopkins University."
12. "Delphi Method," http://en.wikipedia.org/wiki/Delphi_method (accessed March 13, 2011).
13. Kim and Kim, "Development and Validation of Evaluation Indicators for a Consortium of Institutional Repositories," 1293.
14. "tacit knowledge," http://en.wikipedia.org/wiki/Tacit_knowledge (accessed November 23, 2010).
15. Nancy F. Foster and Susan Gibbons, "Understanding Faculty to Improve Content Recruitment for Institutional Repositories," *D-Lib Magazine* 11, no. 1 (January 2005), www.dlib.org/dlib/january05/foster/01foster.html (accessed March 13, 2011); John S. Erickson, James Rutherford, and Desmond Elliott, "The Future of the Institutional Repository: Making It Personal," *General Session Submission for Open Repositories 2008,* Southampton, UK (1–4 April 2008), http://pubs.or08.ecs.soton.ac.uk/125/1/submission_19.pdf (accessed August 15, 2010).
16. Jingfeng Xia and Li Sun, "Assessment of Self-Archiving in Institutional Repositories: Depositorship and Full-Text Availability," *Serials Review* 33, no. 1 (2007): 14–21.
17. Philip M. Davis and Matthew J. L. Connolly, "Institutional Repositories: Evaluating the Reasons for Non-use of Cornell University's Installation of DSpace," *D-Lib Magazine* 13, no. 3/4 (March/April 2007). www.dlib.org/dlib/march07/davis/03davis.html (accessed March 13, 2011).
18. Foster and Gibbons "Understanding Faculty to Improve Content Recruitment for Institutional Repositories."
19. Carr and Brody, "Size Isn't Everything."

ISBN: 978-0-8389-8562-5