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R. M. Darby , C. M. Jones , L. D. Gilbert & S. C. Lambert

To cite this article: R. M. Darby , C. M. Jones , L. D. Gilbert & S. C. Lambert (2009) Increasing the Productivity of Interactions Between Subject and Institutional Repositories, New Review of Information Networking, 14:2, 117-135, DOI: [10.1080/13614570903359381](https://doi.org/10.1080/13614570903359381)

To link to this article: <https://doi.org/10.1080/13614570903359381>



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Published online: 30 Nov 2009.



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INCREASING THE PRODUCTIVITY OF INTERACTIONS BETWEEN SUBJECT AND INSTITUTIONAL REPOSITORIES

R. M. DARBY, C. M. JONES, L. D. GILBERT, and S. C. LAMBERT
e-Science Centre, Science and Technology Facilities Council, UK

The Subject and Institutional Repositories Interactions Study (SIRIS) was undertaken for JISC in 2008 with a brief to produce a set of practical recommendations to improve interactions between institutional and subject repositories in the UK in respect to scholarly articles. The study was based on interviews with stakeholders and a questionnaire distributed to institutional repository managers. The different types of repository and their functional requirements are defined. The authors consider the reasons repositories interact and the types of interaction they might engage in. The current situation in the UK repository system is described. Key findings that emerged from the study concern achievement of critical mass, collection priorities, metadata, identifiers and versions, and the issue of trust as it affects engagement on the part of community members. The authors develop a number of scenarios for possible evolutions in repository interactions in the near future, organized around four key drivers: population of repositories, statistics and metrics, preservation, and aggregation of research outputs. The study's final report addressed seven recommendations to various stakeholder groups within the repository community: JISC, research funders, repository managers, publishers, content creators, and software developers. These recommendations concern standardization, best practice, and community engagement and dialogue.

Keywords: *institutional repositories, Open Access, research outputs, interoperability*

Introduction

Why should repositories interact with each other? Because the information that repositories collect—research outputs and data about research outputs—is of value to multiple parties: to the institutions that employ researchers; to the organisations that fund research; to researchers as producers, interested to validate their

Address correspondence to C. M. Jones, Science and Technology Facilities Council, e-Science Centre, Building R61, Rutherford Appleton Laboratory, Harwell Science and Innovation campus, Didcot, Oxfordshire OX11 0QX. E-mail: Catherine.jones@stfc.ac.uk

work and build a research record; and to other researchers, who will consume the intellectual content produced by their peers. Repositories by definition exist within a network of relations with other repositories and information sources, because individual authors can have multiple institutional affiliations and content can have multiple authors from different institutions.

The existence and nature of interactive relationships between repositories was the concern of the Subject and Institutional Repositories Interactions Study (SIRIS), conducted in 2008 by the authors on behalf of JISC. Our brief was to produce a set of practical recommendations to improve interactions between institutional and subject repositories in the UK. While the study focused on scholarly articles within the UK repository field, many of the recommendations made in the report are capable of a general application to research outputs in the context of a global repositories' system. This article summarizes the findings and recommendations presented in the final report.

Definition of Interactions Used for SIRIS

When considering the actual or potential interactions between repositories, we must bear in mind the purpose or purposes that any one repository serves. These can be described under four headings:

- promotion of Open Access to full-text research outputs;
- dissemination and promotion of research;
- long-term preservation of research outputs; and
- administrative assessment and evaluation.

These are the imperatives of the bodies that pay for and operate the repositories—the *indirect* producers and consumers of research outputs. Individual researchers, the *direct* producers, and consumers of research outputs, have their own interests: as producers they want to disseminate their research within the peer community and develop their professional capital; as consumers they want to identify, locate, and access relevant content with maximum efficiency and minimum obstruction. Having regard to these institutional and individual motivations, this study identified seven categories of interaction, which may occur either

directly with other repositories or with third parties that perform some function in respect of the whole repository community (Table 1). Not all interaction need be content-related: for example, exchange of information about policies.

Study Methodology

Views were solicited from the repository community in order to explore prevailing beliefs, visions, positions, and practices. Three classes of stakeholders were identified as sources of information:

- funding bodies;
- managers of institutional and subject repositories; and
- a selection of individuals with influence and vision in the field.

Repository policies and practices were understood to have been formulated at least partly in response to the needs and practices of their academic users; and so, researchers were not directly consulted. The published statements of providers of third-party services and publishers were taken into account where they had a bearing on the study.

Interviews were conducted with 30 key stakeholders among funding organizations, repository managers, and field experts. In addition, an online survey was distributed to 125 repository administrators through the United Kingdom Council of Research Repositories (UKCoRR) mailing list and elicited a total of 32 responses—a response rate of approximately 25%.

Questioning was designed to elicit a picture of the current repository landscape in the UK and to establish information concerning the purposes for which repositories were designed and run; the degree to which stated objectives were being fulfilled; the methods by which content was collected in repositories; local policies regarding mandated deposit, metadata, version collection, and identification; actual and desired kinds and levels of interaction with other repositories; motivations and barriers to interaction—systemic, organizational, and cultural; and, practical steps that might be taken to enhance interactions.

Interview and survey results were analyzed with reference to the published literature on repositories, the published aims and views of stakeholder organizations, and projects of relevance to

TABLE 1 Categories of Repository Interaction

Interaction	Description	Possible partners in interaction
Metadata transfer: one or more records	Duplicating the content of an identifiable set of records from one repository to another for the purpose of increasing the content	Two repositories; publication databases and a repository; research management system and a repository
Metadata and full text transfer: one or more items	Duplicating the content of an identifiable set of items and records from one repository to another for the purpose of increasing the content and providing access to the full text or a specialized service such as preservation	Two repositories; repository and specialized third party service
Notification of content	A repository provides an alerting service so that others can collect content or point to content	Repository; repository and research management system
Statistics collection	A repository or third party service collates usage statistics on recognized full text items	Repository and third party service
Information exchange about policies	A third party service collects information about policies in order to provide additional services to repositories	Repository and third party service
Look-up or resolution services	A URI in another service is resolved to content held in the original repository	Third party service and repository
Linking to related information	A scholarly work links to related data or other material	Scholarly works repository and data repository

repository interactions. Using the findings, a number of repository interaction scenarios were developed in terms of drivers (primary motivators) and enablers (facilitating conditions or activities).

The Repository Field

The picture that emerged from this study was of a complex repository landscape featuring different types of repository at different stages of development, performing a variety of functions for diverse, sometimes overlapping communities in the academic sector. Because the repository system is still in the relatively early stages of evolution, there was a marked variety of views and practices in respect to almost all aspects of repository administration, including the principle purpose of a repository, collection policies, deposit mandates, and procedures, metadata requirements, version identification and control, and the exposing and harvesting of content.

Types of Repository

Three types of repository were identified by the study: the *institutional repository*, the *subject repository* and the *funder repository*. Each of these types can be defined in terms of their primary functional objectives.

The *institutional repository* is a collection of research outputs and/or associated metadata with a common link to a Higher Education Institution (HEI) or Research Council Institute, usually by authorship. Content is likely to cover a variety of research disciplines and to be produced with funding from several of the Research Councils and other funders. Institutions may or may not mandate deposit; content distribution tends to be uneven, often reflecting the engagement of early adopter groups within the institution. The purposes served by institutional repositories in order of importance as identified by the survey: 1) showcasing of the institution's intellectual output; 2) Open Access dissemination of research content; and 3) provision of administrative metrics and content preservation. The institutional repository field is the most prolific; it is also the least mature and arguably the least well-resourced. At the start of 2006 OpenDoar listed just

over 21 institutional article-collecting repositories; as of July 2009, it lists 87. This is a growth of 414% in the space of 42 months. The repositories managed by the survey respondents split into the following ages: 10% were more than 5 years old, 16% were between 3 and 5 years; 44% were between 1 and 3 years; and 30% less than a year old.

The *subject repository* is a collection of full-text research outputs with a common link to a particular subject discipline. It has contributors from many different institutions, based in many different countries, and supported by a wide variety of funders. The repository is likely to be funded by contributions from the subject community and administered by community members. Deposit of content is voluntary. The overriding purpose of these repositories is dissemination. Subject repositories thrive in highly integrated, well-defined communities with established collaborative working practices. The highly successful physics repository, arXiv, was founded in 1991 and emerged from the already established practice within this community of researchers circulating paper preprints among colleagues.

The *funder repository* is a collection of research outputs and associated data with a common link to one or more funders. Examples include ESRC Society Today and UK PubMed Central, which is supported by funders in the medical sciences sector. The funder's remit is usually broadly subject-based. Content is generally full-text Open Access or an embargoed published version. Contributing authors will come from many different institutions. Deposit of content is usually by funder mandate and systematically organized: UK PubMed Central obtains much of its content directly from publishers. Funders generally subscribe to the principle of Open Access and view the repository as an important marketing tool. Information collected in the repository is used to produce financial metrics and to inform strategic planning. For these reasons the funder repository is considered integral to the work of the funding organization(s).

Current State of Interactions Between Repositories

Although sharing of content and data between repositories is approved in principle by most stakeholders, in fact, there is very little interaction between repositories as identified in the interviews

and survey undertaken as part of SIRIS. While all of the institutional repository managers surveyed expressed an interest in interacting with other repositories, especially the well-established funder and subject repositories (UKPMC, RePEC, ESRC Society Today and arXiv being the most popular), fewer than 20% had actually collected content from any other repository, and only 30% said that content was harvested from their repository by others.

Achieving Critical Mass

Perhaps the single most significant depressant of interactions between repositories is the difficulty of getting viable content into the system. Repository managers struggle to persuade researchers of the value of depositing their works in repositories. According to the questionnaire respondents, about 25% of content in their institutional repositories is accounted for by direct author deposit; 46% enters through deposit mediated by repository and other staff, and about 18% by bulk transfer from other sources.

Metadata can vary enormously between repositories, both in quantity and quality. Repository managers are alert to the issue of quality, with 83% of the survey respondents performing post-deposit quality checks. An example of a funder repository that undertakes quality assurance is Society Today. Different stakeholders will have different data requirements, and may need to enhance metadata acquired from other repositories or may expose metadata for harvesting which contains information that is redundant or inadequate for the purposes of other repositories.

By and large, researchers are not easily persuaded to deposit their research outputs. Arguably the tide is beginning to turn, as repository content and visibility increases, with institutions promulgating archiving mandates, and researchers being required to establish their research record for the purposes of internal and national assessment. But the deposit process remains outside the core scholarly production workflow and is too often perceived by researchers as a merely bureaucratic exercise.

Factors Influencing Potential Interactions

Given the interest in interactions for achieving critical mass, the questionnaire asked about the factors which might influence

decisions to source content from another repository. Tables 2 and 3 show the results for technical, and policy and cultural issues.

For successful interactions to occur across the repository system, agreement on minimum metadata standards is desirable; this is implicit in the responses to the last question in Table 3. Metadata that lacks funding identifiers, clear institutional affiliation, explicit version identification, and licensing information, has limited value for repository interactions. Being able to establish with authority and consistency the identity of a person or corporate body attached to a research output is vital for any repository data exchange process, as demonstrated in the survey response. Although different stakeholders may need this information at different levels of detail, the current difficulty of identifying authors and related institutions is a serious inhibitor to effective interaction between repositories. Trust in the repository providing the information is important and reflects the fact that most repositories provide a showcase facility for the institution and quality must be maintained within resourcing constraints.

Descriptive metadata such as subject classification and version declaration added to the basic set required for crude identification makes repository content more discoverable and usable. But there is a practical balance to be achieved between richness and usability. The tendency will always be to the functional minimum, especially if repositories mature to the level where high volumes of ingest material are regularly processed. There is a probability that, as in the case of the cataloguing in the MARC bibliographic format, the richness of more sophisticated metadata specifications, such as the Scholarly Work Application Profile (SWAP), will remain unused, or will be used ineffectively.

Collection Priorities

Each type of repository has different approaches and priorities in respect of whether to collect full-text-content, which may be Open Access or not, or metadata-only records; this can be a major impediment to cross-repository interactions. It was apparent that, in many cases institutional repository strategy was far from definitive, and often seemed involved in an effort to reconcile the objectives of Open Access collection and dissemination with the

TABLE 2 Technical Factors Influencing Repository Harvesting

What technical factors might influence your decision to source content from another repository? Please rate on a scale of 1–5, 5 being the most important.

Item	5	4	3	2	1	N/A	Average	Total
Easy to implement and use interface	38.5%	30.8%	26.9%			3.8%	4.0	26
Able to get full text as well as metadata	40.7%	44.4%	3.7%	7.4%		3.7%	4.1	27
Clear mechanism for updates (addition, changes & deletion of material)	34.6%	26.9%	34.6%			3.8%	3.8	26
Ability to identify your institution's output easily	74.1%	18.5%	3.7%			3.7%	4.6	27
Minimal processing after information transfer	44.4%	37.0%	14.8%			3.7%	4.1	27
Total responses to this question: 27								

TABLE 3 Cultural Factors Influencing Repository Harvesting

What policy & cultural factors might influence your decision to source content from another repository? Please rate on a scale of 1–5, 5 being the most important.									
Item	5	4	3	2	1	N/A	Average	Total	
Quality of metadata in the source repository	40.7%	48.1%	7.4%			3.7%	4.2	27	
Trust in the source repository (high quality content, well managed repository etc)	61.5%	30.8%	3.8%			3.8%	4.4	26	
Well defined versioning policy	26.9%	34.6%	30.8%	3.8%		3.8%	3.7	26	
Clear understanding of the rights & permissions for transferred material	48.1%	44.4%	3.7%			3.7%	4.3	27	
Good match between the metadata supplied and your minimum required fields	26.9%	53.8%	15.4%			3.8%	4.0	26	
Total responses to this question: 27									

institutional requirements of research administration and meeting external reporting requirements, especially those of the Research Excellence Framework (REF). The practical effect is that repositories may tend to collect metadata, because it is much easier to obtain and process in large quantities and is not subject to the sort of usage restrictions that usually attach to the full-text object.

As for funders, while declared commitments to Open Access and object preservation are not to be dismissed, it must be borne in mind that the repository plays a critical role as a mechanism for relating funding inputs to research outputs. Funders must be accountable for the money they spend on research; and under the Government's Economic Impact Reporting Frameworks an obligation is laid on the Research Councils to produce metrics that demonstrate the "economic impact" of public investment in research using measures of outputs and outcomes. Research Councils UK (RCUK) has shown serious interest in the possibility of exploiting data gathered in institutional repositories to meet its reporting obligations. While this, again, places emphasis on the administrative function of the repository, it may be a significant driver of standardization and quality control of metadata, given the importance to the RCUK of unambiguous author identification and classification coding that maps to the UCAS Joint Academic Coding System (JACS) and the Higher Education Statistics Agency (HESA) departmental cost centers. It is also essential to the funder that output metadata includes information identifying the funder and funding grant (see the Research Information Network guidance on *Acknowledgement of Funders in Scholarly Articles*). At present this information is rarely included in the basic metadata set created in institutional repositories.

From a Repository-Centric to a System View: The Issue of Trust

Some stakeholders in the software development field questioned the assumption that interaction between repositories need be in the form of content transfer. The bulk transfer of material from one repository to another, so that multiple copies and versions of a digital object and its metadata exist in different locations, would seem, on the face of it, a very uneconomic information system but ensures that each repository holds the content locally and is not

dependent on other repositories. Arguably, what is required is a perceptual shift from a repository-centric view based on information ownership to a systemic view based on the creation of information maps or pathways. The *Open Archives Initiative Object Reuse and Exchange* (OAI-ORE) specification proposes a model that instead of duplicating and transporting data creates aggregated views of information held at different web locations (or URIs) by relating the information units to each other in a Resource Map, itself identified by a URI. The ORE specification can provide a structural description of a complex object (e.g., a book) and its constituent parts (e.g., chapter files), and can use this description to “create” the object by aggregating the component files in their proper relationships. There is no need for these files to be grouped together at the same address. The ORE treats the Web as a single vast database of information capable of sustaining a variety and complexity of interrelationships. Some software developers argue that effort should be directed not at creating solutions for the transportation of content between repositories, but at creating overlay services that will provide semantically rich gateways to content distributed across the Web.

These are economic models of information traffic, which offer flexible and sophisticated structures for the description of complex relationships between objects, such as version, alternative manifestation, and associated data relationships. But, it may be that they will only work on a large scale in a system that has a strong community identity and a high level of trust among stakeholders, since the participating repositories would have to guarantee the persistence and usability of the digital objects in their care. As yet, these conditions do not exist, although there are promising signs of their evolution in the ongoing work towards an ISO standard on the audit and certification of trusted digital repositories.

Scenarios: Potential Ways Forward

In this complex landscape of policies and practices, SIRIS did not identify a consensus about what would constitute the ideal state of repository interactions. The authors’ response was to develop and explore possible scenarios for the future evolution of repository interactions. These scenarios are conceived under pressure from key *drivers*, which express systemic needs that are sufficiently common to

influence the direction of developments. Four principal *drivers* of evolution in repository interactions have been identified:

- population of repositories;
- collection and analysis of metrics;
- preservation; and
- aggregation of research outputs.

Each of these drivers has been analyzed into a number of *enablers*: facilitating conditions or activities. They may not be necessary or sufficient factors in the evolution they facilitate, but they indicate possibilities for the future development of repository interactions.

Driver 1: Population of Repositories

Population of repositories to the critical mass level is the essential precondition of a mature and viable repositories system. Arguably this in itself will generate the momentum to overcome many of the cultural, political, and technological barriers that have been described in our findings.

ENABLERS

- *A simple repository deposit process embedded in author workflows.* The SWORD standard deposit mechanism and developments in Current Research Information Systems (CRIS) are models likely to be adopted by HEIs managing repositories. This issue was identified in most interviews and in the free text of the questionnaire as being of great importance.
- *National research assessment and reporting requirements.* Researchers and institutions have a professional and collective interest in engaging with research assessment exercises, and this can be harnessed to the benefit of repositories.
- *Greater use of the OAI-PMH protocol to enable content transfer.* This will occur as solutions are found to the problems of locating relevant content and establishing trusted relationships between repositories.
- *Use of the Scholarly Works Application Profile (SWAP) to provide semantic equivalence for data exchange.* The SWAP can be integrated with

repository software and offers a structured and semantically rich descriptive profile, with capacity for version identification and for funding and grant data. There is, as yet, little take-up of the profile.

- *Integration of deposit into publishers' workflows.* Direct deposit by publishers, if applied widely, could greatly increase overall deposit rates and metadata quality. It remains to be seen whether publishers would buy into a process with little apparent benefit for them.

Driver 2: Statistics and Metrics

The exploitation of repository data to support institutional and national research assessment processes was a theme that emerged very clearly from this study.

ENABLERS

- *The requirement on HEIs to participate in the REF and on Research Councils to meet the requirements of the Economic Impact Reporting Frameworks. Research Councils UK (EIRF).* Both of these national reporting exercises are focusing on institutional repositories as a source for high quality metrics and will drive the development of metadata standards.
- *The Publisher and Institutional Repository Usage Statistics (PIRUS) project* aims “to develop standard COUNTER-compliant usage reports at the individual article level.”

Driver 3: Preservation

The authors feel strongly that the requirement on repositories to preserve content for which it is responsible, and to guarantee the continued usability of that content, must be taken seriously and incorporated into policies if repositories are to interact together in relationships of trust.

ENABLER

- *Work in progress towards the ISO standard on Digital Repository Audit and Certification.* Work is being undertaken to define the

criteria by which a repository should be audited and certified as a trusted repository. Implementation of this standard could have an immense effect on confidence in the repository system and enhance the quantity and quality of repository interactions.

Driver 4: Aggregation of Research Outputs

The production of scholarly works must be set within the ensemble of research production and communication processes, and related to other types of publication, notably datasets.

ENABLERS

- *Ongoing developments in implementation of data repositories and linking technology.* Notable recent and current work in this area includes: the Citation, Location and Deposition in Discipline and Institutional Repositories (CLADDIER) project to develop a linking mechanism between published data and data citations in published papers; the Source-to-Output Repositories (StORE) project “to provide use cases, guidelines and tools for the integration of data archives with repositories of research publications”; and the UK Research Data Service (UKRDS) study “to assess the feasibility and costs of developing and maintaining a national shared digital research data service for UK Higher Education sector.”
- *A general model for the description and exchange of aggregations of web resources.* The OAI-ORE specification and other models for describing aggregations of distributed web resources offer imaginative challenges to the received idea of repository interaction as the duplication and transfer of digital objects. These models promise significant innovation in the total economy of repository interactions as the system matures.

SIRIS Recommendations

The SIRIS report made seven recommendations for practical steps that can be taken in the immediate or near future. These recommendations were grouped into three categories: *standard-*

ization, best practice, and community engagement and dialogue. They were addressed variously to JISC, funders, repository managers, publishers, software developers, and content creators.

Standardization

These recommendations were concerned with the creation and adoption of standards to aid information exchange and sharing.

1. Clear identification of authors, funders, and HEIs

The guidance on *Acknowledgement of Funders in Scholarly Articles* published by RIN and the individual and institution name authority system in development by The Names Project should be adopted by the repository community and promulgated to researchers.

2. Adoption of information interchange standards

A common information interchange standard should be adopted. Consideration of the adoption of the Scholarly Works Application Profile (SWAP) (http://www.uk.in.ac.uk/repositories/digirep/index/Eprints_Application_Profile_Scholarly_Works_Application_Profile) as a potential solution should be investigated by community members.

3. Trust in other repositories

A watching brief should be kept on development of the ISO standard on Digital Repository Audit and Certification, and repository managers should work towards certification once the standard is published.

BEST PRACTICE

These recommendations are concerned with achieving consistency through good practice.

1. Provenance information within transferred records

Records transferred from one system to another should contain visible provenance information contained within the bibliographic record. As a minimum this should include the source repository identifier, the transfer date and rights information.

2. Clear versioning identification at object and metadata levels

The Version Identification Framework (VIF) guidelines for version identification should be promulgated and adopted,

so that both the digital object and metadata have sufficient information for an end user to identify and disambiguate multiple versions.

COMMUNITY ENGAGEMENT AND DIALOGUE

These recommendations are concerned with the wider landscape and engaging with those who interact with repositories.

1. **Repository community forum**

There should be established a UK-wide group where representatives of funder and subject repositories can meet representatives of the institutional repository community for further discussion and agreement on standards and protocols.

2. **Continued user engagement**

Work should be ongoing to identify the needs of end users, and to ensure that development is not driven by the administrative requirements of those who fund and manage repositories.

Conclusion

As a relatively recent growth in the academic information landscape, repositories have yet to prove their necessary place within the system of established relations between HEIs, funders, researchers, and publishers. This study has established that there is currently little communication and exchange of information between repositories but much interest in this area. At present the principal challenge for repositories is the collection of content. Considerations of preservation and discovery are necessarily subsidiary to the primary requirement of acquiring content that can be used, preserved, and made available.

This report grants the premise that there will be an evolution towards critical mass in institutional repositories, and that, as this happens, there will be a shift from a repository-centric focus to the systemic view of an integrated repository network, in which the activities of institutional, subject and funder repositories will be co-ordinated and mutually supporting. As this evolution occurs, and content archiving becomes firmly embedded in organizational practices and author workflows, the problem of collection will yield place to the concerns of content description, curation, discovery and reuse, with attention focused on

metadata standards, version identification, linking to related objects, and collection of metrics. It is in this stage of development that the nature and richness of interactions between repositories will be critical to the success of the repositories system as a whole.

Repository management is an intensive process, demanding substantial administrative effort in the mediation of deposit and quality assurance of metadata. Given that many repositories are currently operating on a relatively small scale and are very far from having achieved critical mass, concern over the scalability and viability of individual repositories is understandable. This uncertainty and the absence of community consensus on issues such as metadata standards, version identification, and content licensing affects the willingness of repository managers to engage with other repositories. But it is to the benefit of all stakeholders that effort be directed towards fostering a climate of mutual trust. Funders and HEIs are aligned in their requirements for administrative information, and have an equal interest in promoting Open Access to research and preservation of research outputs. Policies, practices and solutions should be implemented in a co-ordinated manner throughout the system of repositories; for this it is essential that all stakeholders, and especially funder and institutional repository managers, work together in the creation of an integrated system and the definition of shared standards.

References

- Acknowledgement of Funders in Scholarly Journal Articles: Guidance for UK Research Funders, Authors and Publishers*. Research Information Network. Feb. 2008. Web. 21 July 2009. <<http://www.rin.ac.uk/funders-acknowledgement>>.
- arXiv.org*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://arxiv.org/>>.
- Citation, Location and Deposition in Discipline and Institutional Repositories (CLAD-DIER)*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://claddier.badc.ac.uk/trac>>.
- Digital Repository Audit and Certification*. 6 May 2009. Web. 21 Jul. 2009. <<http://wiki.digitalrepositoryauditandcertification.org/bin/view>>.
- Economic Impact Reporting Frameworks*. Research Councils UK. (EIRF). 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.rcuk.ac.uk/aboutrcuk/eirf>>.
- ESRC Society Today*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.esrc.ac.uk/ESRCInfoCentre/index.aspx>>.
- Jones, C. M., R. M. Darby, L. D. Gilbert, and S. C. Lambert. *Report of the Subject and Institutional Repositories Interactions Study*. JISC Information Environment Repository. 26 Nov. 2008. Web. 21 Jul. 2009. <<http://ie-repository.jisc.ac.uk/259/>>.

- Open Archives Initiative Object Reuse and Exchange*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.openarchives.org/ore/>>.
- OpenDOAR Directory of Open Access Repositories*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.opendoar.org/index.html>>.
- Publisher and Institutional Repository Usage Statistics (PIRUS)*. JISC Information Environment Repository. 1 Dec. 2008. Web. 21 Jul. 2009. <<http://www.jisc.ac.uk/whatwedo/programmes/pals3/pirus.aspx>>.
- RePEc Research papers in Economics*. 16 Jul. 2009. Web. 21 Jul. 2009. <<http://repec.org/>>.
- Source to Output Repositories (StORe)*. Web. 16 April 2009. Web. 21 Jul. 2009. <<http://www.data-archive.ac.uk/randd/store.asp>>.
- SWORD: Simple Web-service Offering Deposit*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.swordapp.org/>>.
- The Names Project*. 19 Jul. 2009. Web. 21 Jul. 2009. <<http://names.mimas.ac.uk/>>.
- UK PubMed Central*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://ukpmc.ac.uk/>>.
- UK Research Data Service (UKRDS)*. 21 Jul. 2009. Web. 21 Jul. 2009. <<http://www.ukrds.ac.uk/>>.
- Version Identification Framework (VIF)*. 4 Mar. 2008. Web. 21 Jul. 2009. <<http://www.lse.ac.uk/library/vif/>>.