Towards a Research Repository for Oxford University

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Introduction

1. In 2005 the Digital Archiving Group, a working group of Oxford's Information and Communication Technologies Committee (ICTC), suggested that a pilot project for the digital archiving of scholarly papers be developed. To support this suggestion, and to investigate the wider issues relating to eprints and institutional repositories, a workshop was organised on 10 June 2005 (see Programme in Appendix B). The purpose of the workshop was to investigate the opportunities and challenges of developing an open access institutional repository for research. The workshop was organised under the aegis of the Digital Archiving Group, a working group of the Information and Communications Technology Committee (ICTC), and in association with the Oxford Internet Institute, the Research Technologies Service (OUCS), and the Systems and Electronic Resources Service (OULS).
2. This document is derived from an earlier briefing document entitled, *Towards a policy for open access to research at Oxford University : briefing document*, which was produced for, and considered by, participants at the research repositories workshop. The purpose of the document is to provide a summary of progress thus far, including a series of recommendations put forward, and further refined, at the June workshop. The document was received by the Digital Archiving Group on 28 Feb 2006.
3. Since June 2005 there have been a number of developments of which this document takes some account. These include:

(a) Submission of a proposal from OULS to ASUC (Strategy) to establish the practical steps for the development of a production-level institutional repository service;

(b) Agreement from PRAC to budget for the recommendations arising from the ELISO consultancy, including the provision of 2 FTE to support an institutional repository;

(c) The establishing of an ICT Strategy Programme with an aim to "ensure a co-ordinated and coherent approach to the development, deployment and support of ICT services to underpin the collegiate University's teaching, learning, research and administration systems".[1]

(d) Funding from JISC for the Accessing and Storing Knowledge (ASK) Project which is developing a suite of open source software artefacts that support learners, researchers and teachers in securely accessing and sharing learning objects (led by OUCS-LTG); and participation in the JISC-funded RIVER Project which is scoping practice, requirements and recommendations relating to the identification of items within digital repositories (OUCS-RTS). Both projects operate within the context of the JISC Repositories Programme, within which there are a number of other relevant activities which may inform the development of an institutional repository service for Oxford University.

(e) Participation in a number of e-research activities, notably three JISC Virtual Research Environment projects, the development of a campus computing grid, and the renewal of funding for the Oxford e-Science Centre (to be subsumed into the Interdisciplinary e-Research Centre).

Institutional repository architecture

4. This document is essentially concerned with the provision of an institutional *research* repository rather than the broader concept of an *institutional* repository. In this respect, a research repository might be considered a sub-component or 'service' of an institutional repository. The latter might be better viewed as an over-arching framework, architecture, or even hub comprising a mixture of core components or shared infrastructure, presentation interfaces and underpinned by a set of agreed standards and policies. Therefore, within this framework might exist a series of distributed repositories to support the curation and provision of a variety of object or domain types, together with the development of added-value services making use of underlying infrastructure and interoperating with one or more repositories. The physical location of the data may become less

significant than the ability to harvest and manage the metadata. It will be important, however, in the development of any such framework, to identify the priorities of the key stakeholder groups within the University. Examples may include:

(a) The development of an e-theses policy and process, for both Masters and DPhil theses;[2]

(b) Workflows and applications to enable the reuse and contexualisation of research data or outputs within a virtual learning environment, and interoperating with a learning objects repository;[3]

(c) Integration of Oxgrid, the University's campus computing grid, with a data repository and/or underlying filestore infrastructure.[4]

5. Many of these issues fall under some combination of the remits of an institution's information strategy and ICT strategy.[5]

Recommendations

6. The following recommendations were either refined by or arose out of the workshop held on 10 June 2005. They relate to the establishment of an institutional research repository within an overall framework integrating scholarly communication and digital curation. These recommendations are intended to build upon, and bring into production, activities already being undertaken within the University (and further described below):

    i. To establish a scholarly communications forum or other appropriate cross-divisional body to investigate, evaluate, facilitate and raise awareness about new models and related issues for the production and dissemination of Oxford University scholarship.

    ii. To develop supporting policies, guidelines and incentives to enable members of the research community to self-archive research publications within Oxford's research repository, and in any case, to provide the infrastructure to enable grant-holders to comply with current or future open access policies of the Research Councils and other funding bodies.

    iii. To establish an institutional research repository, led by OULS with support from OUCS and in consultation with and agreement of the academic divisions.

    iv. To provide recurrent central funding from an appropriate source in order to support at least 2 FTE and the necessary hardware requirements.

    v. To make freely available the research output, across subject areas, of the University through provision of an open access repository.

    vi. To investigate the appropriate and effective place of a research repository within the overall management of the institution's research record, including bibliographic metadata and, where agreed, fulltext as part of RAE 2008.

    vii. To provide support and guidance on intellectual property rights to ensure that researchers have the right to deposit research publications and, where appropriate, supporting data within an institutional research repository.

    viii. To work in partnership with scholarly publishers to enable access to and the curation of Oxford's research output.

    ix. To ensure that the research repository conforms with any agreed institutional repository framework, including conformance with relevant open standards and active collaboration with other stakeholders involved in the development of institutional repository infrastructure or value-added services within the University.

Background

7. An institutional repository for research is an online service developed and maintained by an institution, such as a research-led university, in which researchers across all subject areas are

encouraged to deposit an electronic copy of each research output (whether journal article or otherwise), preferable for unrestricted access by anyone with an Internet connection, and for longer-term curation by the institution. Whilst the current emphasis is on the deposit of research outputs, there is an increasing need to manage curation and access to research data.

Research data and e-infrastructure

8. Scholarly communication practices vary between the disciplines and there is not common agreement across disciplines about what should be treated as a research 'output' (from Powerpoint presentations, software and multimedia, conference presentations, to edited essay collections and monographs). A research repository potentially has to handle a wide range of publication types and datasets both huge and small. A single institutional policy for all types of digital object may not be appropriate. Data is not always obviously data, especially within the humanities and social sciences. Composite objects, where the value of the whole lies in the relationships between different but integrated parts, present particularly complex challenges. Peer-reviewed scholarly publications with structured, familiar metadata are therefore the low-hanging fruit for a research repository. The problems presented by research data are far more difficult to resolve with little institutional infrastructure currently in place to address the curation of often heterogeneous, unstructured, subject-specific, multimedia research 'data'. Peer-review is far less established for data and therefore data retention and deletion policies are difficult to formulate. In any case, data associated with null results also has potential usefulness but is difficult to capture and data generated within one research domain may have unexpected use within another. For these, and other reasons, institutional repositories are to be preferred over subject-based repositories for the deposit of research data.[6]
9. Research across all disciplines now generates petabytes of data and increasingly researchers are judged on the quality of their databases as well as their outputs. It is also becoming common, at least within certain science subjects, for journals to make the availability of data a condition of publication. Open access to research data strenghthens the peer-review process as well as enabling public review of research. The re-presentation of research data within virtual learning environments also helps complete the lifecycle of the research process. The development of national e-infrastructure, as defined by the UK's Science and Innovation Framework, assumes the existence of research repositories as key components. In the US, the NIH make it a condition of award to have in place a data management and sharing policy. Whilst the current draft RCUK policy focusses on resource papers, it is not unlikely that, in due course, the policy will be extended to include research data. Interoperability between both national and local e-infrastructure, especially national data archives, is essential. Other issues which will need to be addressed by local as well as national research repositories include the security of data, ownership and responsibilities (especially with regard to inter-institutional consortia or virtual organisations); and the development of specific toolsets and research environments which interoperate with repositories.[7]

Open Access

10. A research repository which has enabled unrestricted access to research outputs or data is commonly known as an 'open access' repository. The open access component is a presentation and interoperability interface to an institutional research repository. An open access repository includes interoperability with other repositories and online search engines which has the potential to enable wide access to, and greater impact of, any given research publication.[8] Software to implement an open access repository is available either freely available under an Open Source Software licence or as part of a commercial solution. An institution's commitment to supporting a research repository would include staff costs for customising the software, awareness-raising and training, and for the curation of the digital objects deposited in the repository. An essential element of an institution's commitment to an open access research repository is the development

and publication of an agreed policy.[9]

11. The development of 'open access' policies has been largely driven by the principle that the results of publicly-funded research should be freely available to all. The now pervasive nature of the World Wide Web provides the underlying infrastructure to enable the dissemination of research outputs speedily and efficiently by the research community. The call for open access to research results coincides with (and is also partly driven by) the increasing cost of journal subscriptions, especially within science, technology and medicine. Members of the academic research community already provide no -- or low-cost services to publishers of academic journals, whether through refereeing articles, as members of editorial boards, or serving as journal editors. Journal articles rarely come with royalties, unlike many scholarly book publications, and yet many researchers are asked to assign copyright to the publisher, receiving back limited rights to copy and distribute the published article. The growth of open access repositories and policies, however, has led a significant number of publishers to amend their publishing contracts to permit authors to deposit a copy of the peer-reviewed article in an open access institutional or subject repository. Indeed, a number of publishers request that its is the publisher's own copy-edited and formatted version of the article which is deposited.[10]

12. From a researcher's perspective, an institutional repository has the potential to provide a secure location for research publications at various stages in their production (e.g. Pre-refereed pre-prints for comment as well as post-refereed post-prints for wide distribution). The deposit of one copy of a publication in electronic form together with some basic metadata provides the potential for multiple re-use (e.g. generating bibliographies for CVs, department research reports, listings of publications and people for public web pages, funding bodies etc).

13. The act of depositing a digital copy of a research publication within an institutional repository should take no more than 30 minutes which comprises time spent completing some basic metadata details about the publication (author, title, format, keywords, ,place of publication, date etc) and uploading the publication (e.g. as PDF file).[11] The metadata is exposed by the repository and harvested both by search engines (e.g. Google, Google Scholar, and Yahoo), and Open Archive Initiative (OAI) services which aggregate metadata from a variety of open access repositories to build general or specialised search services (e.g. OAIster[12]). It is also possible to prevent public access to the fulltext of a publication, even if the bibliographic data is publicly available (e.g. if the publication is in an early stage or embargoed for some reason).

Intellectual Property Rights

14. An institution's intellectual property rights policy is especially relevant to the filling of an institutional repository. Oxford University's policy is to claim ownership over works generated by computers, multimedia, lab notebooks (and other materials created using University facilities). The University will not claim ownership over artistic works, books, and articles. IPR is likely to be split between the University and the individual author when any compiled form of data and research output is being considered for deposit in an institutional repository. However, whilst the University's rights policy addresses the individual, in actual fact many outputs and supporting data are created by teams (and not necessarily within the same institution). Co-authorship, and so co-ownership, can be a particular challenge since the concepts can have significant differences of meaning within academic and legal contexts. Assigning all rights to a publisher is not good practice and authors should consider licensing only those rights which are necessary for the publisher to fulfil their side of the contract. The success of any institutional repository will depend on institutions taking more of an interest in authors' agreements with publishers and the production of policy or guidelines may be particularly helpful.[13]

Advocacy and buy-in

15. The successful development of a production research repository depends not only on the

implementation of an appropriate technical infrastructure but crucially on the integration of the repository with the business of the University – the discovery and dissemination of knowledge. The policies and processes associated with the repository should be 'owned' by the University research community, including senior staff and decision-making bodies. A clear communications programme, including dedicated advocacy, is essential. Whilst mandating deposit within the repository may not be necessary or desirable, it is possible that policies developed by grant-awarding bodies for the deposit of research outputs may prove to be the trigger to change culture within an institution.[14]

Oxford context

ICT Strategy Programme

16. The University launched an **ICT Strategy Programme** in Michaelmas Term 2005 with the overall aim of formulating an ICT strategic plan for the collegiate University in accordance with its corporate plan, together with a proposed implementation plan.[15] The Programme is due to complete in Trinity Term 2006. Two terms of reference are of particular relevance to the development of a research repository:

    - ensure a co-ordinated and coherent approach to the development, deployment and support of ICT services to underpin the collegiate University's teaching, learning, research and administration systems;
    - make recommendations regarding priorities and resource requirements to ensure the collegiate University is best placed to take advantage of innovations and best practice in ICT development.

17. The first of these relates to ICT decision-making across the collegiate University which is a particular concern of the Strategy Programme. The Programme is led by an overall Steering Group which comprises representatives from the academic divisions and colleges as well as support services. The development of the Strategy is primarily being undertaken through a series of Work Tasks (WTs). Whilst there is no one Work Task dedicated to the ICT requirements of the research community, the task of identifying ICT infrastructure to support and enable research is shared across Work Tasks dedicated to requirements analysis (e.g. WTs B and D) and the detailing of the likely large-scale investments in ICT the University will be expected to make over the next five years (WT I).

18. **OULS submitted a proposal and costings to the ASUC Strategy** meeting in Dec 2005 to establish a production-level institutional repository for the academic research output of the University, including theses (as per the recommendation of the Eliso Report). The repository would be developed under the oversight of a project advisory board. The proposal suggests that the responsibility for developing repositories for other types of digital object (e.g. learning objects) should lie elsewhere. The budget (over three years) specifies two FTE, to be charged to the Eliso budget, together with software licence and maintenance costs, for which the funding source is to be decided. The proposed software solution is VTLS Vital.[16]

Oxford Projects

19. OUCS, through the Learning Technologies Group (LTG) are leading the **Accessing and Storing Knowledge (ASK) Project** with funding from the JISC. The ASK Project, which runs for two years from June 2005, aims to develop a suite of open source software artefacts that support learners, researchers and teachers in securely accessing and sharing learning objects.[17] The Project is undertaking this through the implementation of a reference repository model derived from the JISC e-framework. Working within the framework definitions the Project will also implement services relating to metadata management, content management, authentication, and authorisation. ASK builds on previous projects relating to access management and federated

searching and intends to integrate systems which support teaching and learning (e.g. Weblearn) with information systems. The project operates in partnership with UHI Millenium Institute and the University of Manchester.

20. OULS is a development partner in the **DART-Europe (Digital Access to Research Theses – Europe)** initiative to explore the creation of a European model for the deposit, discovery, use and long-term care of research theses in an open access environment, led by UCL and Dartington College of Art.[18] The Project is developing a portal through which institutions with existing repositories will be able to expose their theses, and also a repository platform for those institutions lacking repository services.
21. OUCS, through the RTS and LTG, are also contributing to the JISC-funded **River Project** which is undertaking a scoping study on the practice and issues associated with identifying objects and their versions within institutional repositories.[19] The project is led by Rightscom Ltd, in partnership with Oxford and the Library of the London School of Economics. The report will be completed by April 2006.

22. In common with other journal publishers **Oxford University Press** (OUP) has developed its own policy for the self-archiving of eprints in institutional repositories whereby permission is granted twelve months after publication. Authors are encouraged to link to the publisher's version rather than the author's own version. OUP is also piloting a small number of open access ('author-pays') journals with deposit of articles in central repositories like Pubmed Central (where appropriate). Whilst OUP continue to experiment with different publishing models, they also have some concerns about revenue loss or subscription cancellation as a result of open access publishing or archiving.[20]

23. Oxford, through OULS, has been a participant in the **Sherpa project** since it started in Nov 2002. As a result a pilot Oxford eprints repository is available at http://eprints.ouls.ox.ac.uk/. However there is no overall collection strategy or policy for deposit of research publications. Within the Sherpa project Oxford had a partnership with OUP whereby the Press has supplied the metadata for over 350 fulltext articles by Oxford authors published in OUP journals.[21] At the time of writing the Oxford eprints repository contained 541 items, the bulk of which originated from OUP. The Sherpa Project funded 0.5 FTE within OULS for awareness-raising activities and technical support for the repository itself was provided by SERS as resources permit. The current phase of the project ended by Nov 2005.

24. Oxford also made a smaller contribution to the JISC-funded **ePrints-UK** project which aimed to build subject-based search services from metadata harvested from institutional repositories (including Oxford's).[22] The Research Technologies Service, through the Humbul Humanities Hub, participated in ePrints-UK by hosting a national workshop and undertaking local awareness-raising activities jointly with staff from OULS involved in the Sherpa Project.

25. It is also worth noting that the **Mathematical Institute** runs its own eprint archive (http://eprints.maths.ox.ac.uk/), containing around 160 eprints (including 54 theses) deposited by the Institutes's own staff and research students.

26. Oxford is participating in three JISC-funded **Virtual Research Environment (VRE)** projects, two of which are especially relevant to the establishment of a research repository.[23] The Building a VRE for the Humanities (BVREH) Project is undertaking a user requirements analysis across the Humanities Division to identify aspects of the research process which would benefit most from the development and implementation of VRE tools. The Integrative Biology VRE project is developing tools to support day-to-day research activities within the international Integrative Biology consortium. The results of a requirements analysis exercise indicates that a key priority is the provision of "a secure, centralised repository of *in silico* experiments will allow experiments to be trivially reproducible by others, encourage and support best practice, and aid the training of new researchers".

27. The **Medical Sciences Division** is collaborating with the Academic Computing Development Team (ACDT) and the Research Technologies Service to develop an online Research Discovery Service (RDS) which will enable a systematic view of the research life and outputs of the Division.[24] It is expected that the RDS will interoperate with any institutional repository and appropriate subject repositories (e.g. PubMed Central) as appropriate.

Eliso

28. The report from the ELISO (an electronic library and information service for the University of Oxford) consultancy (Mar 2005), as part of a wide-ranging treatment and business plan for electronic resource provision for research within the University, made two recommendations concerning the establishment of an institutional repository:

> 4.1 A university-wide repository should be established for all material generated by authors in Oxford as a way of archiving academic output, rather than as an alternative publishing capability. Material should include (a) theses, dissertations and associated research materials, (b) peer-reviewed journal articles, (c) monographs, and (d) unreviewed material such as conference presentations.
>
> 4.2 The University should give serious consideration to harnessing the repository for internal university documents, in particular as a records management system which could be used both to establish an effective audit trail for research results and to automate returns and associated documentation for the Research Assessment Exercise (RAE).[25]

29. Elsewhere (40-44) the report observes that the major costs associated with an institutional repository are likely to be staff costs. Two FTE, relating to technical management and communications activities, would likely be sufficient to establish a fully supported eprints repository. The report recommends that a review of the repository be undertaken after two years to evaluate the success of persuading authors to deposit research publications and to assess the support overhead.

30. The budget for the institutional repository component of the Eliso recommendations was approved by PRAC and consists of funding for 2 FTE comprising a project manager and software engineer.

31. The consultation process undertaken by the Eliso team revealed, with respect to an institutional repository, a variety of views including: that humanities researchers would be reluctant to embrace a research repository so long as it was perceived to follow scholarly publishing models more common to the science disciplines; that there was broader support (from librarians at least) for the digital archiving of theses; that a research repository might assist in maintaining audit trails for research processes; that connecting the repository with the RAE would be beneficial; that subject-based repositories might be more appropriate than an institutional repository; and finally, that any repository had to be easy to use, containing a variety of publication types, and functionality which reflects the requirements of the research community.

UK context

32. In the UK concerted effort has been made by a mixture of government agencies, institutions and some notable individuals to adopt or investigate open access policies. The JISC, for example, has funded a significant number of technical, promotional, investigative and momentum-building projects (of which Sherpa, combining all of these aspects, is probably the most high-profile).[26] The future of scholarly publishing, especially relating to open access and the unsustainable pricing of journal subscriptions, was given particular prominence in the government and public arenas through the investigation of the House of Commons Science and Technology Committee and their subsequent report, “Scientific Publications: Free for all?” (July 2004). Within higher

education the discussion has also been driven by open access policies emerging from major funding bodies, especially the **Wellcome Trust**[27] and, more recently, Research Councils UK. Currently, Southampton University appears to be the only UK university with an explicit open access policy (though the number of universities with pilot institutional repositories numbers about 25). The Scottish universities, however, have recently endorsed the principles of open access and committed to a series of actions for implementation.

Research Councils UK[28]

33. The Research Councils UK (RCUK) published a position statement on access to research outputs in June 2005 and entered a period of consultation with the academic, publishing and library communities. At the time of writing (Jan 2006) no update on the status of the Position Statement had been released but a final version is expected in the first quarter of 2006.[29]

34. The statement is founded on four principles, as quoted from the draft statement:

    - Ideas and knowledge derived from publicly-funded research must be made available and accessible for public use, interrogation, and scrutiny, as widely, rapidly and effectively as practicable.
    - Effective mechanisms are in place to ensure that published research outputs must be subject to rigorous quality assurance, through peer review.
    - The models and mechanisms for publication and access to research results must be both efficient and cost-effective in the use of public funds.
    - The outputs from current and future research must be preserved and remain accessible not only for the next few years but for future generations.

35. In the current draft all eight Research Councils will require that journal articles arising from grants awarded from 2005/2006 be deposited either in an institutional or subject repository (with institutional being a preferred location), where one exists. It is assumed that such repositories are open access and conform with the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). The ability to deposit is dependent on both the existence of suitable repositories but also subject to appropriate copyright or licensing arrangements. On the latter point the draft statement questions whether the usual copyright-assignment arrangements between authors and publishers serve the interests of the authors, their employing institutions, funders and other stakeholders. The Councils are mandating deposit because whilst promotion of the benefits of open access are important, promotion alone is not sufficient (based on evidence to date) to guarantee a critical mass. There is also an expectation by the Councils that virtually all UK research institutions will have established eprint repositories.

36. The draft statement also acknowledges that digitisation and online repositories potentially enables research *data* to be made available alongside the published article. The statement also notes the distinction between open access to research data and outputs, and the long-term preservation of such material. On the latter point the statement observes that the British Library and other legal deposit libraries have a role to play in the preservation of digital publications and the Councils intend to work with the BL, JISC and others to investigate the potential an extension in remit to preserve and make accessible research publications and data in digital form.

37. Whilst the RCUK leaves institutions to address the financial costs incurred in the establishing of an institutional repository (though without obligation), it would seem plausible to suggest that some proportion of the recurrent costs could be recovered from funding bodies as a directly allocated infrastructure charge under Full Economic Costing (FEC) of research grant proposals.

38. The RCUK continue to be in dialogue with learned societies in particular who have expressed concerns about potential threats to existing business models.

39. Oxford's response to the initial RCUK proposal is included in Appendix A.

House of Commons Committee on Science and Technology

40. The report from the House of Commons Committee on Science and Technology, chaired by Ian Gibson MP, and published in July 2004[30] recommended that,

> all UK higher education institutions establish institutional repositories on which their published output can be stored and from which it can be read, free of charge, online. It also recommends that Research Councils and other Government funders mandate their funded researchers to deposit a copy of all of their articles in this way. (Summary, para 2)

41. The Committee received evidence from representatives of a wide range of organisations including Reed Elsevier, Oxford University Press, BioMed Central, British Library, JISC, Research Councils UK, and other members of the publishing and academic communities.[31] The full report contains 82 concluding observations and recommendations, many of which relate to journal pricing, library budgets and, to some extent, the so-called 'author-pays' model of some open access journals. The Committee noted the amount of public money invested in research and its outputs, and recommended the Government take a lead in establishing, "an efficient and sustainable environment for the publication of research findings". It was also observed that every academic should have access to the scientific literature necessary to undertake their job, irrespective of the nature of their institution. The same principle of access should also apply to members of the public. The Sherpa Project receives especial mention and indeed the Committee recommended that the project should be allocated additional funding to enable all research institutions to establish and maintain digital repositories. Grant-awarding bodies, especially the research councils, were recommended to mandate funded researchers to deposit a copy of all research outputs in an institutional repository (including articles based on negative results). The pillars of peer-review and quality-assurance remain key, however. Finally, it was noted that institutional repositories should be a key component in the long-term preservation of digital publications(together with regulations for the legal deposit of non-print materials).

42. It is worth noting that whilst the Government's response to the Committee's report was fairly non-committal with respect to the recommendations made, it did, "recognises the potential benefits of Institutional Repositories and sees them as a significant development worthy of encouragement. But it believes that each Institution has to make its own decision about Institutional Repositories depending on individual circumstances."[32]

UK HE Institutions

Southampton University[33]

43. Southampton University, especially through the effort of Professor Steven Harnad[34], has pioneered the establishment of eprint repositories and, more recently, an institutional policy for open access. Indeed, the development of GNU Eprints, a popular open source software solution for implementing an eprints repository was developed at Southampton's Electronics and Computer Science Department.

44. The JISC-funded **TARDis** (Targeting Academic Research for Deposit and Disclosure) Project, effectively built Southampton's research repository ("e-Prints Soton").[35] Southampton's research repository aims to capture the research record of the university. It is notable that the project consulted widely amongst academics and across disciplines.[36] Enhancements made to the GNU Eprints software catered for the wide range of research materials across subjects. It is also notable that the university will use the eprints repository as the central RAE 2008 management tool (with RAE-specific features being added to the software). The requirement to create metadata as part of the RAE record has now been linked at Southampton with an invitation to deposit the fulltext of the research output at the same time.[37]

45. The experience of the TARDis Project resulted in a careful use of terminology. The coupling of institutional repository and open access in the same context had tended to create confusion. Other changes in terminology included the move from preservation to secure storage. The emphasis is on research repository rather than only eprints. Institutional agreement came through a combination of requirements analysis to determine how academics were already disseminating research outputs, and the appointment of a Pro-Vice Chancellor to 'champion' the activity. The repository has evolved into an institutional publications database and one of the selling points is its potential to minimise the proportion of time devoted to research reporting. The repository now underpins Southampton's RAE process with the integration of basic RAE management interfaces. Previously, research reporting and so the maintenance of publication databases were the responsibility of departments. The centralisation of the research repository included the importing of data from various distributed publication sources. Although centralised, most academic Schools have branded presentation interfaces and some additional functionality. The latter includes RSS feeds for individual academics and lookups for publisher policies. The repository is integrated with the research process and holds around 5,000 metadata records together with around 1,500 fulltexts. Content includes the deposit of entire project documentation for delivery to funding bodies as part of the project reporting procedures. However, the emphasis remains on postprints rather than preprints or grey literature. Mediated deposit is offered via the Library as well as self-archiving. The former, which is labour intensive, is not viewed as sustainable. The cost of running the repository is difficult to establish (since it is integrated within the research infrastructure) though as a project 0.25 manager; 1.0 project officer and 0.6 technical support were allocated.

46. Southampton is also the only UK institution to have registered the presence of an open access policy. Whilst Southampton's formal policy does not appear to be available online, a summary of it has been provided by Steven Harnad for the *Registry of Institutions with Self-Archive Open Access Policies* (Jan 2005) which is worth quoting in full since it provides a succinct summary of how the preceding declarations and policies might be implemented within an institution:

> The University of Southampton is to make all its academic and scientific research output freely available. A decision by the University to provide core funding for its Institutional Repository establishes it as a central part of its research infrastructure, marking a new era for Open Access to academic research in the UK. Until now, the databases used by universities to collect and disseminate their research output have been funded on an experimental basis by JISC (the Joint Information Systems Committee). The University of Southampton is the first in the UK to announce that it is transitioning its repository from the status of an experiment to an integral part of the research infrastructure of the institution. Southampton established its repository (http://eprints.soton.ac.uk/) in 2002 as part of the JISC TARDis project (Targeting Academic Research for Deposit and Disclosure), to explore issues surrounding the Open Access paradigm. The repository provides a publications database with full text, multimedia and research data. The Southampton repository will now become a service of the University Library in partnership with the University's Information Systems Services and its School of Electronics and Computer Science (who host the JISC-funded software development team).[38]

Sherpa Project

47. The JISC-funded Sherpa (Securing a Hybrid Environment for Research Preservation and Access) Project[39] has helped set up pilot institutional eprint repositories at around twenty UK HEIs. The project, led by Nottingham University, is also investigating many of the key issues in establishing and populating institutional repositories[40] as well as undertaking a broad range of promotional activities. The project has undertaken a preliminary analysis of the spread of eprint repositories within the UK.[41] For example, of the twenty top universities by research grant funding, fifteen have one or more online eprint repositories (including Cambridge, Oxford and UCL). Sixteen of

the nineteen Russell Group universities have eprint repositories (exceptions are Manchester, Cardiff and Liverpool), with a clear overlap between the two lists.

48. However, whilst the majority of the top research-led universities have eprint repositories (most of which established via JISC-funded projects), the number of items contained within the repositories appears to confirm the RCUK's view the promotion and encouragement are not sufficient to ensure a critical mass of content. In addition, given that the majority of repositories were setup with project funding, there is little evidence that the repositories either form part of the institution's core research infrastructure or are accompanied by a formal policy (Southampton is an exception as described below).

ePrints-UK

49. The **ePrints-UK** project, also funded by the JISC and led by the Resource Discovery Network, investigated the harvesting and aggregation of metadata from a range of institutional repositories with the intention of building a subject-based search service.[42] In Jan 2006 the project was harvesting metadata from 26 eprint repositories (not all of which were based in the UK). The top five UK HEI repositories ranked by the number of eprints held (with figures for May 2005 in brackets) were:

    - ECS EPrints Service, Southampton – 9,705 (9,225)
    - e-Prints Soton, Southampton – 7,923 (5,079)
    - Glasgow ePrints Service – 2,315 (1,062)
    - Oxford Eprints – 541 (496)
    - Edinburgh Research Archive – 317

50. In addition, the CCLRC ePublication Archive holds 21,406 items and the White Rose Consortium ePrints Repository, 864 items.

JISC Digital Repositories Programme

51. The JISC is running a significant Digital Repositories development programme under which, for example, the ASK and River projects are funded.[43] Enabling integration of, and building added-value services from, institutional repositories is also a strategic priority with the expectation that further JISC development funding will be available during 2005/2006. Other projects funded during 2005 within this strand which may usefully inform the development of Oxford's institutional repository (and research repository in particular) include:

    - Citation, Location, And Deposition in Discipline and Institutional Repositories (CLADDIER) – linking publications with data across two institutional repositories.
    - IRIScotland: Institutional Repository Infrastructure for Scotland – looking at the organisational and cultural change together with the overall framework necessary to implement institutional repository infrastructure across Scottish institutions.
    - R4L: Repository for the Laboratory -- addressing the area of interactions between repositories of primary research data, the laboratory environment in which they operate and repositories of research publications.
    - RepoMMan: Repository Metadata and Management – looking at automating the production of metadata together with user requirements and workflows.
    - Sherpa Plus – building on Sherpa Project to produce policy, advocacy and other support strategies and materials.
    - SPECTRa: Submission, Preservation and Exposure of Chemistry Teaching and Research Data – open access to experimental data via institutional repositories.
    - StORe: Source-to-Output Repositories – also looking at address the area of interactions between output repositories of research publications and source repositories of primary

research data (but across various subject areas).

- IRRA: Institutional Repositories and Research Assessment -- developing practical solutions for integrating DSpace and EPrints repositories and repository workflows into RAE activities.

Russell Group Statement on Scholarly Communication and Publishing

52. The Russell Group of universities (of which Oxford is one) published a statement on scholarly communication and publishing in June 2005, in association with the Joint CURL/SCONUL Scholarly Communications Group. The statement expresses support for the principle that publicly-funded research should be publicly available and that the current system of scholarly publishing does not always work in the best interests of the research community. Therefore, the Russell Group support the development of institutional repositories of research papers, and will actively encourage their researchers to deposit their work in them. The statement also calls for further research into the charging model for journal publishing and supports discussion of these issues within UUK, RCUK and institutions.

Scottish Declaration on Open Access

53. The Scottish Declaration on Open Access was launched in Oct 2004 and by Mar 2005 sixteen Scottish institutions had signed it.[44] [45] The Declaration notes that the current subscription-based scholarly journal system is no longer the most effective means of disseminating research results. The Declaration quotes the definition of open access from the Budapest Open Access Initiative and acknowledges the two routes to open access, by publication in an open access journal and by self-archiving in an institutional or subject-based repository. The signatories to the Declaration endorse the principle of open access and commit themselves to implementing a series of actions (depending on the role a signatory may have). The sixteen or more Scottish research institutions, for example, are now committed to (as quoted):

    - Set up institutional repositories, and/or liaise with other organisations to establish a joint repository.
    - Encourage, and where practical mandate, researchers to deposit copies of their outputs (articles, reports, conference papers, etc) in an institutional or co-operative repository.
    - Encourage, and where practical mandate, the deposit of PhD theses in an institutional repository.
    - Review intellectual property policies, to ensure that researchers have the right and duty to provide an open access version of their research.

International context

54. The publication of, and access to, research is of international concern, especially in an information age where geo-political boundaries are often irrelevant. There have been a number of international initiatives which have consolidated support for open access policies, including both institutional repositories and open access journals. The most notable are:

    - The **Berlin Declaration on Open Access to knowledge in the Sciences and Humanities** (Oct 2003)[46], to which signatories include the major German research organisations, Centre National de la Recherche Scientifique (CNRS, France), Fonds National de la Recherche Scientifique (FNRS, Belgium), Chinese Academy of Sciences, Indian National Science Academy, Sveriges Universitets & Högskoleförbund, CERN[47], and the *Joint Information Systems Committee* (JISC). The Berlin Declaration defines open access 'contributions' (whether scientific research results, raw data or metadata, digital representations, or scholarly multimedia) as allowing users a free, irrevocable global right of access to, and license to copy, use, distribute, [etc] the work publicly and make derivative works (whilst preserving proper

attribution of authorship). In addition, and perhaps more relevant to this discussion, is the condition that a complete version of the work and supplemental materials, be deposited in an online repository supported by an academic institution, society or agency that seeks to enable open access using appropriate technical standards, and long-term archiving. The signatories to the Berlin Declaration agree to encourage researchers to publish work according to the principles of open access (through, for example, recognising open access publication in promotion evaluation and encouraging software development, content provision, and publication).

- The **Budapest Open Access Initiative** (BOAI, Feb 2002)[48], whose signatures include 314 organisations (e.g. Association of College and Research Libraries, Association of Research Libraries, Australian Vice Chancellors Committee, BioMed Central Ltd, H-Net: Humanities and Social Sciences OnLine, *Oxford University Library Services*, Public Library of Science, and SPARC (Scholarly Publishing & Academic Resources Coalition) Europe). BOAI recognises that price barriers, in particular, limit access to scholarship. The Initiative calls for non-royalty bearing academic literature to be freely accessible online. BOAI notes that the cost of production of online peer-reviewed literature is lower than traditional forms of scholarly dissemination. Therefore, the Initiative recommends two complementary strategies: 1) self-archiving by authors in OAI-compliant repositories; 2) the launching of, and publication in, open access peer-reviewed journals. Either way, open access to peer-reviewed research is the goal endorsed by the signatories who, together with the Open Society Institute as founder organisation, agree to lend their effort and resources to attain this goal.

55. Other notable agreements include the **OECD Committee for Scientific and Technological Policy** declaration on access to research data from public funding (Jan 2004) whose signatures include the governments of the UK and United States;[49] and the **Bethesda Statement on Open Access Publishing** (to stimulate discussion within the biomedical research community)[50]. Elsewhere in Europe all Dutch universities and about 85% of German universities have established institutional repositories.[51] The **Scholarly Publishing and Academic Resources Coalition (SPARC)** has a European presence (hosted by OULS) and aims, amongst other things, to encourage the establishment of institutional repositories; support scholar-led publishing initiatives; and develop innovative digital publishing models for scholarship.[52]

Appendix A: Response from Oxford University to the RCUK position statement on dissemination of and access to research outputs [11 May 2005][53]

From the perspective of academic scholarship, the requirement to deposit research outputs in an electronic repository is a positive development that would greatly enhance public access to the results of academic research as well as encourage development of the University's nascent institutional repository. We are grateful for the chance to comment on RCUK's proposals and in general express our strong support. However, several concerns have been brought to light here during review of the new policy which we should like to bring to your attention. These cover a number of general and specific areas, as follows:

Costs

The costs of an institutional repository would grow substantially if the RCUK proposition were realized. The RCUK statement suggests that, whilst Research Councils are prepared to assist individual researchers meet the costs of putting their publications into an e-repository, there would be no such guaranteed funding to help institutions developing e-repositories meet the associated additional costs of managing these facilities. Could the additional expense for institutions be factored into RCUK's plans?

It would be helpful if RCUK's expectations about institutional versus individual responsibility could be clarified. If the Research Councils are expecting institutions to 'police' the system internally, there is a further potential cost in terms of the extra administrative burden associated with a requirement about institutional compliance: while the RCUK statement notes that depositing items in an e-repository is straightforward for individual academics, any extension of this grant condition to involve institutional responsibility would oblige universities – at some cost – to have to put in place systems to make sure that research council-funded outputs are, in fact, deposited, either by academics or administrators. This could result in a significant additional workload at institutional level. We wondered whether RCUK had considered this consequence or whether it had an expectation that compliance would be mandatory at an individual, but not institutional level.

Penalties

If RCUK's expectation is that the academic concerned is solely responsible for compliance (notwithstanding the fact that the grant is made to the institution), the position statement says nothing about the possible consequences of breaching the proposed grant condition. What would the sanctions be if a researcher failed to meet the requirement to deposit his or her work as stipulated in the policy? It would be helpful to clarify the potential penalties.

On a more general point, a fair level of knowledge about copyright and licensing issues will be required to ensure that individual academics do not inadvertently breach either the law or their grant requirement when depositing a research output in the institutional repository. Again, appropriate arrangements would need to be put in place at institutional level to make sure that the rules are made clear to all academics in receipt of research council grants so that they neither breach their grant requirement nor break the law, and perhaps to encourage them also not to surrender their copyright in the first place. The staffing arrangements for the institutional repository would need to include access to expertise to advise academics on copyright and licensing issues.

Development of institutional repositories

We feel that more could be said in the position paper about the importance of good practice in setting up institutional repositories, since their proper development and management will be an integral part of the potential success of RCUK's proposals. For example, it could usefully go into more detail about the importance of long-term preservation, which should be part of the

consideration when setting up repositories, and not necessarily an after-thought; the need to verify what is put on an institutional archive (in terms of identifying what has or has not been subject to peer review), to ensure the academic integrity of what is published there, and to ensure no IPR issues or disputes arise; and the future 'trackability' of electronic copies, if some are placed in institutional repositories and some in repositories of learned societies, without some form of accepted standard operational practice (so that they are cross-searchable, for example).

Other impacts

In introducing any new arrangements about deposit in institutional repositories, consideration should be paid to the implications for the financial well-being of those learned societies which are dependent on academic publication and which return some of the financial revenues earned to the benefit of the academic community.

In this context, we should like to emphasise the importance of developing and maintaining a mixed economy of systems for the provision of access to research results, in which institutional e-repositories and Open Access, as well as journals, all have a part to play.
We should also point out that, during our internal consultation on RCUK's position statement, we received feedback from Oxford University Press, which expressed a clear preference for the provision of Open Access over institutional repositories.
OUP is generally supportive of publicly-funded research results being made available under an open access model. However, if that approach were factored into RCUK's proposals for dissemination of Research Council-funded research results, we would wish to be assured that the costs of adopting it would be offset by Research Council funding.
In the event that Oxford University proceeds further with the development of its institutional repository, it would clearly wish to draw upon the technical expertise of OUP, along with other key parts of the University in this context.

Principle 3(c): we appreciate the intent of this paragraph, but the current wording seems to imply that cost-effectiveness has equal priority to freedom to publish. We would argue that the latter should be without constraint. This does not negate the separate question of the use of public funds: it is entirely appropriate for RCUK to seek to ensure that public funds are used only for cost-effective publication, but this should not prevent any author or university publishing in whatever way he/she (or it) sees fit, using other support. (This point is relevant also to Paragraph 27 of the policy document.)

Principle 18: whilst we agree very strongly with the principle of peer review, this statement could perhaps be tempered by reference to circumstances in which academic freedom is the greater priority. (Even though such circumstances do not prevail in the UK at present, peer review might conceivably be compromised where analyses and conclusions run contrary to established wisdom, for example.)

Appendix B: Digital Archiving of Research at the University of Oxford Workshop Programme

Date: 10 June 2005
Time: 9.30 Panel followed by one-day workshop
Location: Seminar Room, Oxford Internet Institute, 1 St Giles, Oxford

Schedule
0900 OII Opens, Coffee Available

0915 **Welcome and Overview**
Bill Dutton, OII, ICTC and Digital Archiving Group; Dave Price, OULS and Michael Fraser, Research Technologies Service, OUCS

0930 **Panel: Digital Archiving and Institutional Repositories: Technical, Social, Legal and Institutional Perspectives**
Chair: Paul Jeffreys, Director OUCS

Panellists:
Christine Borgman, Visiting Academic, OII and Presidential Chair in Information Studies, UCLA

David Prosser, Director, SPARC Europe

Anne Trefethen, Deputy Director of the UK e-Science Core Programme and Executive Director of the Oxford Interdisciplinary e-Research Centre (IeRC)

Martin Richardson, Managing Director, Journals Division, Oxford University Press

David Vaver, Director of the Oxford Intellectual Property Research Centre at St Peter's College, Oxford

Yorick Wilks, Professor in the Department of Computer Science, University of Sheffield and Visiting Academic, OII

1100 Coffee

1115 **Roundtable Discussion: Policies, infrastructures and Resources for an Oxford Research Repository**

1230
Chair: Judy Palmer, Keeper of Scientific Papers, RSL & Chair, Electronic Resources Committee

Lunch: Meeting Room, 1 St Giles

1330 **The Way Forward for Oxford University: Discussion of Briefing Document**
Chair: Dave Price, Head of the Systems and Electronic Resources Service, University of Oxford

Opening Speakers:
Heather Weaver, E-Information, Business and Information Technology Department, CCLRC Rutherford Appleton Laboratory

Pauline Simpson, Head of Information Services, National Oceanography Centre, Southampton and Project Manager, TARDis Project

1600 Workshop Concludes

Appendix C: Eprints, Open Access, Institutional Repositories : Further Reading (June 2005)

Articles, presentations and reports

Barton, Mary R. *Creating an Institutional Repository: LEADIRS Workbook*. MIT Libraries, 2004. http://www.dspace.org/implement/leadirs.pdf

Bailey, Charles W. *Open Access Bibliography: Liberating Scholarly Literature with E-Prints and Open Access Journals.* Association of Research Libraries, 2005. http://info.lib.uh.edu/cwb/oab.pdf

Carr, L. and S. Harnad. "Keystroke economy: A study of the time and effort involved in self-archiving". (public draft, 2005), http://eprints.ecs.soton.ac.uk/10688/

Day, Michael. "Institutional repositories and research assessment". ePrints UK Supporting Study 4 (draft, Dec 2004). http://www.rdn.ac.uk/projects/eprints-uk/docs/studies/rae/rae-study.pdf

Electronic Publishing Services Ltd. *ELISO: an electronic library and information service for the University of Oxford.* Mar, 2005. http://www.admin.ox.ac.uk/lib/oxonly/eliso/eliso.shtml

Foster, Nancy Fried and Susan Gibbons. "Understanding Faculty to Improve Content Recruitment for Institutional Repositories". *D-Lib Magazine* 11:1 (Jan 2005), http://www.dlib.org/dlib/january05/foster/01foster.html

Goldstein, Stéphane. "Publication of and access to UK research outputs: emerging RCUK views", http://www.stm-assoc.org/conferences/Goldstein.ppt

Harnad, Steven and Tim Brody. "Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals". *D-Lib Magazine* 10:6 (2004), http://www.dlib.org/dlib/june04/harnad/06harnad.html.

Hey, Jessie M N. "Targeting Academic Research with Southampton's Institutional Repository" *Ariadne* 40 (July-2004), http://www.ariadne.ac.uk/issue40/hey/intro.html

Hey, Jessie M.N. *An environmental assessment of research publication activity and related factors impacting the development of an Institutional e-Print Repository at the University of Southampton*. (TARDis Project Report, D 3.1.2), 2004. http://eprints.soton.ac.uk/6218/

House of Commons Science and Technology Committee. *Scientific Publications: Free for All?* London: Science and Technology Committee, House of Commons, United Kingdom Parliament, 2004. http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39902.htm

Lynch, Clifford. "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age". *ARL Bimonthly Report* 226 (February 2003), http://www.arl.org/newsltr/226/ir.html

Knight, Gareth. "Report on a deposit licence for E-prints" Arts and Humanities Data Service (AHDS), 2004. http://ahds.ac.uk/about/projects/sherpa/report.htm

Mackie, Morag. "Filling Institutional Repositories: Practical strategies from the DAEDALUS Project". *Ariadne* 39 (April 2004), http://www.ariadne.ac.uk/issue39/mackie/

Murray-Rust, Peter. "Open Data!" JISC Annual Conference, April 2005, http://www.dspace.cam.ac.uk/handle/1810/31316

Ober, John L. *Postprint Repository Services: Context and Feasibility at the University of California*. Office of Scholarly Communication, University of California, Mar 2005. http://osc.universityofcalifornia.edu/responses/materials/UC_postprintstudy_final.pdf

Pinfield, Stephen. "A mandate to self archive? The role of open access institutional repositories". *Serials* 18:1 (2005), 30-34. http://eprints.nottingham.ac.uk/archive/00000152/

Prosser, David. "Information Revolution: Can Institutional Repositories and Open Access Transform Scholarly Communications?" *ELSO Gazette* 15 (Jul 2003). http://www.the-elso-gazette.org/magazines/issue15/features/features1.pdf

Rowlands I, Nicholas D, and P. Huntington. *Scholarly communication in the digital environment: what do authors want? Findings of an international survey of author opinion*. London: City University, 2004: http://ciber.soi.city.ac.uk/

Simpson, Pauline and Jessie Hey. "Forward in time: TARDis and the RAE". *JISC Inform*, No. 8 (2005): 16. http://eprints.soton.ac.uk/14522/

Suber, Peter. "Open Access News: News from the open access movement", http://www.earlham.edu/~peters/fos/fosblog.html

Sytsema, Johanneke. "SHERPA and OUP: an odd couple?", http://www.ouls.ox.ac.uk/erc/sherpa0406.ppt

Unsworth, John M. "The Next Wave: Liberation Technology". *The Chronicle of Higher Education* 50:21 (January 30, 2004). http://www.iath.virginia.edu/~jmu2m/liberation.html

Policies

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html

Bethesda Statement on Open Access Publishing, http://www.earlham.edu/~peters/fos/bethesda.htm

Budapest Open Access Initiative, http://www.soros.org/openaccess/read.shtml

CERN Open Access Policy, http://doc.cern.ch/archive/electronic/cern/preprints/open/open-2005-006.pdf

Kansas University Resolution on Access to Scholarly Information, http://www.provost.ku.edu/policy/scholarly_information/scholarly_resolution.htm

OECD Committee for Scientific and Technological Policy at Ministerial Level Declaration on Access to Research Data from Public Funding, http://www.oecd.org/document/0,2340,en_2649_34487_25998799_1_1_1_1,00.html

Publisher copyright policies & self-archiving, http://www.sherpa.ac.uk/romeo.php

Registry of Institutional OA Self-Archiving Policies, http://www.eprints.org/signup/fulllist.php

Scottish Declaration on Open Access. (Oct 2004), http://scurl.ac.uk/WG/OATS/declaration.htm

Southampton Electronic & Computer Science Department Research Self-Archiving Policy, http://www.ecs.soton.ac.uk/~lac/archpol.html

SPARC Europe: Scholarly Publishing and Academic Resources Coalition in Europe, http://www.sparceurope.org

TARDIS: Targeting Academic Research for Deposit and Disclosure, http://tardis.eprints.org/

Wellcome Trust Position Statement in Support of Open Access Publishing, http://www.wellcome.ac.uk/doc_WTD002766.html

Repositories and search services (sample)

Institutional

Institutional Archives Registry, http://archives.eprints.org/eprints.php

Sherpa, http://www.sherpa.ac.uk/

Cambridge: DSpace@Cambridge, http://www.dspace.cam.ac.uk/

Glasgow ePrints Service, http://eprints.gla.ac.uk/

Oxford University pilot eprints repository, http://eprints.ouls.ox.ac.uk/

Southampton: e-Prints Soton, http://eprints.soton.ac.uk/

UCL Eprints, http://eprints.ucl.ac.uk/

Subject

ArXiv, http://xxx.arxiv.cornell.edu/ (physics, mathematics, non-linear science and computer science)

Cogprints, http://cogprints.ecs.soton.ac.uk/ (Cognitive sciences including psychology, neuroscience, linguistics and other related areas)

CiteSeer, http://citeseer.nj.nec.com/cs (computer science)

E-LIS, http://eprints.rclis.org/ (library and information science)

HTP Prints, http://htpprints.yorku.ca/ (History and theory of psychology)

PubMedCentral, http://www.pubmedcentral.nih.gov/ (US National Library of Medicine's digital archive of life sciences journal literature.

PhilSci Archive, http://philsci-archive.pitt.edu/ (philosophy of science)

RePEc, http://repec.org/ (research papers in economics)

Search

Citebase Search [citation ranking], http://citebase.eprints.org/help/

CiteSeer.IST: Scientific Literature Digital Library, http://citeseer.ist.psu.edu/

e-Prints-UK, http://eprints-uk.rdn.ac.uk/

OAIster, http://oaister.umdl.umich.edu/o/oaister/

Software and Standards

Open Society Institute. *A Guide to Institutional Repository Software v 3.0* (Aug 2005), http://www.soros.org/openaccess/software/

Creative Commons licence, http://creativecommons.org/

Dspace, http://www.dspace.org/

Fedora, http://www.fedora.info/

GNU Eprints, http://software.eprints.org/

Open Archives Initiative, http://www.openarchives.org/

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2 This observation was made during the roundtable discussion at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005.
3 This is a particular concern of the OUCS Learning Technologies Group, especially expressed through the desired outcomes from the ASK Project.
4 David Wallom, "OxGrid, A campus Grid for the University of Oxford.". ICT Seminar Series, 18 Jan 2006. Yorick Wilks (presentation at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005) also made the point that increasingly it will be machines trawling repositories, processing the data and creating new information (e.g. Within framework of the Semantic Web).
5 Reading University uses its Information Strategy Committee as a forum to discuss these issues. The University of California established an Office of Scholarly Communication to ensure a coherent approach across its campuses.
6 This paragraph is derived from Christine Borgman's presentation at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005.
7 This paragraph is derived from Anne Trefethen's presentation at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005.
8 On the evidence for impact of open access articles see, Harnad, Steven and Tim Brody. "Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals". *D-Lib Magazine* 10:6 (2004), http://www.dlib.org/dlib/june04/harnad/06harnad.html.
9 Pinfield, Stephen. "A mandate to self archive? The role of open access institutional repositories". *Serials* 18:1 (2005), 30-34. http://eprints.nottingham.ac.uk/archive/00000152/
10 See further the database, "Publisher copyright policies & self-archiving", http://www.sherpa.ac.uk/romeo.php
11 Carr, L. and Harnad, S. "Keystroke Economy: A Study of the Time and Effort Involved in Self-Archiving." (2005): http://eprints.ecs.soton.ac.uk/10688/.
12 OAIster, http://oaister.umdl.umich.edu/o/oaister/
13 This paragraph is derived from David Vaver's presentation at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005. The University of California Office of Scholarly Communication has produced guidelines for the academic management of IPR, http://osc.universityofcalifornia.edu/manage/.
14 This paragraph is derived from David Prosser's presentation to the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005. A recent (May 2005) study of research authors found that, "The vast majority of authors (81%) responded that they would willingly comply with a mandate from their employer or research funder to deposit copies of their articles in an institutional or subject-based repository. " (Swan, A. and Brown, S. *Open access self-archiving: An author study*. (Key Perspectives Inc., 2005): http://eprints.ecs.soton.ac.uk/10999/.)
15 ICT Strategy Programme, http://www.ict.ox.ac.uk/strategy/.
16 VTLS Vital, http://www.vtls.com/Products/vital.shtml.
17 ASK Project, http://ask.oucs.ox.ac.uk/.
18 DART-Europe, http://www.dartington.ac.uk/dart/.
19 RIVER Project (Oxford site), http://ask.oucs.ox.ac.uk/ask/index.php/Version_control.
20 This paragraph is derived from Martin Richardson's presentation at the 'Digital Archiving of Research at the University of Oxford' workshop, 10 June 2005.
21 Sytsema, Johanneke. "SHERPA and OUP: an odd couple?", http://www.ouls.ox.ac.uk/erc/sherpa0406.ppt
22 Eprints-UK Project, http://www.rdn.ac.uk/projects/eprints-uk/
23 Oxford Virtual Research Environment projects, http://www.vre.ox.ac.uk/.
24 A research discovery service, http://acdt.oucs.ox.ac.uk/acdt/projects/detail.php?proj_id=2004d
25 ELISO: an electronic library and information service for the University of Oxford http://www.admin.ox.ac.uk/lib/oxonly/eliso/eliso.shtml
26 JISC Focus on Access to Institutional Resources (FAIR) Programme, http://www.jisc.ac.uk/index.cfm?name=programme_fair and also the recent JISC briefing paper on open access, http://www.jisc.ac.uk/index.cfm?name=pub_openaccess (April 2005).
27 Wellcome Trust Position Statement in Support of Open Access Publishing, http://www.wellcome.ac.uk/doc_WTD002766.html
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29 "RCUK Position Statement on Access to Research Outputs", http://www.rcuk.ac.uk/access/index.asp. See also, Stéphane Goldstein, "Publication of and access to UK research outputs: emerging RCUK views", http://www.stm-assoc.org/conferences/Goldstein.ppt
30 Free for all? House of Commons Science and Technology Committee inquiry into Scientific Publications http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39902.htm
31 See the transcripts of oral and written evidence at http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39902.htm#evidence.
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37 Simpson, Pauline and Jessie Hey. "Forward in time: TARDis and the RAE". *JISC Inform*, No. 8 (2005): 16. http://eprints.soton.ac.uk/14522/
38 Registry of Institutional OA Self-Archiving Policies, http://www.eprints.org/signup/fulllist.php. A sample departmental research self-archiving policy is also available in the *Open Society Institute Eprints Handbook* (2005), http://www.eprints.org/documentation/handbook/departments.php.
39 Sherpa, http://www.sherpa.ac.uk/
40 See for example, Knight, Gareth. "Report on a deposit licence for E-prints" Arts and Humanities Data Service (AHDS), 2004. http://ahds.ac.uk/about/projects/sherpa/report.htm (on behalf of Sherpa)
41 Distribution of UK Higher Education Repositories, http://www.sherpa.ac.uk/documents/rep_distrib.html
42 e-Prints-UK, http://eprints-uk.rdn.ac.uk/
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