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It is the paper published as:

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Title: Learning to Share: Mandates and Open Access

Journal: Library Management

ISSN: 0143-5124

Year: 2011 **Volume:** 32 **Issue:** 4-May **Pages:** 302-318

Abstract: PurposeOnline open access (OA) to research publications comes to scholarship as a vision that makes sense and is congruent with the aims of science and scholarship. It is argued that research, often funded out of the public purse, should be a public good. Given its visionary characteristics and its congruence with the aims of scholarship, this paper examines why OA is not practiced by all researchers, all the time, or more encouraged by library managers?MethodologyThe findings reported in the paper are built upon analyses of the literature, the current discussion occurring in e-lists and other public forums, and upon qualitative research using observation, document analysis, interview techniques and thematic analysis conducted as part of a PhD study in two Australian universities.FindingsOne of the universities had a long-standing institutional mandate to encourage open access and the other did not. In terms findings, of the universities studied, the institution with the mandate, not only had a far greater proportion of its research output in its open access institutional repository but also the researchers and authors interviewed there had a deep understanding of, and engagement with, issues surrounding not just scholarly publishing but also OA and other publishing options. Further, OA and the mandate policy were reported by university executives as providing benefits both to individual researchers and to the institution as a whole.Originality/ValueIn analyzing the relationships and entanglements that exist between authors, universities, publishers and other actors we see how these reinforce the current publishing paradigm. While proposals for mandates are not new, this paper illustrates how one is acting in practice. It proposes that despite reservations among academic library managers a mandate can work in practice. Sometimes, a new actor, such as a mandate or deposit policy is required, to assist library and repository managers, to encourage authors to look beyond their existing frames and embrace open access.

URL:

<http://www.emeraldinsight.com/fwd.htm?id=aob&ini=aob&doi=10.1108/01435121111132301>,
http://researchoutput.csu.edu.au/R/-?func=dbin-jump-full&object_id=25777&local_base=GEN01-CSU01,

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CRO Number: 25777

LEARNING TO SHARE: MANDATES AND OPEN ACCESS

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ABSTRACT

Purpose

Online open access (OA) to research publications comes to scholarship as a vision that makes sense and is congruent with the aims of science and scholarship. It is argued that research, often funded out of the public purse, should be a public good. Given its visionary characteristics and its congruence with the aims of scholarship, this paper examines why OA is not practiced by all researchers, all the time, or more encouraged by library managers?

Methodology

The findings reported in the paper are built upon analyses of the literature, the current discussion occurring in e-lists and other public forums, and upon qualitative research using observation, document analysis, interview techniques and thematic analysis conducted as part of a PhD study in two Australian universities.

Findings

One of the universities had a long-standing institutional mandate to encourage open access and the other did not. In terms findings, of the universities studied, the institution with the mandate, not only had a far greater proportion of its research output in its open access institutional repository but also the researchers and authors interviewed there had a deep understanding of, and engagement with, issues surrounding not just scholarly publishing but also OA and other publishing options. Further, OA and the mandate policy were reported by university executives as providing benefits both to individual researchers and to the institution as a whole.

Originality/Value

In analyzing the relationships and entanglements that exist between authors, universities, publishers and other actors we see how these reinforce the current publishing paradigm. While proposals for mandates are not new, this paper illustrates how one is acting in practice. It proposes that despite reservations among academic library managers a mandate can work in practice. Sometimes, a new actor, such as a mandate or deposit policy is required, to assist library and repository managers, to encourage authors to look beyond their existing frames and embrace open access.

Keywords: Institutional repositories, open access, mandates, academic libraries

Paper type: Research paper

INTRODUCTION

An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the Internet (Budapest Open Access Initiative).

The statement above is a vision, written by open access (OA) activists to encourage scholarly authors to amend their publishing practice to enable the free distribution over the Internet of the research output usually published in peer-reviewed journals and conferences. For the purposes of this paper, one of many widely accepted definitions of, OA (Drott 2006) is adopted. This definition refers to work that is freely available to users via the Internet without financial cost or

legal or technical barriers. Users can freely “read, download, copy, distribute, print, search or link to” (Budapest Open Access Initiative, 2002) the full text of OA works, although it is expected that they will respect the integrity of authors work and that authors rights will be correctly acknowledged and cited. Why should we expect authors to make their work OA? There is the altruistic vision espoused in the above definition of OA by the Budapest Open Access Initiative (BOAI) and others, but also there are arguments that increased access to their research output may potentially increase the use of the work, its visibility, and therefore its impact and citations (Brody et al., 2006, Swan, 2010).

Willinsky (2006) posits ten “flavours” of OA, based largely on how the particular flavour of OA is financed and dependent on the nature of the access provided. Some of the flavours contravene the most open of OA definitions, but they all increase access over the previously existing “toll access” subscription models of scholarly publishing. This paper focuses on one specific flavour, OA repositories, known as the “green road” to OA and which utilise free open source or even proprietary software (Harnad et al., 2004, Swan et al., 2005). OA repositories are a legal and powerful way to provide OA to the scholarly corpus.

Repositories are combinations of software and hardware that together provide a set of services than manage and disseminate digital works (Lynch, 2003, Jantz and Wilson, 2008) and in which authors are encouraged to deposit copies of their own work. The term commonly used for depositing ones work is to “self archive” (University of Southampton, Undated, Xia and Sun, 2007, Oxford University Press, 1989). Research output (journal articles, conference papers etc.) can be self archived¹ at either the pre or post peer review stage. These works are generally works that scholars give away without expectation of payment, for example versions of papers published in traditional peer reviewed journals or conference proceedings (Suber, 2003). Green OA operates in conjunction with traditional scholarly publishing. Its focus is to provide access, not to provide all the functions provided by a journal. OA repository content exists to provide access for those who do not have access to the journal and to provide additional visibility of the work through search engines such as Google and Google Scholar. Repositories rely on journals for registration and certification. The two systems, green OA and traditional publishing, at this point in time, require coexistence.

Repositories come in two main types, institutional and disciplinary. There are many disciplinary repositories, some of which are very successful in covering, preserving and making accessible the literature of their discipline. Many of these repositories began their lives as pre-print archives². These have been developed mainly in fields where time to publication in journals was long, such as economics; or in fields where time to publication was important; or in fields which already had a culture of distributing preprints in paper in pre-Internet times, such as physics and

¹ The term self-archiving is in common use in the OA movement where it refers to the practice of researchers depositing their works online in OA repositories as mentioned above. This is a variation on usual definition of archiving; in the more traditional sense an archive is either a place in which public or historic records or documents are stored; or in computing where archiving refers to storing infrequently used files. Further, the “self” in self-archiving can be a misnomer as self-archiving can be performed not just by authors, but by administrative or library staff or other “proxies”, or even by harvesting researcher web sites.

² In the paper paradigm when a journal published an author's work, the author was able to obtain copies of reprints (copies of the refereed, published work) from the publisher which could be sent to colleagues or which interested parties could request. The reprint is now usually in electronic format and has come to be known as the e-print. However e-prints can be both pre-prints (pre-peer review) and post-prints (post-peer review) Post-prints are all post publication works including the official published version, although what is self-archived is usually the final author's version of the post-peer reviewed paper (Harnad, 2003).

finance. Pre-prints are usually un-refereed drafts (Borgman, 2007, Harnad, 2003). Many disciplines or fields within disciplines (Jamali and Nicholas, 2009) are not in a position to set up such repositories. They may not have the technical expertise, funds, coherence, established preprint culture or desire to invest in such infrastructure. Enter the institutional repository (IR), the focus of this study.

Why focus on IR? It is argued that institutions such as universities are the appropriate places to establish repositories, as it is increasingly important for universities to document and share their scholarship, and because IR provide an effective platform for scholarly communication. Universities have staff skilled in information management in their libraries and IT departments, and they have the resources and infrastructure to set up, support and fund repositories. They can mandate or encourage self archiving and they can benefit from the enhanced profile (Cochrane and Callan, 2007, Horwood et al., 2003, Lynch and Lippincott, 2005, Pinfield, 2005, Crow, 2002). IR further benefit universities, and other research institutions, by acting as a storage and retrieval space and potentially creating preservation and curation tools for research output (Poynder, 2005) in addition to providing a showcase for their research. In the words of Lynch (in Lynch and Lippincott, 2005):

A university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organisational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organisation and access or distribution.

In the past, researchers have had a symbiotic relationship with commercial and learned society publishers to achieve the dissemination of their research. However, for commercial publishers, profit from the sales of subscriptions to libraries, aggregators and individuals is a key driver, and for learned society publishers the sale of publications form a significant part of income which is used to subsidise their other activities (Goodman, 2004, Look, 2004, Poynder, 2005, Poynder, 2004). Thus, at the outset we have a tension between the aims of two core groups of actors, authors and publishers, in scholarly publishing; one group interested in maximising access and readership, and the other in maximising sales. **However, this is not a case of a clear two groups in conflict with each other.** Authors also work with and for publishers, acting as editors, reviewers, advisors, authors and furthermore they gain kudos from these roles. Authors, even those enrolled by a vision of open access, thus inhabit a complex world of related and interconnected networks or regions with unclear boundaries between their various roles.

Publishers too, inhabit a complex world. Some embrace open access, and indeed there are many open access journal publishers³. However, others do not welcome OA. In 2007 some scientific, technical and medical (STM) publishers forged an alliance called PRISM⁴ (Partnership for Research Integrity in Science and Medicine) to work against OA, particularly OA mandates (Giles, 2007; Van Orsdel & Born, 2008). Several influential publishers distanced themselves from this alliance. Indeed, many publishers have amended their copyright agreements with authors to enable authors to self-archive versions of their work. SHERPA RoMEO⁵ is a service

³ See, for example the Directory of Open Access journals (DOAJ) at <http://www.doaj.org>.

⁴ <http://www.prismcoalition.org/>

⁵ <http://www.sherpa.ac.uk/romeo/>

which categorises publishers' conditions for authors regarding self-archiving into four categories, from "green" representing a publisher which allows self-archiving of both pre-prints and post-prints, to "white" representing a publisher which forbids self-archiving. As early as 2006 Willinsky, as mentioned earlier, posited ten flavours of OA, several of which have been driven by publishers. For example: author fee OA (publishers charge the authors rather than the readers), subsidized OA (where journals are subsidised by societies, institutions, government agencies or foundations, for example, and charge neither authors nor readers), dual mode OA (publishers charge for the print edition, and provide free electronic versions), delayed OA (publishers sell subscriptions to print and electronic versions but offer OA after a period of time, typically six or twelve months), partial OA (journals make a small number of articles OA in each edition), and *per capita* OA (publishers provide access to researchers in developing countries through programs such as the World Health Organisation's HINARI project). While some of these contravene the most open of OA definitions, they all use technology to increase access over the previously existing models of scholarly publishing and represent publishers' recognition of the importance of OA, and their willingness to experiment. Morris from the Association of Learned and Professional Society Publishers (ALPSP) counsels, change is inevitable and resistance to change is futile. Repositories and OA are only the beginning of potential changes to scholarly publishing enabled by technologies. It is vital, in her mind, for publishers to seek understanding and collaborations to find a way forward for themselves in the future (Morris, 2007).

The vision of a freely available scholarly corpus has led to the increasing proliferation of institutional repositories. However, OA content in the repositories is not increasing at the same rate. Adoption of the vision and the technology is slow, not among the institutions developing them, but slow to gain traction with academics. (Thomas and McDonald, 2007, Björk et al., 2008) However, the more of that scholarly corpus available in individual repositories, the more the vision of open access *for the sake of inquiry and knowledge* is possible. The reasons researchers are so loathe to deposit their work in repositories have prompted a plethora of studies. Most of them are based on surveys, some on interviews, some analysing repository content. (Swan and Brown, 2005, Swan and Brown, 1999, Houghton et al., 2004, Houghton et al., 2003, Nicholas et al., 2006, Hess et al., 2007, Mann et al., 2008, Kennan, 2007, Markey et al., 2007, Jantz and Wilson, 2008) Others examine at the issue of how to ensure academics participate in self-archiving (Xia, 2007, Foster and Gibbons, 2005). This paper looks at IR specifically as repositories for a university's research output with the aim of increasing access to and use of that research and as a tool for preserving and curating that research. It investigates in-depth two academic communities and their repositories, one of which had a deposit mandate, the other which did not. It examines the role of the mandate and demonstrates how a mandate, along side other programs, can act to improve self-archiving rates, to bring about more open access which enables institutions to make available *the fruits of their research ... for the sake of inquiry and knowledge* (Budapest Open Access Initiative, 2002). The next section of this paper briefly describes the research method, and is followed by a discussion of the results. What emerges is an understanding of the role programs for and against OA IR (and specifically mandates) and how they may influence researchers to share their research output.

METHODS

The findings reported in the paper are built upon analyses of the literature, the current discussion occurring in e-lists and other public forums, and upon qualitative research using observation, document analysis and interview techniques conducted as part of a PhD study in two Australian universities. The first university (University A in a state capital city with about 40,000 students) was purposefully selected as it was in the process of implementing an IR

(2004 to 2007) and allowed the researcher access. As the implementation very slowly progressed, and many potential interviewees were not aware of the IR or indeed OA, the researcher sought another and was fortunate to find University B. University B is another large university with a similar number of students in a different capital city. University B had implemented a repository in 2003, and therefore had had a large number of academics familiar with it.

Thus the research reported in this paper is based upon a field study focussing on "contemporary phenomenon within [its own] real-life context". (Yin, 2003) This research is seeking a rich, deep understanding of the heterogeneous networks of scholarly publishing, OA and IR. The empirical material used to illuminate the research questions is largely of a qualitative nature. This empirical material was collected in a number of ways, from system planning and implementation documentation, emails, observation and minutes of meetings, IR technology documents, and from semi-structured interviews with both implementers and researchers, and observation of the environment and capture of information distributed regarding the implementations to potential users and managers. The repositories of the two institutions were interrogated, as were repositories beyond the two cases. Discussions and research were followed in the literature, and on e-lists and the web.

The interviewees do not constitute a representative sample of academics, disciplines or decision makers regarding publishing choices and OA; rather they present and discuss different views and actions that help illustrate the range and variability of attitudes and behaviours in the networks under study. Theoretical sampling of a purposeful nature was appropriate.(Eisenhardt, 1989) At University A 13 interviews were conducted with eight implementers, librarians and policy makers, and 18 interviews were conducted with researchers from a variety of disciplines (Economics (1), Finance (2), Information Systems (2), Science (4), Social Science (2), Engineering (3), Humanities (3), Information Science (1)). At University B seven interviews were conducted with 5 implementers, librarians and policy makers and 13 interviews with researchers from a variety of disciplines (Business (1), Science (1), Economics (1), Education (2), Law (3), Mathematics (1), Information Management (1), Design (1), Peace and Conflict Studies (1), Avionics (1)). At University A open meetings on research were attended and implementation documentation made available. For both universities, journal, university, funder and government policies were read and analysed, and the IR, The Internet, and journals publishing the work of scholars from these institutions were regularly interrogated.

Because scholarly publishing is complex and scholars from different disciplines, different societies, different parts of the world, and different types of institution, this research does not deal with a single disciplinary type or a scholarly archetype, but with actors who have partial connections through their institution, their country, their repository. So we accept this multiplicity and complexity and aim our study at the places where these things come together.(Mol and Law, 2002)

A thematic approach was used to analyse the empirical material. The aim was to identify themes within the data inductively. Themes that arose were sorted and re-sorted as the analysis progressed(Ezzy, 2002). We did not predetermine themes or categories prior to the analysis.

All research projects have limitations. This work is no exception. For example, of the human actors were only interviewed once or twice. Their views are thus represented for a particular point in time, a snapshot. Scholarly publishing, OA and IR are ongoing projects and actors'

views may change, indeed may have changed since interviews, observations and analysis were conducted. Further, while the field study on which this paper is based is not empirically generalisable in the traditional sense, it is a description and explanation of what has happened in two institutions implementing OA IR. It is instructive beyond the specific research sites as what has happened here may sensitise the readers (librarians, university decision makers, academic authors) to events and situations elsewhere and thereby enable the sharing of the experiences gained at the field study sites for learning for researchers, other repository implementers, and university administrators.(Mol and Law, 2002)

RESULTS

This paper refers to the OA IR implementation as the “the program”, in that the IR is the program that the universities studied are aiming to implement. OA activists often developed the initial and underlying software platforms to promote OA. Congruent with the aims of OA, these were often open source or free. The artefact of the IR is developed to work with a multitude of other technologies. As the software is introduced in institutions it goes to work with and for researchers, accepting papers, disseminating them through the Internet and search engines, providing feedback to implementers and researchers. University B was actively aiming to achieve an OA IR, University A provided mixed messages about its OA aims, initially insisting it was only targeting grey literature and theses for its IR, only later looking more openly at green OA. There are many barriers to these IR programs. We term these anti-programs as they are constantly evolving and adapting (Akrich and Latour, 1992, Latour and Woolgar, 1986), they are not fixed things, like barriers on a road.

Academic researchers have for a long time been enrolled in the traditional scholarly publishing network and learned to adopt and enact a particular set of practices that are associated with it. Many of these practices are entrenched and act as anti-programs to any change such as the implementation of an IR. Further, each university had programs and anti-programs working for and against their IR and OA, in some cases they were the same, and in some cases they were different.

University A was implementing the IR through the library which established a project team to develop the technology of the IR, and to promote the IR to the university staff. The University Librarian promoted the repository in places such as Academic Board. The University was supported by the government which supported, financially and in other ways, repository development and implementation, and by a consortium with other universities, which did the same. The Australian Government's Research Quality Framework (RQF) (Australian Department of Education Science and Training. Development Advisory Group of the RQF, 2006) a proposed research evaluation program since replaced by Excellence in Research, Australia (ERA)(Australian Government Australian Research Council, 2008), encouraged researchers to explicitly think about their publishing and funded academic libraries to develop institutional repositories. In each university the academic researchers were already writing papers and active in scholarly publishing. Many publishers have policies enabling authors to submit their papers, either as pre-or post-prints to an IR. Each academic belonged to disciplinary networks, many of which were discussing OA in their journals and newsletters, and some were thus familiar with the OA vision. Several disciplines used established disciplinary repositories, notably physics, economics, and the business based social science disciplines.

However, as the research progressed we found that for each actor, or group of actors, working with the program, there were actors, sometimes the same actors, with an anti-program. For example the government department that funded the research and development of IR and made

many statements about the value and importance of OA (Australian Department of Education Science and Training, n.d., Australian Department of Innovation Industry Science and Research, 2008) at the same time established anti-programs by only rewarding research published in the traditional manner such as in journals (Australian Government Australian Research Council, 2008) (Australian Department of Education Science and Training. Development Advisory Group of the RQF, 2006), including journals that do not support OA. Researchers were not to be rewarded for placing their work in repositories or making it OA in other ways.

Further, University A, even while implementing the OA IR also had anti-programs operating against OA. The IR existed as a project "under development" for more than three years so authors placing their work in it were uncertain about its stability or longevity; it was not advertised widely; it was not opened to search engines until very late in its development; initially it did not support OA for anything except grey literature and theses; and for some time the implementers sent mixed messages about the purpose of the repository.

We never went looking for preprints and post-prints of already published articles as a way to build the repository...if the published version wasn't freely available on the web, it was still accessible to our community, and if they had published it then it was more than likely in a journal which we took. So we took the line that why would we spend a lot of time and effort in a sense republishing things that have already been published?
[University A Librarian]

The OA vision was only promoted when it did not disrupt the existing scholarly publishing system:

... there are all sorts of information, resources and assets tied up in universities that don't their way to commercial publication, will never find their way to commercial publication. We have looked after them in their print versions, working papers, technical papers, so there is an immense amount of good useful stuff. And it seems to me that the stewardship we had applied to knowledge output that was in print that universities generated ... that we try and do it for digital outputs ... And I've always been a little bit worried that the preprints and post prints gets you into a republishing role. Managing the metadata about that is one thing but actually managing another digital version of something where the authoritative version is actually sitting inside a commercial journal is something that I still haven't come to terms with and I have not wanted to commit resources to [University A Librarian].

These acted as disincentives for researchers placing their papers in the IR. For example, why do the keystrokes to self archive, if there is no certainty that the IR will exist in the future, or if it wasn't actually going to increase visibility? The copyright agreements authors sign with publishers were perceived by authors to be an anti-program, and rather than dispelling this notion, or working with authors to explain it, University A added their own complex copyright statement in the deposit form for the repository, strengthening the copyright "anti-program". Finally, only a relative small proportion of the university's research output was going into the repository, with the exception of PhD's and Masters by Research theses. Theses are always deposited, as it is mandated that students do so prior to graduation. Figure 1 illustrates examples of the programs and anti programs that operated within University A during its IR implementation. It is interesting to note that that there are as many anti-programs as there are programs.

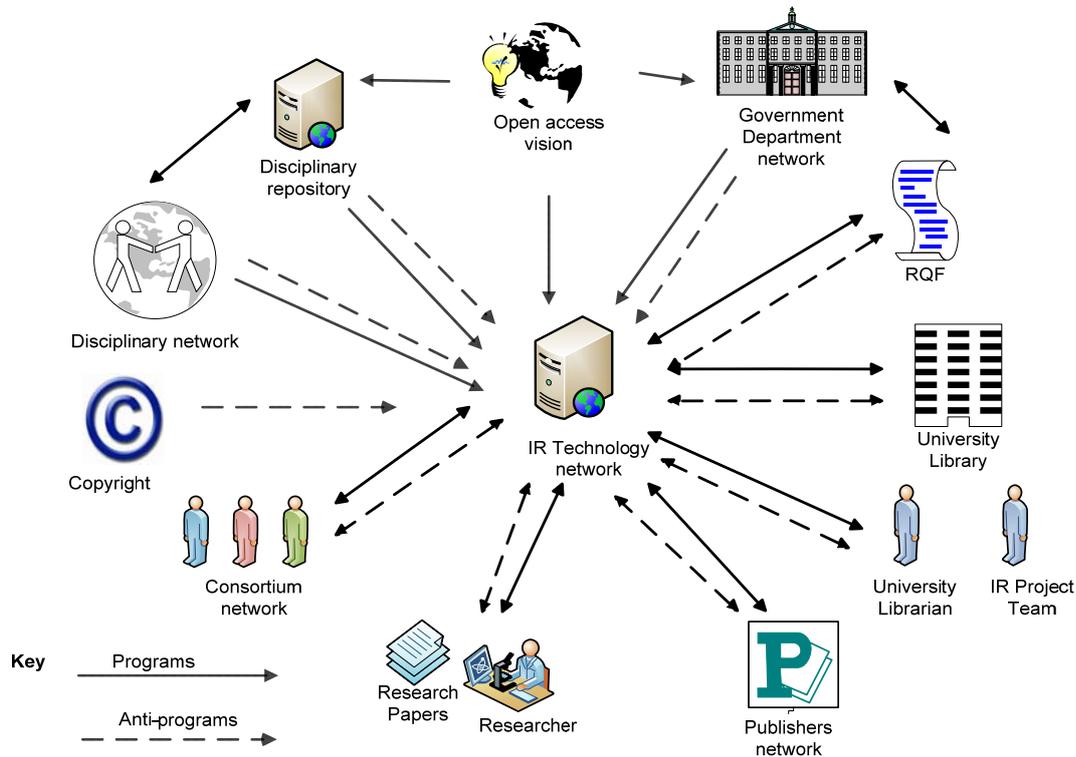


Figure 1: IR Programs and anti-programs at University A

University B, on the other hand, engaged with OA early. In the words of the Deputy Vice Chancellor (DVC) of University B:

But if there was a moment which pushed me into action, it was listening to Stevan [Harnad] in the middle of '02 ... [who had] quite far-sighted views about the way that the refereed researched literature might be made more available ...

Furthermore the DVC acknowledged that research and the promotion of research were central to the university's goals and that development of an OA IR fitted clearly into this space.

I mean I can say really clearly now that the research e-prints server at [University B] increases the impact and visibility of [University B] research full stop. That is absolutely aligned with institutional goals [DVC].

For this actor the issue was clear. OA IR were good for research, aligned with institutional goals, and for his university there would be some advantage in being an early adopter. Early on, in the history of OA IR University B introduced a repository and instituted a policy requiring its researchers to deposit copies of their work, when it was legal to do so. This type of policy is commonly known as a mandate.

Mandates became an explicit part of the OA landscape at the conference: *Berlin 3 Open Access: Progress in Implementing the Berlin Declaration on Open Access to Knowledge in*

the Sciences and Humanities with an agreed recommendation that "In order to implement the Berlin Declaration institutions should implement a policy to: require their researchers to deposit a copy of all their published articles in an open access repository. These requirements to deposit became colloquially known as mandates. The implementation of mandates world wide and in Australia has been slow, but gathered momentum in 2008 with faculties in prestigious institutions such as the Harvard Faculty of Arts and Sciences instituting such a policy on February 12th 2008 and the Faculty of Law following suit in May 2008. Stanford Faculty of Education joined the growing number of OA Mandates in June 2008. During Open Access Week 2010, a challenge issued by Eprints saw "14 new mandates ... adopted. Of these, 7 were institutional, 3 were departmental and 3 were mandates on theses. In addition, one was a multi-institutional mandate, the first ever, covering the 29 research institutes of the EUR-OCEANS consortium" (Carr, 2010)

Research funders have also instituted mandates, for example the Wellcome Trust (Oct. 1 2005); seven of the 8 UK Research Councils by 2008; the Swiss National Science Foundation (Sep. 4th 2007); and the US National Institute of Health (October 2007) (although this latter Mandate has been challenged by a group of publishers). In Australia, the Australian Research Council (ARC) from December 4th 2006 requests that fundees make their work OA or explain "why not" but does not enforce this. Mandates are likely to spread in Australia with the recent Innovation Report by the Federal Government containing recommendations such as:

Recommendation 7.10: *A specific strategy for ensuring the scientific knowledge produced in Australia is placed in machine searchable repositories to be developed using public funding agencies and universities and drivers.*

Recommendation 7.14: *To the maximum extent practicable, information, research and content funded by Australian government including national collections should be made freely available over the Internet as part of the global public commons... (Australian Government Department of Innovation, 2008).*

These recommendations were backed up by the minister's speech:

The last big idea in the report I want to touch on is open access. It is embodied in a series of recommendations aimed at unlocking public information and content, including the results of publicly funded research. The review panel recommends making this material available under a creative commons licence through:

- *machine searchable repositories, especially for scientific papers and data*
- *cultural agencies, collections and institutions, which would be funded to reflect their role in innovation*
- *and the internet, where it would be freely available to the world.(Carr, 2008)*

As at the 16th September, 2008 ROARMAP⁶ recorded the 22 institutional, 4 departmental and 27 funder mandates, in total 53 mandates.

The EPrints Open Access Challenge bought the total number of mandates recorded in ROARMAP as at the 13 November 2010 to 105 institutional, 28 departmental, 46 funder, 68 thesis mandates, and one multi-institutional mandate. In total the number of mandates are currently 248.

⁶ <http://www.eprints.org/openaccess/policysignup/>

Mandates have grown worldwide. However, they still only form a part of the armoury of a very small number of IRs despite having a great effect on self-archiving. (Callan, 2007, Cochrane and Callan, 2007, Xia, 2007, Sale, 2006b, Sale, 2006a)

However, rather than enforcing the mandate with brute force, University B supported researchers with time and education (about the repository, open access and issues such as copyright and author/publisher agreements), and with assistance provided by librarians. Furthermore, University B immediately made the repository open and compliant with Google and Google Scholar, so researchers could search and easily find their work and imagine that others would also do so.

Many of the anti-programs that exist at University A also exist at University B, such as perceived copyright issues, researcher and reward system affiliations with traditional publishing, and so on, however, the additional programs such as the mandate, openness to search engines and the clarity of congruence with the university's mission tipped strength to the side of the OA IR program (see Figure 2). The University B IR has one of the highest concentrations of OA content.

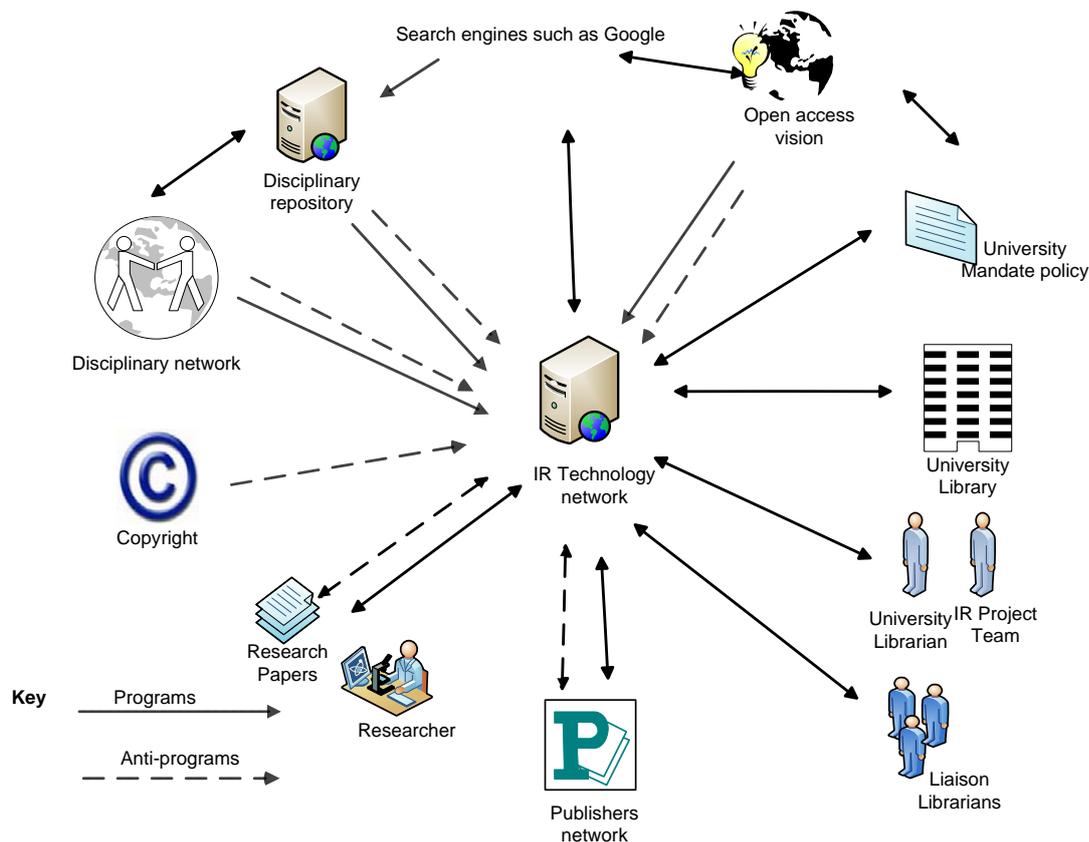


Figure 2: IR Programs and anti-programs at University B

The programs supporting OA and the IR are stronger at University B, and the anti-programs are stronger at University A. When researchers' connections and entanglements with the anti-programs are stronger than their relations and connections with OA and IR, the *status quo* is

preserved. University A's repository had an ambivalent identity from the beginning (for its first three years only providing feedback to implementers rather than acting as a working OA IR, initially only targeting grey literature etc.), and this appeared to actively or passively discourage researchers from adopting it. The ambivalent nature is a result of relations with implementers who themselves expressed ambivalence towards the OA vision.

Those researchers interviewed for this study from both universities (except for one or two researchers with deep reservations about the traditional publishing network and the role of traditional publishers) indicate that they do not wish to see the demise of traditional publishing, especially peer review and the particular journals and conferences they value. However, most researchers acknowledge the congruence of the OA vision with their mission as researchers. Similarly, they acknowledge the congruency of the idea of an institutional repository collecting, maintaining, showcasing and curating the research output of a university. Indeed many pointed to how this work performed through one central repository could streamline the currently multiple kinds of research reporting and visibility-making they are required or keen to do.

CONCLUSIONS

It is hard to argue that research, often funded out of the public purse, should not be a public good, and should not be equally accessible to rich and poor. Increased accessibility is afforded by the development of the Internet, search engines, and other associated information and communication technologies. Many technological actors have played very important roles in the scholarly publishing OA story and in this paper I have focussed mainly on the IR. But the IR could not do its work without its colleagues, the Internet and the World Wide Web, search engines such as Google and Google Scholar, OAI-PMH and others. In the words of a Professor of Business at University B:

There has been a technology shift that shows in some respects what we are doing with thousands and thousands of journals that begin here and end there and the whole system that is set up for this brick and mortar world. We wouldn't come up with anything like that if we invented academic publishing today.

Further, as the repository affords other benefits (in the words of interviewees: backup, "a nice ordered record", and the convenience of having all ones papers stored in one, easily accessible place, where they will be curated, stored and preserved) in addition to OA, many researchers appreciate these, and almost as a by-product of these relations come to appreciate OA.

The major implication of this research is the increasing relevance of, and necessity for researchers, academic librarians and university administrations to revisit our own attitudes to and behaviour regarding traditional publishing. OA is a vision that is congruent with the ideals of research and scholarship.

... The reason we are in academia is to generate information to disseminate knowledge and to provide that information to as many colleagues and friends and interested people as possible. ... You want to get it out to teachers, to policy makers and practitioners. So OA provides free access to it, [Professor Education – University B],

... Well I mean the profession of scientists are all for OA. The more people can read it with the least barriers the more impact we think we have so we don't want anybody to be excluded from reading our work [Professor Economics – University B].

What can universities, librarians and repository implementers learn from this study? First, that OA is a powerful vision which may be harnessed and used by repository implementers to encourage researchers to place their work into repositories. While at University A, OA was barely mentioned or considered in the first years of the repository implementation, at University B high level managers, the DVC, the University Librarian, the Repository Manager are all enrolled by the OA vision, and back this up with knowledge and support programs for researchers, as well as the mandate. Everybody from the repository software developers beyond the institution, to the implementers and university managers within the institution, are working towards the same ends. This lessens the effects of the anti-programs enacted by, for example, traditional publishing.

It is in the interests of universities, other research institutions and researchers to make that research available to as many people as possible. OA works for researchers by increasing access to their work, by enabling them to visibly claim territory and their contribution to knowledge, by increasing the potential to increase citations and collaborations, and, by increasing the readership of scholarly work beyond the academy to practitioners, patients, and others. The actors working against OA proclaim peer review and quality will suffer. There is no evidence yet for this in the disciplines that are enacting OA. Indeed green OA, through repositories is specifically designed to work in conjunction with the existing traditional scholarly publishing network. If a university has an IR, then this is a good way for researchers to showcase their research, and for the university to showcase the full breadth of its research.

In both cases multiple actors such as liaison or outreach librarians, rhetoric, technology, and other actors were utilised to spread the IR and its OA capabilities. The mandate at University B combines the vision and ideals of OA, with the University's vision to promote its research with a single vision. In analyzing the relationships and entanglements that exist between authors, universities, publishers and other actors we see how these reinforce the current publishing paradigm unless a clear effort is made to achieve and support change. It takes a new actor, such as the mandate or deposit policy, to encourage some universities and authors to look beyond their existing frames. For University A the mandate for thesis deposits and for University B the mandate for deposit of all their research outputs exerts considerable power. Without a mandate the OA message is ambiguous, it does not appear as if the university has unconditional support for OA or its own IR.

An institutional mandate or policy promoting OA signals the university's support for OA to the scholarly corpus. It flags the centrality of research and access to that research as a part of that university's mission. In terms of the university studied, its mandate combined aspects the OA vision and the University's vision into a single vision framed to inform a policy requiring staff to deposit their papers and other research outputs in the repository where this is legal. Why are there so few of them? Some say that it is because we don't need more rules, policies, regulations. However, those of us who work within a university will know the myriad of policies, rules and regulations with which we work, largely without argument, maybe a few minor grumbles. Yet many universities and libraries resist one new rule that will enable the work of scholars to become more accessible to potential readers, reviewers, citers and which will benefit universities by enabling them to manage and showcase their own research output. Interestingly, with only one exception, none of the academics interviewed at University B were against the mandate. Indeed the mandate was seen as a policy which enabled them to learn to share their research in a more open way.

I like the idea frankly. Not that you can actually get academics to do anything just because you have a policy. But I think there should be a repository of all research that's been produced in an institution. It's a really worthwhile thing to have and it should be a requirement that everything be deposited [Senior Lecturer, Information Management].

Others thought the Mandate should be more strongly enforced because they saw a role the repository could have other than simply providing OA to the scholar's work. They saw that the repository could have a role in collection of information for various individuals for performance reviews and institutional reporting.

Ideally it would be in everybody's habit that as soon as you have a new conference paper or if you call it a working paper, something that is ready to be presented in some context, that it should be there, it should be very easy to put it there. I think that is really important. You should be incentivised to do it of course. That is also what I say about the RQF repository. That the way to do this is to let the individuals themselves enter the information and what is not in that repository when you have your PPRS (performance review) as they call it; the review of your achievements. What does not enter in to that does not count for any purposes that benefited ... Then you have an incentive and yeah. Okay the roles. So they sort of have that role. So you put everything new up there so it is accessible... Make sure that what is not available in that repository that does not count when you want a promotion. That does not count when you want more salary. If it is not there it doesn't exist for these purposes. Easy enough! [Professor, Business].

Further, research funders, both private and government, find it in their interests for the research they fund to be openly accessible. Mandates, both institutional and funder are growing apace. It would therefore seem, for the foreseeable future at least, OA, IR and mandates will become an increasingly prevalent part of the scholarly landscape, and therefore something that more library managers should consider.

In analyzing the relationships and entanglements that exist between authors, universities, publishers and other actors we see how these reinforce the current publishing paradigm unless a clear effort is made to achieve and support change. It takes a united effort with consistent messages from many actors, and a new actor, such as a mandate or deposit policy, to encourage some universities and authors to look beyond their existing frames.

ACKNOWLEDGEMENTS

The author wishes to acknowledge with gratitude the support of the John Metcalfe Ph.D. Scholarship at the University of New South Wales for the initial PhD research, the later support of the Research Development Fund of The Faculty of Education at Charles Sturt University, and the valuable feedback from an anonymous reviewer. An earlier version of this paper was presented at the ALIA Information Online Conference & Exhibition January 2011, Sydney, Australia.

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