Redefining 'the librarian' in the context of emerging eResearch services

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Redefining ‘the librarian’  
in the context of emerging eResearch services

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Abstract:  
The authors reflect on their experiences in eResearch roles that are redefining ‘the librarian’ in university research support services. Case studies show how their early work experiences in IT and universities, combined with roles in the cultural sector, enabled a transition into eResearch. The paper argues that librarians can add significant value to multidisciplinary eResearch teams, but must take an active approach to professional development and be open to non-traditional roles. The paper concludes with a discussion of essential skills, knowledge and traits for this emerging area, and practical strategies for individuals and organisations wanting to acquire these.
1. Introduction and broad context

Academic libraries have responded to changes brought about by technology and the ways in which their clients use these technologies by developing new library infrastructure and increasingly delivering collections online. However, librarians in universities also need to respond to technological changes outside the library, in learning environments and as part of the research process.

The use of new technologies by clients (researchers and higher degree students) and partners (Research Offices) is an important driver of change. The term 'eResearch' refers to a multi-disciplinary and diverse range of activities that harness the power of advanced information and communication technologies to do research faster, better and in fundamentally different ways (Hey & Trefethen 2005). Alongside technical development and engagement focused on research teams, eResearch units may also engage in university-wide projects to improve research data management, enhance researcher profiles, better track research impact and comply with emerging funding agency open access mandates.

This changing landscape presents new opportunities for librarians. There is no single organisational method for delivering eResearch services and no well-worn career path into these roles, which five years ago did not even exist. While work is ongoing in identifying the skillsets needed for new roles (Simons and Richardson 2012; Cox et al 2012), case studies can provide examples of how librarians can transition into jobs in eResearch, take advantage of the opportunities such jobs provide, and contribute valuable library-related skills and knowledge in new contexts.

2. Research support and eResearch services at Griffith University

Griffith University’s Division of Information Services (INS) includes both library and information technology (IT) services. Librarians within the INS portfolios of Library and Learning Services and Information Management support researchers in well-established areas such as acquisitions, collection development, copyright advice and information literacy training, and are moving into newer areas such as open access advocacy, publications repositories, research assessment exercises, and bibliometrics (Auckland 2012).

Griffith’s eResearch Services team operates within another portfolio in INS, building and managing technical research infrastructure for supporting researchers. This unit has grown rapidly, largely due to the successful pursuit of project funding both within and external to the University. eResearch Services has expanded the capacity and enhanced the quality of research infrastructure; some of this infrastructure is targeted at specific research needs (for example, to conduct online surveys, to manage participants in a clinical trial, or to manage and publish microscopy datasets) while some is associated with university-wide management and discovery.

Within this team, there are two librarians; neither is a ‘librarian’ by position title or position description, yet both contribute to redefining ‘the librarian’ at Griffith University.
University. These roles require some of the abilities identified by Research Libraries UK as desirable but in short supply within academic libraries:

- advising on preserving research outputs, and on data management and curation (including ingest, discovery, dissemination, and preservation)
- supporting compliance with policy and funding mandates (including, but not limited to, open access)
- successfully seeking funding to support research-related activities, and
- applying advanced skills in developing metadata schema specific to disciplinary standards and individual research projects (Auckland 2012, 3).

Over time, library-based research support roles will grow to accommodate some of the activities currently undertaken within eResearch. However, eResearch roles at Griffith differ from library-based roles in several ways:

- eResearch work combines client services and technical services in ways that cut across the divide between these two areas that is still reflected in many university libraries' structures.
- eResearch at Griffith is almost exclusively organised around projects delivered within a very flat organisational structure. Staff are likely to be working within multiple interdisciplinary teams on a range of projects concurrently. This results in an emphasis on developing skills (and career pathways) in project management and change management rather than staff supervision and service provision.
- eResearch service models generally require staff to act as internal consultants. The work involves challenging stakeholder assumptions and advocating changes required by the external environment but not necessarily sought by clients. A consulting model focuses on a future desirable state, and is quite different from delivering transactional ‘customer service’ based on current needs. It requires personal attributes like assertiveness and resilience that are not evenly spread through the different specialities in librarianship (Williamson 2008).
- The primary working relationships of librarians in eResearch are not with other librarians. Colleagues and superiors come from professional backgrounds in IT, not from libraries. Librarians’ values and body of knowledge are not always well understood or considered essential to eResearch; librarians in eResearch must explicitly demonstrate how their skills can be combined in productive ways with technical specialities, including software development and business analysis.

These differences suggest that at Griffith and within other environments (see Carlson 2013, for example) the success of librarians in eResearch support depends not only on efforts to expand individual staff members’ skills and knowledge, but also on the development of organisational structures, ways of working and career pathways that are outside the current norm.
3. Case studies

In these case studies, we reflect on our own experiences within eResearch, focusing on the skills, knowledge and background that we have found important in our respective roles. We also explore some of the challenges we have faced as librarians in eResearch.

Natasha’s story

After a relatively short and unsatisfying period of work and study in the Information Technology sector, I decided on a career change. I started working in an academic library, transferred my Master’s degree from IT to librarianship and graduated in 2006. Currently a Senior Project Manager in eResearch Services at Griffith University, I am also a practitioner member of the Council of Australian University Librarians Research Advisory Committee, an author of various journal articles and co-author of *New Content in Digital Repositories: the changing research landscape* (2013).

I have been working in eResearch Services at Griffith University since mid-2011 in two different roles: eResearch Senior Specialist and Senior Project Manager. Each of these has been a contract role, though I transitioned into eResearch Services from a long-term permanent position at the National Library of Australia.

While I held a variety of positions at the National Library over the course of eight years, two particular positions prepared me to make the transition into eResearch at Griffith: Manager of Australian Research Online; and Business Analyst / Acting Project Manager of the ‘Party Infrastructure Project’ funded by the Australian National Data Service (ANDS). These positions enabled me to develop transferable skills that facilitated a transition into eResearch, including:

- training and hands-on experience in business analysis that required working with diverse user groups from multiple research institutions and translating their needs into technical requirements
- training and hands-on experience in project management that required managing stakeholders and a project board from the research sector
- working on a project/service primarily focussed on developing technical infrastructure to manage and expose information related to researchers and their research outputs
- being part of multidisciplinary teams that included IT specialists and senior analysts both within and external to the library
- developing knowledge of a range of metadata standards and exchange protocols; skills in applying this knowledge to aggregate metadata feeds for unique resources from multiple institutions in order to expose these for discovery
- knowledge of the national policy landscape shaping research
• a network of colleagues (mostly IT specialists, managers and analysts) operating in the eResearch infrastructure environment across Australia.

These positions were largely solitary and quite unusual among my National Library Resource Sharing Division peers, the majority of whom worked in supporting Libraries Australia products. The experience gave me a strong desire to continue working on projects in the higher education sector, particularly in eResearch and data management. Although librarianship was not listed as an essential qualification on the advertisement for a new eResearch Senior Specialist at Griffith, I felt that my skills and background fitted the position description well, and I was awarded the job.

The eResearch role was initially very challenging, and the hands-on training provided to me upon commencement was extremely minimal. I adopted a pro-active approach that included reading widely and contributing to strategic discussions. As one of only two librarians in a team that was made up primarily of software developers and that sat outside the library, I often felt isolated and sought help and information from colleagues in similar roles at other institutions. Keeping up-to-date in a rapidly developing field was important and I made use of many opportunities (e.g. webinars, workshops, conferences).

A little over six months later, I accepted a promotion to the role of project manager. In this role, I now have overall responsibility for delivering various technical infrastructure projects that enable support for researchers and eResearch activities at Griffith. I have been in the position for over 18 months, during which time I have managed four projects, including the Griffith Research Hub project and several ANDS-funded projects.

My role in the ANDS-funded Gold Standard Record Exemplars project was to manage the creation of high quality metadata records about research data collections held at Griffith and the contribution of those records to Research Data Australia. This required significant technical knowledge to enable metadata crosswalks and exchange to occur between systems within Griffith and external to it. Applying my library-gained knowledge of persistent identifiers, I advised that we take up the ANDS service for minting Digital Object Identifiers (DOIs) for data collections. This helped position Griffith as a leader in describing data collections and facilitating data citation. I shared our experience via a project blog, webinars, workshops and journal articles. The experience contributed to Griffith’s success in receiving further funding from ANDS for a data citation project.

My role in the Griffith Research Hub project has involved leading and directing the work of the project team (largely software developers), managing stakeholders, reporting to the project board, overseeing technical development, and taking overall responsibility for delivering the project within the agreed timeframe, scope and budget. While the project manager did not need to be a librarian, the project has benefitted from having one in the role. As a librarian-IT hybrid, I consider myself as a kind of “babel fish”, who can read software code and metadata alike, translate IT terms to senior management, researcher requirements to IT, and vice-versa. I draw on an in-depth understanding of information management and the broader research policy environment to position project goals and engage with stakeholders.
Sam’s story

I have worked in eResearch support for seven years in three different roles:

- eResearch Senior Specialist, Griffith University (2012-2013)
- Data Management Coordinator, Monash University (2008-2012), and

In each role I was located in a different part of the organisation: an academic department, the Library, and a dedicated eResearch unit. eResearch services were structured and resourced differently in each of these organisations, and the roles of the library and librarians in relation to eResearch varied.

Like Natasha, I came to eResearch from the cultural sector. I previously worked at the National Library of New Zealand (NLNZ), coordinating online delivery of projects like Matapíhi, a portal for digitised collections from galleries, archives, libraries and museums, and Papers Past, a large collection of digitised historical newspapers. I developed transferable skills through this role that enabled a transition into eResearch:

- training and hands-on experience in project management
- working in multidisciplinary teams that included collection curators, and in-house and contracted technical specialists in software development, systems administration, and content conversion
- cross-sector collaboration on projects that involved negotiating different metadata standards and organisational contexts
- working with unique materials in a variety of analogue and digital formats
- dealing with complex copyright and intellectual property issues, and
- translating the needs of diverse user groups into technical requirements.

Moving back into the university environment was to some extent getting ‘back to my roots.’ Prior to undertaking my MLIS in 2001-2002, my working life had been spent in universities in diverse contract roles as a tutor, lecturer, research assistant, records clerk, editorial assistant, assistant archivist, and library assistant. In 1992-95, I completed an MA by research in the humanities and published academic work in peer-reviewed journals and a monograph. This gave me a good grounding in the research lifecycle, including data collection, data analysis, and publishing, areas identified by Research Libraries UK as some of those libraries could support more in the future (Auckland 2012, 20-26).

In my current role, I provide specialist advice within Information Services and to researchers, with a focus on two main areas: metadata standards and practices, and legal, ethical and community obligations in the area of research data management. In 2012-13 my role included:

- working with stakeholders to develop Griffith University’s Best Practice Guidelines for Researchers: Research Data and Primary Materials
- providing advice and referrals to individuals and groups
• engaging with researchers in open-ended improvement processes involving conversion specifications, storage options, planning and protocols, and code and data repositories
• writing grant applications
• delivering training sessions to academic specialist librarians
• contributing to infrastructure projects, including a research data repository redevelopment and the commissioning of a new data store.

Griffith’s redevelopment of its data repository provides a case study of the benefits of having a librarian in an eResearch project team. After evaluating a number of options, Griffith decided in 2012 to move away from adopting an ‘off the shelf’ repository product. I was aware that the California Digital Library (CDL) had adopted a similar approach which they had conceptualised around ‘micro-services’ (Abrams et al 2010). I encouraged the eResearch team to consider our project in this light, as opposed to seeing it as a custom software development. This led to a comparison of Griffith’s proposed architecture with CDL’s design and documentation, to ensure relevant standards and best practice (e.g. use of the BagIt protocol for packaging) were being taken into account. Aligning with CDL means that Griffith is not positioned as a sole player outside the library/repository community (the majority of which are still locked into DSpace, Fedora, ePrints and similar products), but as part of a different, emerging community that includes CDL and Pennsylvania State University Libraries.

I also applied my library experience when a decision was made to adopt a storage solution provided by Griffith’s enterprise infrastructure team. To ensure the storage was fit for purpose, I suggested that we evaluate the proposed solution against ISO 16363:2012, a standard for repository certification that was not familiar to the non-librarians. This proved useful in uncovering a number of previously undocumented requirements, which were related to long-term preservation rather than immediate needs for data deposit and discovery. As a team member, I also raised a number of policy considerations that would not have otherwise been addressed, developing a simple policy statement using the OpenDOAR Policies Tool (2008) and flagging the need to develop a more comprehensive policy in future using the guidelines of the Data Information Systems Committee UK (Green et al, 2009).

Working in eResearch is challenging; most learning happens on the job, through trial-and-error and seeking professional and personal support from a wide network of colleagues. This project has required learning about software development lifecycles and about semantic web and linked open data approaches to metadata; this has been a challenge for someone unfamiliar with emergent graph-based methods of information storage and retrieval. So, while this example demonstrates the benefits of having a librarian involved, it equally shows that librarians must expand their knowledge base if they wish to fully participate in eResearch services. My learning will continue in 2014 as I move into a role focused on change management, which will require further upskilling in new methodologies and participation in a new community of practice.
4. Discussion

Although eResearch roles can be perceived by other librarians as being specialist in nature, we consider ourselves generalists, because we need a broad range of skills, knowledge and expertise, so much so that is difficult to specialise in any one of these. ADHD Librarian (2010) reflects on this concept of a generalist, suggesting:

We should be able to adapt our skills to most any situation and know enough of what we don’t know to know that we don’t know it but know how to find out what it is in this context, then use our knowledge of our lack of knowledge to fill the gaps in our knowledge for our clients.

Within the generalist eResearch support role, however, it is possible to identify a core set of skills and knowledge, including the following:

1. Advanced metadata skills

Many librarians have training and experience in creating and reviewing metadata in schemas beyond MARC, but their focus may still be largely on applying item-level descriptive metadata to a limited range of content. eResearch roles require an advanced understanding of metadata in the specific context of research, an understanding that can only be developed through on-the-job learning at the time of need.

Staff need to rapidly acquire and apply knowledge of new metadata schemas, which can be:

- collection-level (e.g. RIF-CS), as opposed to item-level
- specific to certain disciplines, e.g. OLAC for linguistics
- specific to certain types of data, e.g. geospatial standards, or
- related to administration, preservation and rights management. While these new metadata schemas may be familiar in state and national libraries, they are not as commonly in use in university libraries, even within institutional repositories.

The ability to map between schemas, develop custom application profiles, and guide non-expert metadata creators is essential. Involvement in software development projects can enable librarians to develop a working understanding of:

- common protocols for encoding information for the web, e.g. Hypertext Markup Language (HTML), eXtensible Markup Language (XML) and Resource Description Framework (RDF), and
- new ways of structuring and classifying information, such as the use of ontologies and approaches informed by the emergence of linked open data (Stanford Linked Data Workshop, 2011).

2. High level communication skills

Librarians in eResearch roles interact with a wide range of people, both internal and external to the institution, including researchers, senior managers, funding
bodies, software developers, and other librarians. These interactions often have an intent to change behaviour or to make something happen within the organisation; persuasion, negotiation and advocacy skills are important, as is an awareness of organisational ‘politics’. Roles also typically involve public speaking, including providing training sessions, giving webinars, and presenting at conferences. Librarians wanting to move into eResearch may benefit from training courses in presentation skills, opportunities to practice presenting in smaller informal forums (such as staff meetings), and mentoring by senior staff or peers with skills in negotiating complex organisational politics.

Librarians in eResearch need to translate information, such as user requirements, between groups. This requires well-developed interpretation skills, the ability to contextualise technology and its place as part of human endeavour (Abram 2009). In the context of systems librarians, Lim (2007) describes the ability to operate as a broker or boundary spanner, acting as a “bridge between different work communities.” Librarians can develop these skills through work experience in different sectors, volunteering for project teams that contain professionals other than librarians, networking outside the library community and reading in scholarly and general subject areas outside of librarianship.

3. High level documentation skills

eResearch roles require the production of documentation (from project plans, evaluation reports, and policies to training materials, social media updates, and journal articles) for a wide variety of audiences and purposes. This involves more than just factual writing or the production of marketing materials. Additional skills in persuasive writing and the ability to tailor a document by adapting the tone, style and content for each specific audience are essential.

Knowledge that is required to perform well in eResearch support roles includes:

1. Knowledge of the broader research environment

Providing leadership and strategic advice requires an understanding of the drivers for research at both institutional and national levels, including funding agency requirements. Librarians in eResearch can expect to work with agencies and initiatives from the broader sector, such as ANDS, National eResearch Collaboration Tools and Resources (NeCTAR) and Research Data Storage Initiative (RDSI). Librarians wanting to move into eResearch need to actively scan their international, national and local environments and to identify opportunities and threats presented by changes in research policy and strategy.

2. Knowledge of the research process and of scholarly communication

Knowledge of how research is conducted and how results are disseminated is important. Librarians in eResearch need a strong awareness of changes in scholarly publishing, including the role of open access, emerging trends such as data journals, and how research outputs are measured (bibliometrics, altmetrics, data citation, research profiles and impact). A range of options for self-learning, including events, journals, email lists and social media networking are available.
An understanding of research methods, including common data types, how data is routinely captured and analysed, and what tools are most commonly used by researchers, also assists with researcher engagements. This awareness is largely built on the job, but librarians could prepare through training in research methods, experimenting with common tools used by their researchers, and by reading current research with a focus on the methods and technologies used.

3. Knowledge of legal and regulatory frameworks

eResearch roles require a working understanding of aspects of contract law and of copyright, in particular licensing and re-use. Work with legal experts is often required; it is not uncommon to be expected to draft terms and conditions around deposit in, and use of, research repositories, and to provide basic advice on these issues. Other legal and regulatory aspects that can arise in this work include intellectual property other than copyright (e.g. patents, indigenous cultural property), public records, privacy, right to information (RTI), content classification, and national and institutional codes including the Australian Code for Responsible Conduct of Research (NHMRC et al 2007).

Librarians in eResearch roles will benefit from generic skills and knowledge:

1. Technical skills

Barron (2013) notes that “Librarians and IT staff respect and require one another and yet often have these difficult relationships... Librarian-IT hybrids operate in this strange intersection and in the midst of this unusual symbiotic relationship.” In eResearch, project teams are comprised largely of software developers. Whether a librarian is acting as an advisor, participant or manager, technical skills in areas such as systems design, business analysis (gathering and documenting requirements) and usability testing are useful in understanding how eResearch projects are run and in translating ‘IT speak’ to researchers and research managers. On-the-job learning, professional reading and peer mentoring by colleagues from IT are all ways librarians can learn the basics before embarking (if required) on industry training.

2. Project management

Being able to manage projects successfully is an asset in the eResearch support role. While project management certification will not be needed by most librarians, a project management course is an effective way to gain an understanding of project lifecycles, project management methodologies, internal project management frameworks (including governance) and reporting requirements. Further details on this are provided below.

The skills and knowledge outlined above can be acquired, but are there personality traits that have a bearing on undertaking these types of roles? Williamson et al surveyed more than 2,000 librarians and suggest that “different librarianship subspecialties can be differentiated by broad and narrow personality traits” (2008, 282). This study and others have shown that there are significant differences between “technique-oriented” and “people-oriented” specialities. The ‘cluster’ in the
2008 study most closely aligned to eResearch would likely be more technique-oriented “adaptive archivists and systems librarians”, characterised as high on assertiveness, openness, and tough-mindedness, or the “adaptive other information professionals”, characterised as high on adaptability, assertiveness, autonomy, customer service orientation, emotional resilience, extraversion, openness, optimism, teamwork, and work drive.

In considering how librarians can move into roles in eResearch, organisations could consider more actively recruiting for certain traits useful for this kind of work, and offering development opportunities not just focused on skills, but on traits such as resilience.

Individual librarians could benefit from a personality inventory that would highlight the degree of fit between their current work preferences and the traits required for new areas (Williamson et al 2008, 283). In eResearch roles, it is beneficial to be adaptable, assertive (without being aggressive), creative, well-organised, analytical and able to work both autonomously and as part of a team. New roles in eResearch can be ill-defined, and it is largely up to the occupant to take the initiative and redefine the role of librarian in this context.

5. Pathways

Formal education

Worldwide there are few courses in eResearch-focused librarianship; in late 2013, only five universities in the US were offering graduate certificates in data management or digital curation. However, there are often electives that would be useful in an eResearch context, in topics such as data management, databases, simulation and modelings, consulting skills and business analysis.

While universities can gradually introduce new areas into the library and information studies curriculum, these new developments require existing staff to grow and develop. “Career-long learning is therefore integral to professional success, and individual professional development needs to be supported through a combination of education, personal achievement and work-based opportunities.” (Fisher 2006, 49-51). The rest of this section explores options outside formal education.

Training courses

Project management training is highly desirable and comes in a number of different flavours: PRINCE2 versus PMI (Project Management Institute); traditional ‘waterfall’ methods (in which upfront planning is the focus) versus emerging ‘agile’ methods. While project management electives may be available in a library qualification, training in the methodology that is adopted within the organisation at the point when it can be put into practice will be more helpful. Libraries may wish to have in-house training developed, so that all staff gain a shared understanding of the terminology and methodologies.
A number of face-to-face courses cover topics relevant to eResearch, including:

- Research support services for academic and special libraries (one week intensive, Queensland University of Technology), and
- Reskilling for Research (one day, Australian Library and Information Association).

Informal learning

Informal learning can be described as job-related training that does not lead to a formal qualification or certification (Simons and Richardson 2012, 6). This includes conferences, as well as supervisor- and peer-assisted learning.

Events

Librarians wanting to move into eResearch should identify events that focus on the use of information and communication technology in research and that offer the chance to network with other professional groups.

**Table 1: Events for librarians interested in eResearch**

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<tr>
<th>Focus</th>
<th>Examples</th>
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<tr>
<td>eResearch</td>
<td>eResearch Australasia&lt;br&gt;International Digital Curation Conference</td>
</tr>
<tr>
<td>Repositories</td>
<td>CAUL Repositories Community&lt;br&gt;Open Repositories</td>
</tr>
<tr>
<td>Discipline-based research methods and technology</td>
<td>Australasian Association for Digital Humanities (aaDH)</td>
</tr>
<tr>
<td>Research administration policies and systems</td>
<td>Australasian Research Management Society</td>
</tr>
<tr>
<td>Technology in higher education</td>
<td>THETA (The Higher Education Technology Agenda)</td>
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Embedding / placements / joint appointments

Opportunities for librarians to work with other professions and for eResearch specialists to share expertise within the library should be encouraged.

At Monash University, an arrangement in 2012-13 between the Library and Monash eResearch Centre (MeRC) saw Kathryn Unsworth, the Library’s Data Management Projects Officer, spend two days a week working in MeRC. Kathryn writes:

> Although we share considerable common ground, the Library and MeRC approach project management in radically different ways. Working with business analysts, software developers, and lab teams
using agile methodologies highlighted the efficacy of small project teams and the role accountability plays in heightened productivity. One of many valuable learning experiences! (personal communication 9 September 2013)

At QUT, Siobhann MacCafferty, the Research Data Manager from the Institute for Future Environments, currently spends two days a week alongside staff in the Division of Technology, Information and Learning Support. Siobhann writes:

Having similar roles in very different business areas of the university makes me really aware of how wide the field of Data Librarianship and eResearch is and how our roles within it are still evolving. (personal communication 6 September 2013)

Embedding strategies can also be adopted, such as QUT Library’s joint appointment with the Institute of Health and Biomedical Innovation of an IHBI Information Manager: “Immersion in the research environment has been key to the success of this role and enabled the Information Manager to develop a deep understanding of researchers’ needs and issues” (Stokker 2008).

Peer mentoring

Peer coaching and mentoring have emerged as approaches to professional development in work environments in healthcare and academia, but are not as widely reflected in the library literature as more traditional mentoring arrangements.

Monash University’s Research Data Collections Project provides an example of the use of the networks that already exist between staff in university libraries as a means to develop confidence and skills. Over an eighteen-month period, more than thirty-five Library staff participated in the project. This was achieved by recruiting internally for the project, meaning project staff were already part of larger peer networks; involving subject librarians in early work identifying potential interviewees; and establishing a ‘buddy system’ for interviews, which provided a safe, staged process in which staff could build confidence by accompanying and observing their peers (Todd et al 2011).

Self-training

Self-training can be described as forms of study in which staff are largely responsible for their own instruction (Simons and Richardson 2012, 7). This can include self-paced training, professional reading, participation in face-to-face and online communities of practice, and social networking.

Self-paced training

Librarians can avail themselves of self-paced training resources – for librarians and for researchers - that have emerged internationally:

- Targeted at librarians
  - DIY Research Data Management Training Kit for Librarians (University of Edinburgh)
- Data Intelligence 4 Librarians (Universities of Delft, Eindhoven and Twente, with the Netherlands Data Archiving and Networked Services)
- RDMRose (Universities of Sheffield, Leeds and York)

- Targeted at researchers
- UK Data Archive Training Resources.

Institutional and domain communities of practice

Libraries can create forums in which larger groups can get together to learn about eResearch-related topics. Monash University formed a group of library staff in 2008 that met regularly for presentations and discussions for several years (Clarke et al 2009). At Griffith, a Research Data Management Community of Practice, involving librarians, technologists and research office staff, has met three times since October 2012. Both forums have brought large groups of people (up to fifty per session) together for networking as well as for formal presentations.

Librarians can also look outside their institution for communities of practice that cover related topics, such as open access, e-government, geospatial information, and digital humanities.

Other methods

Table 2: Informal learning for librarians interested in eResearch

<table>
<thead>
<tr>
<th>Channels</th>
<th>Examples</th>
</tr>
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</table>
| Professional publications | Journal of Librarianship and Scholarly Communication  
                          | Journal of Library Metadata  
                          | D-Lib Magazine  
                          | International Journal of Digital Curation  
                          | Journal of eScience Librarianship  
                          | Ariadne Web Magazine for Information Professionals |
| Mailing lists         | jisc-repositories@jiscmail.ac.uk (JISC, UK)  
                          | cairss@googlegroups.com (Aus)  
                          | Research Data, Access & Preservation – email rdap@asis.org (US)  
                          | australian_oa_community@anu.edu.au (Aus)  
                          | RESEARCH-DATAMAN (JISC, UK)  
                          | ARL-data-sharing-support-group (US)  
                          | ANDS-Partners - email contact@ands.org.au (Aus) |
| Newsletters           | Share – ANDS newsletter                                                   |
| Webinars              | ANDS YouTube channel                                                     |
| Bookmarking           | Mendeley Group – Data Management for Librarians                          |

In addition to the channels noted above, Twitter is a valuable forum for discussions amongst eResearch practitioners and data librarians.
6. Conclusion

There is no clear career pathway into eResearch work, or necessarily a clear pathway once engaged in eResearch. With the support of library managers and peers, librarians can take an active approach to their own professional development and learn much of what is needed for eResearch through networking, professional reading, and practical experiences on projects. However, in many respects, this kind of work, while central to institutional and library strategic plans, is still seen as separate from university libraries’ core functions. Topics for further exploration include awareness of career options for new graduates, the casualisation of eResearch roles, and the sustainability of eResearch services.
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