

## **Research Data Management support: sharing our experiences.**

Nel Duffield, University of Adelaide Libraries,  
Ann Morgan, University of South Australia Library,  
Liz Walkley Hall, Flinders University Library.

### **Introduction**

The importance of Research Data Management (RDM) has seen a rapid rise in the university sector, driven by the increase in data intensive research, funding body and publisher requirements around open data, and the need to demonstrate the value of research data as a research output in its own right. University libraries have been quick to realise the value in offering RDM support to their institutions, with many examples in the literature of institutional case studies both in Australia (Groenewegen and Treloar 2013, Thomas 2011, Nixon et. al. 2014, McAlpine and McIntosh, 2015) and overseas (Akers et. al. 2014, Delserone 2008, Moon 2014, and Wilson et. al. 2011). This paper shares the experiences of the three South Australian university libraries in this area: how we have created and shaped our RDM services, the skillsets our Librarians have developed, and lessons learnt that we can share. Even though we all are geographically located in South Australia, each institution has developed its own approach to best suit its local requirements; however, collaboration and integration with university-wide systems wherever possible is key to the services offered by all three institutions.

## **What is Research Data Management?**

Research data - those data generated or collected as "primary sources in the production of original research and would be required to validate or replicate research findings" (Callan et. al. 2009, in Thomas 2010, 38) - has seen an unprecedented growth across the disciplines. Research data are created at different stages of the lifecycle of a research project and can vary in format from Excel spreadsheets to images and video files. Some disciplines - especially those in the 'big data' category - have already established discipline norms for storing and sharing their data. It is often smaller datasets (defined as up to 200 GB) that require support and can be more difficult to manage and, it is argued, where libraries should concentrate their efforts (McAlpine and McIntosh 2015, 4).

RDM is "the organisation of data, from its entry to the research cycle through to the dissemination and archiving of valuable results" (Whyte and Tedds, in Pinfield, Cox and Smith, 2014, 29). Sometimes also referred to as Research Data Services (Tenopir et. al. 2013), it is an area of service delivery that has seen rapid take-up by university libraries. While the US was an early starter, with many institutional case studies being written up in the literature, the UK, Australia and Asia were not far behind (Corrall, Kennan and Afzal 2013, 645). Although still not considered a core service for many university libraries, RDM has certainly entered a more mature phase of its existence.

## **Institutional profiles**

The University of South Australia (UniSA) is Australia's university of enterprise and is a globally-focused, locally-engaged institution established on the dual principles of equity and excellence. With more than 32,000 students, around 6,000 of whom are

international students, the university is South Australia's largest and offers degree programs across a wide range of subjects including business, law, education, arts and social sciences, health sciences, information technology, engineering and the environment. The University is based on four sites in the City of Adelaide and in 2 regional campuses in South Australia – Whyalla and Mount Gambier – and has physical libraries on 5 of these campuses.

Established in 1874, the University of Adelaide is Australia's third oldest university. With an international reputation for conducting world-leading research across a wide spectrum of areas, the University constitutes a vibrant and diverse community with over 25,000 students and over 3,500 members of staff across three main campuses- North Terrace; Roseworthy; and Waite. The University Libraries comprise five physical libraries in addition to Rare Books and Special Collections, and University Archives & Recordkeeping.

Flinders University is a leading international university in Australia with a record of excellence and innovation in teaching. Flinders has research strengths in medicine, nursing, sociology and psychology (QS World University Rankings by Subject, 2016). The student population comprises approximately 16,000 undergraduate students and 9,000 postgraduates and its academic population and professional staff is around 2,700. The main teaching and research campus is located south of the city of Adelaide, with several regional and interstate locations. Flinders University Library comprises the Central Library as well as three branches - the Law, Medical and Sturt Libraries.

## **RDM support at University of South Australia**

Research support at the University of South Australia is provided by a number of central support units, and in several instances the Library collaborates with different units to efficiently and effectively support our academics and research students.

RDM is one of these instances where the Library has collaborated with staff from Information Strategy and Technology Services (ISTS) and Research and Innovation Services (RIS). The changing nature of Librarian skills, reduction in borrowing of Library collections and increased use of the Library space for different methods of study encouraged management to investigate the different and emerging areas where clients require support. It also became apparent from appointments with researchers that staff needed to familiarise themselves with their terminology and the different phases of the research lifecycle. Traditionally Library staff were only involved with the research outputs or publications, but it became apparent that assistance could also be provided with other phases of the lifecycle – including planning, and advising researchers where to search for similar projects and collaborators. So the progression to working with colleagues to provide support around the concept of managing research data was a natural maturation.

University of South Australia targeted Data Management Planning as the first area to focus on in the RDM realm. Creating a Data Management Plan is one of the key steps to a successful Research Project, and allows the researcher to fully think about the project from different perspectives and plan for different circumstances that may occur throughout the project lifecycle. For example if the researcher knows the publication they want to publish in requires access to datasets, they can obtain a Digital Object Identifier (DOI) in a timely manner prior to submitting an article; the

researcher should also plan to seek permission of the research group when acquiring consent, so this should also be considered during ethics application.

In 2011 the Library, RIS and ISTS collaborated to develop a customised Data Management Planning System. It ingests metadata from other corporate systems which minimises the need for academics to duplicate information that is already held elsewhere. Library staff have developed excellent relationships with researchers, and are ideally placed to utilise this relationship to further enrich the project, collection and dataset metadata during the lifecycle of the project. The system also interacts with the publications and repository systems to ingest information on publications associated with a research project. At the end of the research project the metadata stored in this system can be used to populate a record in Research Data Australia (via the UniSA [Data Access Portal](#)), thereby promoting the project and researcher(s) to a global audience. In essence it is central hub for all metadata related to specific research projects conducted at the Institution. A simplified version of the system is also available for staff and Higher Degree by Research (HDR) students to allow them to generate a Data Management Plan, which can be updated regularly and used at any stage of the research lifecycle – at the start of the application process, during concept development, during the ethics application process etc.

In 2015 a Research Data Management Portfolio was created in the Library to progress with raising academics understanding of RDM and to raise awareness about the concept of RDM – specifically Data Management plans – and what support, services and resources are available at UniSA. A complex communication

strategy was created and executed which involved staff from Library, ISTS and RIS at different stages. The main method of communication was via a series of Research Data Management webinars which were accessible to all internal, external and regional staff and students. Table 1 identifies the locations and attendees of the sessions during this first phase, including nine virtual attendees.

<b>Location</b>	<b>Attendees</b>
Whyalla	11
Mawson Lakes	33
City East	30
Magill	10
City West	14

*Table 1: UniSA RDM seminars - locations and attendees*

Some sessions were streamed live or could be accessed via Virtual classroom, and all sessions were recorded. Videos of these sessions are now available online, and have been shared with attendees. Support materials are also available in the form of a comprehensive [Research Data Management guide](#), which provides information about the support and services available at UniSA and from external agencies. This is an extremely popular resource and attracted over 1,000 hits within a few weeks of publication. In addition videos and a series of webpages dedicated to Researchers are available. The Library is promoted as the initial contact point for all enquiries related to RDM at the University, and staff can refer queries to relevant units at the institution where relevant. Feedback from these sessions is extremely positive.

Some attendees were completely unaware of the concept of RDM and the importance of a Data Management Plan, National support agencies or the range of support available to them at UniSA.

The Library, RIS and ISTS continue to provide support in the form of seminars and presentations to staff and students in different cohorts, groups and locations.

Supporting content and materials is being revised on a continuing basis and Library staff are initiating conversations with key active academics to raise awareness and educate students and staff in this area.

### **RDM support at University of Adelaide Libraries**

Research Data work at the University of Adelaide Libraries began in 2011, when the University entered into a partnership with the Australian National Data Service (ANDS) on the Showcasing Research Data Project. The project identified collections of research data that could be described through Research Data Australia; and was intended to elicit researchers' requirements for a University of Adelaide research data repository and metadata store that could be applied more generally. A new Research Data Librarian position was created to lead this work.

As this project drew to a close, it was apparent to University Libraries that there was critical ongoing work in this field; and a need to take an active and targeted approach. The Research Data Librarian position was maintained, but now partially funded by the Library and partially funded by the Office of the Deputy Vice Chancellor (Research). This funding arrangement clearly signaled to the wider University community the key role of the Library in the research lifecycle. In recognition of the importance of this activity to the future of the University Libraries, the Research Data Librarian position reported directly to the Deputy University Librarian.

The Research Data Librarian made substantial progress asserting the Library's role in this space, working closely with researchers and staff from DVC(R), Technical Services and the Library to develop joint initiatives and strategies. One of the primary roles for the Research Data Librarian continues to be leading ANDS projects. The University of Adelaide has been involved in three major projects; the initial Showcasing Research Data, Major Open Data Collection and High Value Collections. These projects had a number of aims and outcomes but were intended to make internationally significant research data collections openly accessible, to enable research, enhance institutional partnerships and grow the international reputation of the University of Adelaide.

Another significant activity in the RDM sphere was the creation of a face-to-face seminar aimed at academics and Higher Degree by Research students, called 'Getting Smarter with your Data'. This seminar was delivered by the Research Data Librarian but run through the Graduate Centre, which is responsible for the management and administration of research education at the University of Adelaide. This partnership with the Graduate Centre conferred a credibility and authority to the seminar and to the Library, which was advantageous in a time when the University's approach to RDM was in development.

<b>Title</b>	<b>Year</b>	<b>Number of sessions</b>	<b>Attendees</b>
Getting Smarter with your Data	2013	4	43
	2014	5	62
	2015	5	80
Managing your Research Data	2015	3	49

*Table 2 University of Adelaide RDM seminars - sessions and attendees*

The Library built upon this success by developing a four module Researcher Training series, informed by a survey into the eResearch needs of staff and HDRs. The modules include *Demystifying your Research Metrics*, *Publishing with Impact*, *Social Media for Research Success*, and the redeveloped *Introduction to Research Data Management*. The final module remains the flagship of the series, with a monthly face to face session with high attendance and positive feedback. Online modules are being developed as an alternative or supplement.

During the development of the Researcher Training Series, the Research Data Librarian role evolved. The job title was changed to eResearch Support Project Librarian to highlight the increasing importance of electronic data. The reporting line to the Deputy University Librarian had demonstrated the importance of the role, but could be argued to isolate it. The role was realigned to the Learning and Research Services Department; which largely consists of discipline aligned Research Librarians who support students, academics and research staff. The intention was to more deeply embed the outcomes of the work of the eResearch Librarian in the daily work of the Research Librarians. The eResearch Librarian would trial new ideas, spearhead projects, and provide a single point of liaison with the broader Research community inside and outside the University. She could call upon the Research

Librarians to support her in this work- testing ideas against their deep discipline knowledge. Then as work became mainstreamed it could seamlessly become part of the work of the rest of the Department. Understanding the fundamentals of RDM is now a basic requirement of all Research Librarians at the University of Adelaide.

Meanwhile, DVC(R) was working on the [Research Data Management and Primary Materials Policy](#) intended to ensure the data used to develop research outputs was securely stored and reliably accessible. The eResearch Librarian was part of the advisory committee for the policy, side by side with researchers, and staff from DVC(R) and Technical Services. The documented role of the library was to lead education and training to the University community about how to implement the policy - specifically the creation and storage of RDM Plans. The University of Adelaide is currently investigating infrastructure options to support the implementation of the policy, and the Library is a key partner with Tech Services and Research groups in the pilot of a proprietary data storage and management solution.

### **RDM support at Flinders University Library**

Flinders provides RDM services through a library operational unit called eResearch@Flinders. Developed in 2012, and initially funded in part by an ANDS Metadata Stores project, the unit is now a permanent part of the library's services and is fully funded by the library. The unit consists of six permanent staff, comprising its Manager, as well as the Open Scholarship and Data Management Librarian, the eResearch Support Librarian, the Publications Support Librarian, the University's Copyright Officer and the University's Statistical Consultant. All staff in the unit (with the exception of the Statistical Consultant) have backgrounds in librarianship. The

activity of eResearch@Flinders can be divided into four complementary areas: engagement with Flinders researchers about eResearch tools and services; RDM (including data reuse and statistical consulting); open scholarship; and external engagement (Nixon, et. al. 2014, p6). While the focus of this paper is of course on RDM, it should be acknowledged that there is much overlap within the unit, and staff, around the four areas.

Reporting to the University Librarian, the eResearch@Flinders manager also works closely with other internal and external stakeholders. Internally, these include the Deputy Vice Chancellor (Research) and the Executive Director for ICT Strategy and Integration, as well as the Research Services Office and Information Services. Externally, it includes service providers such as eResearch SA and SA/NT Datalink, as well as working on cross-institutional projects (e.g. to support researchers funded by the Goyder Institute) and taking an active role in joint projects to, for example the development of ReDBox.

RDM services include responsibility for the Flinders University research metadata store, the quality of metadata harvested by Research Data Australia, data management planning (including the provision of a data management planning tool), a referral service for data storage, advisory for open data especially with regard to funder requirements, and advocacy for data reuse. That RDM sits with an organisational unit with wider eResearch advocacy and liaison responsibilities means that Flinders can provide “cradle to grave” RDM services.

Flinders University Library was a lead partner in the development of the data management planning functionality in ReDBox software. Implementation of this software has meant that Flinders researchers can create data management plans before or during their research project. This is offered as a mediated service by eResearch@Flinders, allowing us to identify projects that may benefit from other eResearch tools and services. For new projects, and projects in their early stages, this includes high performance computing, high volume data storage, and cross institutional collaboration tools. For researchers who might present later in the research lifecycle seeking assistance with RDM, advice may also be given on research data discovery and data citation opportunities (via Research Data Australia exposure, and the allocation of a DOI to their research dataset) as well as advocacy around open access to research data. In addition, eResearch@Flinders also takes an advocacy role in encouraging the reuse of existing research data. This might be in the form of raising awareness of Research Data Australia as a discovery tool, encouraging the use of linked data through the SA/NT Datalink, or mediating access to confidential datasets available through the Australian Bureau of Statistics.

While one-on-one consultations are often used to service the needs of researchers' queries, eResearch@Flinders also offers outreach and training in the form of workshops and events. This was especially useful in the early days, both as a way to deliver information about eResearch@Flinders as a new service as well as to bring researchers together from across disciplines and Faculties. More recently, eResearch@Flinders has tapped into the workshop series offered by Flinders' Office of Graduate Research to deliver information about RDM to research higher degree students. Feedback from these sessions has been positive, and interestingly has

attracted attendance from the wider university community. Our next level of engagement is planned around more intensive online support, including short video segments to delivery basic RDM support information.

As with other university libraries who have offered RDM support, a key challenge remains encouraging cultural change. Even though many academics acknowledge they need support in managing workloads, it is not surprising that the time investment required to engage with services designed to do just that can be challenging in itself. We have found that, even when initial contact is welcomed and encouraged, the pace of change and adoption of new practices in the RDM space takes some time and requires ongoing engagement.

### **New skills for library staff**

Library staff have always provided a variety of support and assistance to research staff and students. Across our institutions, this includes: building and maintaining print and electronic collections, literature searching and review support, reference management, citation index assistance, guidance for publishing in journals and books, copyright support, repository management to host research outputs, metadata creation and enhancement, and communication and liaison with researchers. Indeed, many of these skills translate to research support and it has been a logical progression for library staff at all our institutions to build on these skills and provide support in the area of RDM.

However, the majority of Library staff at all three institutions are not research active and may only have limited knowledge of the research process. Each institution has

adopted various initiatives to incorporate an understanding of research work in an attempt to address this. At Flinders University Library, a Research Working Group for librarians was formed to support librarians undertaking practitioner-researcher projects, in order to develop a practical understanding of the *doing* of research (McBain, Culshaw, Walkley Hall, 2013). Practitioner-researchers have applied for Ethics approval for their projects, undertaken data collection and analysis, and written up their results for publication in peer-reviewed journals – all of which has created a deeper understanding of the requirements of researchers. At UniSA, resources, workshops and seminars on RDM were provided and developed to assist library staff in their understanding of the research process. A Research group was also established to encourage Library staff to become more involved in research in our area and staff have worked closely with academics in different Divisions to assist with their research. At the University of Adelaide, Research Librarians learnt through a process of group and self-paced online training and peer support. And across all three institutions, a large number of Library staff are participating in the ANDS 23 (Research Data) Things program which was developed by the Australian National Data Service. Staff from the three South Australian Institutions are also merging at different times during this program to discuss RDM topics and elements of the program to consolidate our understanding of the topics.

## **Discussion**

In all three institutions, there was a demonstrated need for researcher support, and an initial lack of institutional clarity about who in their respective Universities would provide that support. Key staff in the three libraries, however, recognised the opportunity for a tactical repositioning. There was a clear political advantage for all

libraries to work in the RDM space. For the libraries to participate in the development of university-wide strategy and to receive an appropriate level of funding, it was important that the continuing relevance of libraries be understood. For university administration including the Deputy Vice Chancellors of Research and their departments, and for academics and HDRs, this meant being deeply and explicitly embedded within the research lifecycle. Libraries needed to change the perception, and sometimes the reality, that libraries were passive recipients of research outputs, and rebrand ourselves as active partners in the entire research process. However, this move would not have been successful if the libraries had not executed it competently.

Similarly, RDM was seen as a natural extension of the role of the Academic Librarian. Libraries have always managed research output, albeit in the form of books and journals. Librarians had the intellectual frameworks already in place. We are familiar with the fundamental concept of data vs metadata; we are skilled in working with information storage and retrieval within a digital environment; and we have experience with pragmatic requirements such as managing embargoes to satisfy publisher and commercial requirements. We understand and support drivers like maximising the accessibility of information as a form of social justice, making data available for re-use to maximise the potential outputs from tax-funded research, and to allow the validation of research results. Our next challenge is understanding the requirements for digital preservation of research data and ensuring that we are positioned to undertake this role.

While our philosophies behind RDM have been similar, the structure and execution of support has naturally been different, mainly due to the organisational and cultural differences of our larger institutions. The structure of the University of South Australia, with the Library in the same organisational unit as ISTS, meant the creation of purpose built Data Management Planning System was a viable option. ISTS responded to the needs of the Library to develop a system which was tailor made for the specific needs of UniSA. At Flinders University, the creation of [eResearch@Flinders](#) meant that significant resources were directed very early to prioritise this work. The unit had the specific remit to design and implement an effective RDM strategy. At the University of Adelaide, the traction occurred when the University Libraries restructured the RDM activities into the mainstream work of the Research Librarians. Rather than the work operating at a discrete project level, understanding developed across the Library that RDM work was an integral part of the Libraries' interaction with academics.

## **Conclusion**

Despite the differences between our larger institutions, operating within different political climates with different staffing profiles and resourcing capabilities, the three South Australian Universities libraries have all successfully taken a leading role in RDM. We have developed strategies and practices that worked for our own climate, and this tailored approach has given us the best chance to appropriately serve the needs of our individual research communities. Now, in true library style, we are also learning from the experiences of each other and leveraging from our shared strengths. In a time of change in the scholarly communication process, including the decline of traditional formats and the emergence of new channels through which

researchers communicate, making an assertive step into the world of RDM has repositioned our libraries, and the services and skills our Librarians can offer, in the minds of the wider university staff. To put it simply, it has reasserted our relevance to our research communities.

## **Bibliography**

Akers, K., Sferdean, F., Nicholls, N., Green, J. 2014. Building Support for Research Data Management: Biographies of Eight Research Universities. *International Journal of Digital Curation*, Vol. 9, No. 2, pp. 171-191. doi:10.2218/ijdc.v9i2.327

Corrall, S., Kennan, M. and Afzal, W. 2013. Bibliometrics and research data management services: Emerging trends in library support for research. *Library Trends*, 61 (3). pp. 636-674.

Delserone, L. M. 2008. At the Watershed: Preparing for Research Data Management and Stewardship at the University of Minnesota Libraries. *Library Trends* 57(2), 202-210.

Groenewegen, D. and Treloar, A. 2013. Adding Value by Taking a National and Institutional Approach to Research Data: The ANDS Experience. *International Journal of Digital Curation*. Vol. 8, No. 2, pp. 89-98. doi:10.2218/ijdc.v8i2.274

McAlpine, K. & McIntosh, L. 2015. Honing the edge: an integrated model for supporting research. *ALIA Information Online 2015 : at the edge*, ALIA, Sydney, pp. 1-13.

McBain, I., Culshaw, H. and Walkley Hall, L., 2013. Establishing a culture of research practice in an academic library: an Australian case study. *Library management*, 34(6/7), pp.448-461.

Moon, J. 2014. Developing a Research Data Management Service – a Case Study. Partnership: The Canadian Journal of Library and Information Practice and Research. Vol. 9, no. 1. doi: <http://dx.doi.org/10.21083/partnership.v9i1.2988>

Nixon, A.L., Hall, E., McBain, I., Constantine, R. and Carati, C. 2014. We built it and they are coming: the development of eResearch@Flinders. In VALA2014: Streaming with possibilities. Melbourne, Victoria: VALA. VALA2014. Melbourne Convention & Exhibition Centre, Victoria. Jun 2014.

Pinfield, S., Cox, A.M. and Smith, J., 2014. Research data management and libraries: Relationships, activities, drivers and influences. PLOS one, 9(12), p.e114734.

Tenopir, C., Sandusky, R.J., Allard, S. and Birch, B., 2014. Research data management services in academic research libraries and perceptions of librarians. Library & Information Science Research, 36(2), pp.84-90.

Thomas, J., 2011. Future-proofing: the academic library's role in e-research support. Library management, 32(1/2), pp.37-47.

Wilson, J.A., Martinez-Uribe, L., Fraser, M.A. and Jeffreys, P., 2011. An institutional approach to developing research data management infrastructure. International Journal of Digital Curation, 6(2), pp.274-287.