

SUBMITTED VERSION

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Making researchers' lives easier and managing risk at the University of Adelaide: The research data project, in Atkinson, J. (ed.), *Technology, Change and the Academic Library Case Studies, Trends and Reflections*, Cambridge, MA., Chandos Publishing, 2021, pp. 151-160.

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Originally published at: <http://doi.org/10.1016/B978-0-12-822807-4.00015-4>

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<http://hdl.handle.net/2440/128736>

Making researchers' lives easier and managing risk at the University of Adelaide: the Research Data project

Keywords

Research data management

Research data

Figshare

Research data repository

LabArchives

Electronic lab notebook

Electronic research notebook

Training

Library

Change

Change management

Research data management planning

Research data management planning tool

Abstract

This case study describes the ReDa (Research Data) project that was executed at the University of Adelaide between 2017 and 2019 to provide systems and services to support improved management of research data.

The University of Adelaide is a Group of Eight research-intensive University, and the project was a collaboration between the Library and Information Technology and Digital Services (ITDS), with involvement from researchers and other stakeholders. Library staff provided subject matter expertise and filled the business owner role for the systems implemented in the project.

The ReDa project is considered to have been very successful, and the case study presents the key reasons for that success; namely, good strategic planning, highly effective change management and engagement with researchers, skilled project management including good management of staff turnover, skilled and expert staff, and significant effort to transition to business as usual throughout the project.

The research for the case study comprised interviews with key players who worked on the project, and reading planning documents from the time of the project's initiation in order to understand the project's genesis.

Familiarity with some research data management and technical terminology is assumed.

Aims and objectives, rationale and context for the work

The ReDa project was originally intended to deliver Figshare as a research data repository following a successful proof of concept. This was seen as a response to the University's lack of an institutional repository for publishing research data, and a number of problems that flowed from that lack:

- Research publishers and funders were increasingly mandating that researchers make their data openly available. Failure of researchers to comply was perceived by University administrators as a risk to the researchers' ability to publish research papers and to attract research grants. The potential for serious cases of non-compliance was seen as a risk that research grants would have to be repaid.
- The lack of a platform to make the University's research outputs citable, discoverable and accessible was seen to limit the attention and impact that the University's research could achieve, reducing citation metrics and other research performance measures, and ultimately limiting research income.

Related directly to the implementation of Figshare, the project was intended to retire the University's existing, poorly utilised, metadata-only research data repository. The repository contained and published metadata describing research data, but not the research data itself. This metadata function would be supplanted by Figshare, hence the decision to decommission the platform.

The project's next objective was to move data management planning from the existing Word template to an online tool. This was intended to reduce the effort required for researchers to complete research data management plans.

In addition, from the perspective of University administrators, tracking completion of data management plans and compliance with policy requirements was impossible prior to the project. These issues aligned with intelligence from other Australian Universities about low rates of data management planning, and that planning was not necessarily delivering improvements in actual data management practice. Implementing a new planning tool was intended to add compliance monitoring functionality.

Once the project commenced, the understanding of research data management planning broadened from this compliance-oriented viewpoint to include provision of value to researchers. This was a direct effort to change researchers' perceptions that data management planning was an administrative overhead and not useful in their context. Value would be provided by various means, including:

- integration between the research data management planning tool and other systems to reduce the effort required to complete a data management plan and push it automatically through required workflows
- automated provisioning of data storage
- training and support for researchers to provide guidance on good data management practices and improve awareness of data management tools and processes at the University.

The means by which these project scope changes, and the scope changes discussed immediately below, came about and were managed during the project are discussed in the next section, Planning, scope management, and project management.

The decision to include electronic research notebooks in the scope of the project was also taken after the project had commenced. It was found that some research groups had already purchased subscriptions to electronic research notebook tools, or reported that they struggled with generic online collaboration tools that did not properly support researcher needs. Researchers reported poor research efficiency related to the use of paper notebooks and associated labour-intensive processes, as well as difficulties in collaboration, particularly for dispersed multidisciplinary research groups. The decision was taken to implement LabArchives as a university wide electronic research notebook solution to improve this situation and, importantly, to recruit two staff tasked with driving its uptake among the University's research community.

Finally, the development of online research data management training was another project scope change that occurred once the project had commenced, when it became clear that researchers had a poor understanding of research data management concepts. The choice of online training was significant because this is a way to deliver training and information to a large number of people at scale. Library staff with subject matter expertise in training and the development of training courses and resources played a significant role in this part of the project.

Planning, scope management, and project management

A number of factors fed into planning for the ReDa project, with strategic work at the outset and subsequent work characterised by a strong focus on researcher need and flexibility.

Strategic planning

At the time of writing the University of Adelaide has a Research Data and Primary Materials Policy (University of Adelaide, 2016), but this Policy did not exist in 2015 when University administrators started to see the need for improved research data management practice, and for University systems to support it. The work to draft the Policy was led by the Deputy Vice-Chancellor (Research) and the Library, initially as a risk management response to potential loss of data when researchers left the University and lack of knowledge and documentation around where data was stored. Compliance with the Policy was simply not possible at the time it was drafted, and this was by design; systems and services would have to be built to enable compliance. For example, the Policy requires that Chief Investigators "Prepare a research data management plan for all internally and externally funded research projects" (University of Adelaide, 2016). At the time, there was no system supported or mandated by the University that researchers could use to draft such a research data management plan. This, and the intention for the Policy to drive development of such a system, is made explicit when the Policy states that Chief Investigators must "submit the data management research plan to the University web portal [exact name to be determined once portal created]" (University of Adelaide, 2016).

Also directly relevant to the ReDa project's initial scope, the Policy requires open publication of research outcomes including data where possible. This drove the selection of Figshare for implementation in the project, following a six-month proof of concept.

Drafting the Policy, and the work involving stakeholders across the University to get it ratified, were some of the very first tangible steps towards the ReDa project and the research data management support systems that flowed from it.

The next phase of preparation and planning for the project was drafting Infrastructure Investment Plan (IIP) documents and business cases for the systems deemed to be necessary. There were initially IIPs for Figshare and for an online research data management planning tool. There was no preferred solution for a planning tool at the time, although a Word template had been developed in the interim.

Scope management

In the project’s early stages, team members adopted a design thinking approach, heavily focussed on user need. Formal design thinking was not heavily utilised within the University at the time, and several members of the project received training to make this approach possible. The Project Manager, Business Analyst, and Change Manager in particular consulted with researchers in one-on-one interviews and in project reference group meetings about research data management problems they faced. This identified a number of issues which shaped subsequent thinking. They are presented below, along with the project scope changes they prompted.

Issue identified during consultation	Resulting project scope change
Many researchers and HDR students did not have a good understanding of research data management concepts.	Online research data management training
Research managers and supervisors of higher degree by research (HDR) students had little or no visibility of where data, for which they were ultimately responsible, was being stored and how it was being managed. They also reported difficulties with collaboration and efficiency issues.	LabArchives
Researchers did not have a good understanding of storage options and data management tools available at the University.	Automated data storage provisioning within the data management planning tool
Researchers perceived a lack of good data storage options.	Automated data storage provisioning within the data management planning tool Also, provision of actual data storage, although this was not part of the ReDa project
Many researchers felt data management planning had little value and the Word template available at the time took significant effort to complete.	Many of the specifications for the online research data management planning tool, particularly measures to make the tool as user friendly as possible. This includes integration with Research Master to facilitate as much pre-population as possible and prevent duplication, and with HPECM for automated record-keeping.

Automated storage provisioning from within the data management planning tool was seen as a value that the tool would offer researchers, as opposed to a compliance overhead. Unfortunately, this was ultimately not achieved because the preferred data management planning tool solution did not become available in time, and ITDS did not have a clear future direction for data storage technology, which made the value of investing in an automated solution questionable.

The University's IIP and business case process was used to specify and win funding for these changes to the project scope.

Project management

Daily fifteen-minute stand up scrums was used for project management. This resulted in flexibility which was very effective in the changing circumstances that surrounded the project, discussed below, and the scope changes discussed above. It also resulted in close engagement between project stakeholders, particularly ITDS and the Library, who were engaged in discussion at least every day in stand-up meetings and in other project meetings.

Change management

Change management, using formal change management techniques and processes, was possibly the most significant element in the project's success. In this context, "change management" means organisational change management, the people side of change. The ReDa project took place at a time shortly following the decision from the CIO that change management was a mandatory and important element in all projects run by ITDS. The ITDS Program Manager responsible for research-related projects had hired a Change Manager for projects prior to the ReDa project, and that initial Change Manager was the first to work on the ReDa project, including working on the IIP bids that led to it.

As the project got underway the Change Manager worked with the Project Sponsor, the Pro Vice-Chancellor (Research Operations), to ensure he understood his role in the project, and what was expected of him. This ensured the Project Sponsor was visibly active throughout the project, and seen to be involved. The Project Sponsor led reference group meetings and made sure all contributions made in the meetings were valued and seen to be valued. The Project Sponsor's name went out on project communications, following the principle that change management staff should ideally be invisible outside the project, but the Project Sponsor's voice should be heard.

The implication of this strong representation by and from the Project Sponsor was that he needed to be convinced of the project's value, and of the value of the systems and solutions that were intended to be shipped by the project. Maintaining the relationship with the Project Sponsor and convincing the Sponsor of this value was a change management task.

A significant outcome of change management in the project was that it brought a strong focus on the benefits for researchers – what's in it for me? The project's first Change Manager had previously worked on other research-related projects at the University. If a researcher told him about an issue, he ensured it was dealt with, pursuing it tenaciously within ITDS, Research Services, and with vendors as required and representing researchers' needs. This meant he had existing relationships with and a great deal of respect from researchers at the University. He continued that approach in the ReDa project, going out into the University, consulting researchers, and bringing the resulting information back into the project and advocating for researchers. The Change Manager also used these relationships to drive researchers' engagement with the project through project Reference Groups, allowing the researchers' voices to be heard in the project's formal governance. As a result, the needs of research and researchers were very strong drivers in the project.

Another significant change management success in the project was the LabArchives support provided by two part-time Research Data Outreach Officers. They were responsible for meeting researchers in their own spaces, both "spiritually" and physically, to drive uptake of LabArchives, and were very successful. They were both late stage PhD students, so they could speak the language of the researchers, hence meeting them in their spiritual spaces. In addition, the Outreach Officers met

researchers in their own physical environments (labs, offices, scheduled meetings), which was a way to express that project team members respected and valued researchers' time. It was considered important that researchers took up and used LabArchives, particularly because this has not necessarily been the case for other products previously pushed out to the University. Change management to drive uptake is considered especially important for "opt-in" products. There are effectively no consequences for researchers if they don't use an opt-in product (like Figshare and LabArchives), so if uptake is considered important for those systems it needs to be driven and resources applied to making it happen. Employing the Research Data Outreach Officers was innovative in the context of the University of Adelaide at the time.

The Project Managers on the ReDa project were strong advocates for change management and what it offered the project, and for the skills of the Change Managers who worked on it. This contributed significantly to the effectiveness of the change management on the project, and to the success of the project itself.

Staffing changes

It is felt that the changes to staffing on the project slowed the project down, particularly on decisions to select a data management planning tool solution. Some project funding that might have been made available was reassigned because of the resulting delays. On the other hand, the project has been very successful and the scrum project management approach, where knowledge sharing is intrinsic to project management and execution, is also considered an important part of this success. People coming onto the project learnt very quickly and came up to speed as a result of the knowledge sharing environment. If this had not been the case the staff turnover would have had a much greater effect.

A significant part of the project's success can be attributed to the willingness of the Research Technology Support Team in ITDS to learn what they needed to in order to support users with the systems flowing out of the ReDa project, thus facilitating the transition from the project phase to business as usual even as project staff changed.

Expression of values

The project can be understood as an expression and manifestation of several values held within the University. In its implementation of Figshare, the ReDa project was an expression of the value that University leadership perceives in the principles of Open Access and FAIR (Findable, Accessible, Interoperable, Reusable).

The project also reflected the University's organisational risk management values, in particular through the implementation of LabArchives and the development of research data management training. LabArchives offers lab managers, HDR supervisors, and anyone else with research management responsibilities to have oversight of all information related to the research they oversee. Research data management training is a means to ensure all researchers at the University understand their research data management obligations and the support available to them to fulfil those obligations. This is important in an environment where research funders and publishers are increasingly insisting on good data management practice. Through its focus on training HDRs, and making this training a voluntary component of the Core Component of the Structured Program that all PhD students must pass, the project was also an expression of a perception of HDRs as agents of change, as opposed to trying to change entrenched research data management practice among late career researchers.

The project was an expression of the perception that it is important to provide value to researchers. As discussed above, researcher need was at the heart of planning and change management in the project. Active steps were taken to understand researcher need, and significant changes in project scope were planned for and executed as a result of the information and feedback received from researchers.

Success was celebrated on the project. One person's success was celebrated by the whole group, and this engendered a strong camaraderie within the team. Real mutual respect was displayed in the project, between all staff members. The project felt like a safe space. Disagreement happened, but it was never personal. This feedback from project team members can be understood as an expression of a real desire for success of everyone involved in the project.

Impact of the project on library services and systems

Liaison Librarian upskilling program

The systems flowing out of the ReDa project, and the need to promote them and support researchers in using them, has impacted the work of the team of Liaison Librarians. The library-based members of the project team took active steps to manage this impact and mitigate the associated risk by planning and participating in a program of training to upskill the Liaison Librarians. The program was endorsed at the highest levels of the Library.

This program featured twelve training sessions between December 2018 and February 2019, scheduled weekly at the same time and place for consistency and continuity. Directly relating to the ReDa project, the program featured sessions on the University's research data management policy and the broader research data management context, and hands on training in Figshare and LabArchives. The aim was to ensure the Liaison Librarians felt confident to respond to initial queries from researchers about the research data management systems, and knew where to direct more detailed queries. The Liaison Librarians also received training in other systems not directly related to the ReDa project.

Subject matter experts in the Library developed a research support brochure to help the Liaison Librarians understand and support all the relevant research-related systems. Liaison Librarians were listed as contacts for information about the systems and the brochure provides tangible support for Liaison Librarians in their interactions with researchers.

Training

The online research data management training developed in the project added an extra element to the Library's training and research support offerings. Importantly, it operates at scale and does not take up the time and resources that delivery of face-to-face training for all researchers and HDRs would require.

At the time of the project all new projects involving ITDS were required to have a training component as part of the proposal and budget submission. The form of the training was not mandated, but some training had to be developed to support new systems. As a result, the online generic research data management training discussed above was developed, as well as training for Figshare and LabArchives users.

Completion of the online research data management training is not mandatory for HDR students, but it is mandatory for HDR students to submit a data management plan in the first six months of their candidature.

The project engaged with the Adelaide Graduate Centre, the University department responsible for management and administration of research education. This led to a decision that the online course should include an assessment piece, and this made it possible to measure how well students had engaged with the course.

On the job skills development

Library staff directly involved in the project learnt a great deal. In addition to the specific research data management aspects, they learnt about project management and collaboration tools such as jira, slack, trello, wikis, scrum methodology, the concept of business owners and administrators, and the concept of automated reporting out of systems. ITDS staff welcomed representation from the business on the project, reflecting previous difficulty in getting business representation and business owners. ITDS staff also appreciated the contacts with researchers and input from “the real world” that the Library staff contributed.

Lessons learned

The work of the Research Data Outreach Officers was critical to the success of LabArchives, and could have been just as effective with the other systems implemented in the project. This approach is recommended in any situation where a new opt-in system is implemented. In this project, related to research, the recruitment of late stage PhD students was very effective.

Engagement with Research Services is very important when implementing systems that intersect with existing processes that they manage. They are important, high interest, high influence stakeholders, and need to be engaged appropriately for best results.

What's next

In the early days following the project's completion, an important next step is to bed down support for all of the systems implemented in the project, and ensure it is ongoing and fit for purpose. This includes consideration of whether or not ongoing promotion is desirable, and for which systems.

Research Data Planner

One next step for Research Data Planner is to work through the small remaining development backlog. More important and significant tasks include developing closer integration with Adelaide Graduate Centre processes, and working with Research Services to start to define what quality looks like for the University's research data management plans, how to audit that, and what compliance monitoring looks like.

Figshare

Ongoing work is needed to fully specify the University's, and particularly the Library's, institutional repository service and Figshare's place in that service. This is in a context where the University ratified an Open Access Policy in the weeks directly following the project's conclusion, and where the FAIR agenda is becoming increasingly important. Consideration also needs to be given to curation of Figshare items: is it necessary and, if so, how will it be resourced?

LabArchives

The Library is the business owner for LabArchives, but this is not necessarily the best fit. A decision may be required about which part of the University is best placed to support it.

Online training course

The course needs ongoing maintenance to ensure it stays relevant and helpful in the context of changes to the University's research data management ecosystem. It is possible that the course may be made compulsory for HDR students, and this will require careful consideration. The role of face-to-face research data management training also requires ongoing thought in order to balance the comparatively heavy consumption of time and resources in its preparation and delivery against its benefits for attendees.

Impact of the project on university research and on the university as a whole

As discussed, the University's Research Data and Primary Materials Policy was initially drafted as a risk management approach to potential loss of data when researchers leave the University, and lack of knowledge and documentation around where data was stored. Related to this, the systems developed in the Project represent a shift towards a compliance-oriented view of research data management, where managers and administrators have visibility on research data and how it is managed. Putting the data management planning tool online, and the consequent capacity for administrators to search the content of data management plans and generate reports were seen as part of the management approach to the same risks of data loss. It did not come to fruition in the project, but automated storage provision was also seen as part of this risk management; automated provisioning would have meant that administrators knew exactly where data is stored.

The project's outputs represent moving with the times, moving into the digital world from a paper-based environment (hardcopy lab notebooks to LabArchives), and moving from a single purpose tool to a tool that offers more value (Word template to online planning tool offering reporting and a lot of pre-completion as a result of integration with other systems). Figshare represents a shift towards a view that research data should be findable, accessible, and reusable, or FAIR.

The project represents a significant step forwards for the University, but ongoing work is required as the expectations and norms around managing research data continue to advance.

References

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