FROM METADATA STORE TO MULTIFUNCTIONAL RESEARCH TOOL: HOW COLLABORATION IS RESHAPING RESEARCH REPOSITORIES

ABSTRACT

At the University of Western Australia (UWA) the Research Repository was initially developed within the University Library as a tool for capturing and making available specific collections of UWA research outputs. It functioned as an end to itself as opposed to existing within a broader research life cycle and therefore the relevancy to the research community was limited. Since the implementation of the repository there has been a growing focus within the national research assessment process on demonstrating the societal benefits and quality of publicly funded research. These developments presented the University Library with new challenges and opportunities to repurpose the research repository to support the University in this new environment and reposition it to become a more integrated presence in the research life cycle. Achieving this required identifying and building relationships with key stakeholders involved in research support and a collaborative approach to developing and expanding the role of the repository. This paper will focus on how the repository was repositioned to fulfil a broader role in the University's strategic research priorities and the forms of collaboration that were undertaken to achieve this.

This paper is a case study of how the UWA Research Repository was transformed from essentially a metadata store to a new system delivering researcher profiles,

open access content, grant information, student supervision data and altmetric tools. It also focuses on the forms of collaboration that were involved in achieving this such as staff swaps, knowledge sharing, taking on new roles and non-traditional Library tasks, joint projects, and formal meetings.

We analyse the original research repository project documentation and key stakeholder interviews in order to assess how the UWA Research Repository evolved through engagement with other areas in the University.
The collaboration and subsequent expansion of the repository model resulted in the Library and the repository moving beyond their traditional roles of simply providing storage and access to research publications. The resulting UWA Research Repository is relevant and has the buy-in and support of other departments on campus.

As a result of this experience, the Library now also provides services and support of recognised strategic importance to the University in areas such as research publication collection and assessment and altmetrics, and is often invited to collaborate on new research support initiatives on campus.

Whilst national developments were the main drivers behind the need to expand the role of the UWA Research Repository, it was really the local collaboration and co-operation that resulted in its success and propelled the Library and repository in new and exciting directions. The UWA Research Repository is now seen as a solution on campus and the Library as a key partner in fulfilling the University's strategic

priorities for research. The UWA experience is an example of how collaboration can ensure a repository not only meets its goals, but exceeds them in unexpected ways.

Executive Summary

This paper is a case study of how the UWA Research Repository was transformed from essentially a metadata store to a new system delivering researcher profiles, open access content, grant information, student supervision data and altmetric tools. It focuses on the forms of collaboration between the Library and the Office of Research Enterprise that contributed to this such as staff swaps, taking on new roles and non-traditional Library tasks, joint projects, and formal meetings. This case study shows how local collaboration and co-operation repositioned the UWA Research Repository to fulfil a broader role in the University's strategic research priorities.

1. Introduction

Research repositories have been a part of the Australian academic library landscape for well over a decade. All Australian Universities either had one or were in the process of implementation by mid-2006 (Henty, 2006) and approaches to the implementation and management of these tools have varied significantly between institutions as have the levels of success these tools have had in securing support, acceptance and usage (Kingsley, 2012).

Many of the repositories in Australia were developed as a result of a combination of internal and external drivers. For some institutions, the external impetus for the development was related to forging a strategy to deal with the ever increasing subscription costs to journals and a philosophical support of Open Access (Simons &

Richardson, 2012). External drivers included government funding under the Australian Scheme for Higher Education Repositories (ASHER) to prepare for the Research Quality Framework (RQF) which allowed all Australian universities to develop their own repository (Australasian Open Access Support Group, 2013). More recent drivers have included the Open Access mandates introduced by the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC) and the increasing expectation that publicly funded research should be freely accessible and able to demonstrate quality and value for investment.

Several case studies have outlined how libraries have collaborated with their institution's research offices on developing and delivering research support services (McCutcheon, 2016). The literature suggests that the majority of such collaborations have focussed on government assessment activities, developing research data and bibliometric support services and the importance of upskilling librarians to develop these research services (Keller, 2015; Searle et al., 2015; Simons & Richardson 2012). However there has been little research done on how internal collaborative activities have influenced the development of research repositories within Australian universities. This paper uses the University of Western Australia as a case study to explore how collaboration influences the development of research repositories. We argue that collaboration driven at the executive level of the Library with the Office of Research Enterprise was a key factor in facilitating the UWA Research Repository to be redeveloped in a way that ensures it is much more integrated in the University's strategic research support agenda compared to the previous repository.

2. The UWA Research Repository replacement project

Academic libraries are in most cases the business owner of research repositories in Australian universities (Council of Australian University Librarians, 2014, p.9) with only 7% of repositories being a shared responsibility between the Library and University's Research Office.

The repository experience at UWA was no different to the national trend with the UWA Research Repository (henceforth, the Repository) being initially developed within the Library[1]. In 2012, the University of Western Australia embarked on a project to replace its existing repository platform, DigiTool with a new system (University of Western Australia Information Services, 2012). The initial driver for this was notification from the vendor that it would no longer be developed or supported and a growing need to re-evaluate the Repository's effectiveness in the University. At the time, the Repository was a Library-managed system and service and contained a small proportion of the University's publication records of which a very small number contained full text that was free to access. As such, the project to replace the Repository began with only Library involvement. This included the stages involving business requirement gathering, planning and selection and acquisition of the system. As outlined later in the paper, this changed and the membership broadened to involve another key stakeholder, the Office of Research Enterprise.

Pure was selected as the replacement for the existing Repository in early 2013 and work commenced on implementing it. Despite Pure being chosen as the platform for

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[1] The University of Western Australia Library was part of a combined division, Information Services consisting of the Library and Information Technology Services from 2010 until September 2014 when the University Library was re-established as a separate division. For the purposes of this paper, the term 'Library' is used regardless of the divisional name at the time.

the new repository, this was actually one of many functions it could perform as it is a Current Research Information Management System (CRIS). A CRIS enables users to collect a wide range of information about an institution's research activity by integrating with other enterprise systems such as human resources, student records, grants databases, indexing databases, publication databases, repositories and webpages (JISC, 2016).

The initial focus of the Pure implementation was on reproducing the functionality of Digitool as a metadata and open access repository for University publications. However, as the project progressed and the Library gained a greater understanding of both the needs of the Office of Research Enterprise and the capabilities of the system, the scope of the project was broadened to include the provision of researcher profiles, linked grant information, and student completion data.

In addition to this, a number of related projects were identified and initiated in conjunction with the Office of Research Enterprise to further develop the Repository service. These included the implementation of the altmetrics service, PlumX into the Repository to assist in the measurement of research engagement, a project to investigate the delivery of the University's open access research data via the Repository, and a project to investigate the consolidation of research publication collection into the Repository. By the end of 2016, it is envisaged that the Research Repository will be the University's central tool for collecting and providing access to research publications metadata, open access publications, research data and altmetrics.

While most of the literature on repositories has focused on prevalence (Kingsley, 2009; Pinfield et al., 2014), challenges and barriers of populating them with content (Davis & Connolly, 2007; Kingsley, 2012) and pros and cons of open access (Swan, 2010; Harnard et al., 2008), this paper will focus on the role of collaborative activities in the development of repositories.

3. **Collaborative Activities during the Project**

During the time span of the project, the Library engaged in a series of formal and informal activities with other sections of the University. Some were directly related to the project and others were not. However each of these activities impacted on staff involved with the Repository and the direction that the Repository project took. As such these collaborative activities are detailed below.

3.1 Project meetings

A project board consisting of senior managers from the Library was established to manage the project in line with Prince2 methodology and the group met in formal meetings as required to make key decisions about the project. However as it became clear that the project and related decisions would impact areas within the University beyond the Library, the membership was extended in late 2013 to include a senior staff member from the Office of Research Enterprise[2] ensuring that this important stakeholder's perspective was included in decisions and discussions going forward. Business requirements from this area were then added and implemented via the project board meetings.

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[2] In 2015, the Office of Strategy, Planning and Performance was formed at UWA and incorporated a number of functions and staff from the Research Assessment Unit in the Office of Research Enterprise. For the purposes of this paper, 'Office of Research Enterprise' is used to refer to both sections.

A project working group consisting of subject matter experts (librarians) and technical leads was also set up. The project working group developed the initial current and future business requirements from an Institutional Repository Review completed as a joint project with the University of Melbourne (University of Melbourne & University of Western Australia, 2012). They met weekly and collaborated closely with the vendor to deliver the key work packages in the project.

3.2 Formal and informal meetings

In late 2014, an additional regular meeting was set up between the Office of Research Enterprise and the Library. This meeting was attended by the heads of the Library and Office of Research Enterprise as well as senior staff from other areas. While informal in nature, it provided a much needed regular communication channel to discuss issues and upcoming developments that were of shared interest. Despite Pure going live in February 2015 and the project officially ending later that year, ongoing work and development continues in Pure and is guided by these meetings.

3.3 Functional role change

During the time of the project, an independent review carried out at UWA identified some overlap of tasks between the Office of Research Enterprise and the Library in the collection of publications and support for bibliometric analysis. Prior to the review, the Library had been collecting publications in the Repository to help fulfil open access mandates and also providing a research impact service to academic staff. The Office of Research Enterprise had been collecting all of the University's research publications annually in a different in-house system for government

reporting through the Higher Education Research Data Collection (HERDC) and Excellence in Research for Australia (ERA). As a result of the overlap identified in the review, a decision was made to formally change the responsibility for these tasks so that the Library would collect all research publications for the purposes of government reporting and open access mandates and Office of Research Enterprise would be responsible for all aspects of the Library's existing Research Impact Measurement Service.

3.4 Staff secondments

Staff from the Library and Office of Research Enterprise were seconded to each other's areas to provide support during the transition phase of the role change. Library staff were mainly tasked with preparing the publication collection for the 2015 ERA which at the time was managed by the Office of Research Enterprise. As a result they became familiar with the auditing processes and system used to collect publications for both HERDC and ERA.

Staff from the Office of Research Enterprise were seconded to the eResearch Unit within the Library to support and perform the 2015 HERDC publication collection. They also became familiar with the Repository and the additional requirements for open access processing.

At the end of the secondments, most staff returned to their substantive role in their original teams however one staff member transferred permanently over from the Office of Research Enterprise to the Library.

4. Stakeholder Interviews: Methodology

The authors sought to determine the extent to which collaboration and communication with other areas of the University impacted on both the current and future directions of the Repository and the individuals and areas involved in the project and activities. They were particularly interested in the period after the Office of Research Enterprise joined the project board in late 2013 and the increase in collaborative activities and communication that followed. In order to conduct a case study of these activities and their impact on the development and implementation of the Repository, key stakeholders were identified and interviewed who had been directly involved either as a participant in the project or a participant in a related activity such as the staff secondments, role change or meetings.

Eleven semi structured interviews (Dunn, 2010) were held with stakeholders and the sample included senior leaders, project team members and Repository and research services support staff. Two interviewees had been involved in the project from the beginning but it should be noted that several staff who were involved have now left the University and were not interviewed.

The interviews focused on the collaboration between two areas (University Library and Office of Research Enterprise) of the University throughout the implementation of the Repository. The questions were grouped in themes covering the interviewee's general relationship to the Repository, the Repository and the research environment, changes resulting from the Repository and the research lifecycle and the Repository.

Questions were asked slightly differently depending on the interviewee's responses and/or position within the project.

All interviews were transcribed by the authors and then coded for common themes following Cope (2010). Minutes, agendas and emails relating to the project were also examined for evidence of the changes as well as confirmation (or not) of the responses received from the interviewees.

5. **Stakeholder Interviews: Results and Discussion**

The findings are presented and discussed in reference to the observations from the analysis of the interviews as well as descriptions of the collaborative activities which occurred during the period of the project. The observations can be summarised in four main themes, the Repository's impact on the relationship between the Library and the Office of Research Enterprise, the changes that resulted from increased collaboration and communication, the importance of early identification of business requirements and the future directions for the Repository and collaborative relationship.

5.1 The Repository and the relationship between the Library and the Office of Research Enterprise

Interviewees were asked to consider changes resulting from the Repository and share their views on the Repository's role in facilitating the links between the Library and the Office of Research Enterprise. It became apparent from the responses that the Repository was not the main reason for increased interdepartmental communication and collaboration during the period covering its development and

implementation. Interviewees mentioned a number of external and internal factors that they felt were key drivers in the establishment of the formal and informal meetings that were set up in the later stages of the project.

Now, that isn't downplaying the role of the Repository project in fostering the relationship but I think the establishment of the relationship itself doesn't just come from the Repository project, it's a deliberate strategic intent on behalf of the Library in that we will collaborate with other areas (Senior Leader, University Library)

The secondment of Library staff into ORE to help with the ERA was great and we worked together fairly closely on the ERA. I don't think this project made much of a difference, I think [the links between the two areas] would have started to happen anyway (Senior Leader, formerly Office of Research Enterprise)

As well as the changing strategic priorities and ERA secondments mentioned above, other interviewees mentioned the functional review of systems and processes and structural departmental changes as having been other factors that contributed to the development of a more strategic collaborative approach through the formal and informal meetings that were set up in the later stages of the project.

However, interviewees felt that the Repository project benefited from this strategic collaborative approach and was a major factor behind the strengthening of the relationship and development of ongoing engagement. This is demonstrated in the following quotes from senior leaders from both areas:

We weren't necessarily involved in the choice of Pure but actually it has come around to be one of those things that have really cemented the relationship with the Library…a concept of continuing engagement between both of our offices and the repository was a catalyst to happen… (Senior Leader, Office of Research Enterprise)

I think it's helped us identify opportunities where we can actually work together and deliver a better service…it's opened up all of those communication channels so that we're a lot clearer on what we're all doing. (Senior Leader, University Library)

A general structural change occurring within the Australian university sector is driving the need for libraries and research services to work together much more closely. At UWA, the historical division between these areas needed to be overcome and the interviews reflect that this was able to happen in part through the Repository project.

5.2 Changes resulting from increased collaboration and communication

Three main themes emerged from the responses to the questions around the impact of the collaborative activities on the Repository. According to interviewees, the collaborative activities resulted in a change in scope and direction for the Repository, the development of cross-departmental awareness, and further collaborative opportunities.

A change in scope and direction for the Repository

When asked to consider the national research landscape, interviewees felt that open access and the mandates issued by the Australian Research Council (ARC) and

National Health and Medical Research Council (NHMRC) were the most significant changes to occur in recent years. In fact, fulfilling open access requirements and improving discovery and research exposure were the two main objectives detailed in the original Repository project documentation (University of Western Australia Information Services, 2012). However, as the project progressed, open access became just one of many factors influencing the development of the Repository. When asked to reflect on changes to the Repository throughout the project, all three staff involved since the early stages of the project spoke about this change in scope and direction:

It started off all about the publications and then it's grown… (Project Manager, Business Information and Technology Services)

I think the scope has widened a lot…all we were supposed to be doing in this, especially when we had like Pure was just to have an open access repository. (Technical Lead, Business Information and Technology Services)

We ended up with a CRIS even though this was not what it was assessed for… (University Library staff member)

These interviewees compared the current Repository to the original project aims and felt that the change in direction was a result of the collaboration that occurred once the Office of Research Enterprise joined the project board and the Library began to address their business requirements which included streamlining the research publication collection process, consolidating grant and award information across the

University and providing tools for researchers to measure engagement with their research outputs. They felt that the original project aims were to implement a publications-based system and that the Repository had begun to emerge as an integrated research management system due to the fact that the Repository now includes altmetrics by PlumX and is being prepared to integrate with the UWA grants database.

There was a general feeling that the Repository is finding relevance within the broader research lifecycle at UWA having moved beyond its original aim to simply provide a mechanism for compliance with open access mandates.

The development of cross-departmental awareness

The individuals interviewed as part of this case study had all been involved in the Repository in varying capacities and at different levels and stages throughout its development and implementation. As to be expected, when asked about the activities they felt most contributed to the development of the Repository, interviewees generally spoke about the activities they had been directly involved in. The senior leaders spoke about the formal, strategic meetings and the research support services staff mentioned the staff secondments and functional role changes as having had the most significant impact. However, both groups felt that the project board and team meetings were instrumental and that the collaborative activities were supported by extensive documentation and implementation of policies.

Changing understandings of roles and functions

Despite the staff secondments between the Library and the Office of Research Enterprise being unrelated to the Research Repository project, research services support staff from both areas felt they gained a better understanding of the other areas' work and the aims of each section:

A lot of Library staff came over and were quite integral to ERA15 which was great and then that means that when staff went back to the Library they could take that information back…and share that so that everyone has a wider understanding of what ORE does and vice versa as well. And ORE knew what the Library did in terms of the Research Repository, what open access really meant, what the mandates are… (Staff member, formerly of Office Research Enterprise)

By swapping the roles we are more aware of what they want, what they use our information for…so we can tailor it better… (University Library staff member)

As shown above, the staff secondments not only helped the Office of Research Enterprise staff gain a better understanding of the aims of the Repository project and what it was trying to achieve, but Library staff also became more aware of the purpose of the Repository and its role in the wider research lifecycle at UWA.

Changing personal views and understandings
A number of interviewees from the Office of Research Enterprise also reflected that their personal views on both the role of the Repository and the Library had changed over the course of the project:

I thought a lot of things that came from the Library was all about more student driven, whereas my time with the Library and my experiences so far it's more about academics and researchers, it's very much about providing services to them…(Staff member, formerly of Office of Research Enterprise)

I've actually really come to understand that librarians are much more multi-skilled than I had thought of…and the traditional librarian role has changed significantly so I have a greater awareness and appreciation of what you guys do. (Senior Leader, Office of Research Enterprise)

As shown by the responses, the main themes were around a better understanding of the function of the Repository and a better appreciation for the research support offered by the Library and its strategic importance in the provision of research services and infrastructure at the University. Interestingly, a number of Library staff reported that their views had also changed as a result of the increased collaboration with the Office of Research Enterprise:

…certainly opened my eyes to the real potential that the Library has to help to support a much greater part of the research lifecycle. Having that relationship with the Office of Research Enterprise has helped because I think they really have helped us understand what the key issues are for researchers and the context of research. (Senior Leader, University Library)

As shown by the quotes, while Library staff were confident in their understanding of the Repository function, they were also enthusiastic about new possibilities and

potential for the Repository that they felt had come about through the various collaborative activities.

Further collaborative opportunities

The relationship that was fostered and strengthened between the various areas during the Repository project not only led to new opportunities for the Repository, but also presented further opportunities for the areas involved to develop and collaborate on new research support initiatives. Interviewees mentioned the decrease in the duplication of effort through centralisation of research publication collection processes, a joint approach to Qualtrics support and participation in the annual UWA Research Week, as having been incidental benefits.

5.3 The importance of early identification of business requirements

Despite starting as a predominately Library project, the increasing collaboration and communication resulted in it becoming very much a joint project involving ongoing development of Pure according to the business requirements of both sections. A number of interviewees reflected that the clarification of business requirements and scope that took place at a later stage of the project would have been beneficial during the establishment of the project:

> *Collaborating with the Research Office emphasises the benefit of collaboration at an early stage and we're seeing that with ORCID and a few other projects that we're working on…when we are all involved upfront, we all understand what we're doing, we agree on what the scope is and we all sponsor the project together…leads to a much better outcome.* (Senior Leader, University Library)

…we knew that they wanted to use it but perhaps if they had been involved from the beginning in setting up specs…because the relationship has been set up…there is a lot more scope now. (University Library staff member)

Even though these interviewees felt that it takes longer and is much more complicated to consider and address the requirements of different areas and functions, they felt that when this occurred there was a shift in the project and the Repository began to become more useful for the UWA community.

5.4 Future directions for the Repository and collaborative relationship

Despite interviewees being from three different areas of the University with different responsibilities and functions relating to research support, a number of themes emerged in interview responses around the future directions for the Repository. When asked what they felt would be the most important changes needed in the Repository over the next five years, interviewees were consistent in their vision for ORCID integration, research impact support and further automation in the Repository and this reflects the shared strategy for research support that has been developed amongst the areas. Current internal drivers such as the University's Enterprise Architecture framework which is under development and a project looking at developing a single source of truth for current students, future students and alumni were also mentioned as having potential impact on the future development of the Repository. UWA will also be a test site for the impact and engagement pilot assessment in 2017 and the Library has been asked to be involved due to the potential role that could be played in this exercise by the Repository. The Repository

will therefore continue to be heavily driven by rapidly changing internal and external factors but the shared strategy will ensure the Repository meets the requirements of all areas.

The Repository project did not include researchers on the Project Board as a representative stakeholder group. In hindsight it is acknowledged that this was a missed opportunity considering their perspective and input would have greatly enhanced the Library's ability to ensure the relevance and value of the Repository for this group. Future projects such as the rollout of ORCID and the Research Data Online migration will involve researchers in the project starting from the initial stages. Further research will be carried out to determine how UWA researchers have responded to the changes to the UWA Research Repository and the extent to which the strategic collaboration between the Library and the Office of Research Enterprise has resulted in a useful tool for them.

An upcoming reporting line change, effective 15th August 2016, will bring the Library into the Research Portfolio along with the Office of Research Enterprise, Graduate Research School and Institute of Advanced Studies. A number of the interviewees mentioned this change and felt it would be a positive move:

…will present a large opportunities going forward because [DVC(R)] will essentially be mandated with looking after the infrastructure of the University research infrastructure of which the Library is an important piece… (Senior Leader, Office of Research Enterprise)

…it will further strengthen the relationship…our role in research support and the Repository's role in the University because I think there's lots of positive benefits… (Senior Leader, University Library)

As shown by the responses above, interviewees felt that the move reflected the Library's growth as a key partner in research support at UWA and would build on the shared strategy of research support and vision for the Repository that has been developed through the meetings between the Library and the Office of Research Enterprise. The strategic intent of the UWA Library to prioritise such partnerships is documented in the Library's Strategic Directions document (University of Western Australia Library, 2015b, p.5) and an engagement framework (University of Western Australia Library, 2015a) has been developed to assist staff operationalise these priorities.

6. Conclusion

At the start of this project, the authors aimed to explore the extent to which collaboration between university libraries and research offices shapes the implementation of a repository using the experience at UWA as a case study. The case study presented in this paper shows how strategic collaboration and communication helped to shape the direction and build support for the Repository at UWA and the unintentional benefits that arose including increased cross-departmental awareness and understanding of roles/functions, the development of new research support initiatives and further expansion of the role of the Repository at UWA.

The UWA case study demonstrates the importance of having a strategic, university-wide approach to the implementation of a research repository, identifying key stakeholders, and involving them as collaborative partners from the first conversations around the project. To be effective this collaboration needs to happen at all levels using a variety of formal and informal activities.

Changes in the both the Australian and the global university research landscape have seen a shift towards universities being required to facilitate more active assessment of publicly funded research including improving accessibility to outputs and demonstrating impact and return on investment. This shift has resulted in a need for University departments providing research support to work closely together, rather than in isolation, on cohesive and streamlined tasks, systems and strategies. This case study follows the development of such a partnership at UWA and confirms that a close collaborative working relationship with the Research Office will be essential to ensure Libraries are delivering repositories and research support services which are aligned with their institution's strategic goals.

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