

Evaluating Data Management Plans - Are They Good and Are They Effective?

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Evaluating Data Management Plans - are they good and are they effective?

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Abstract

Since 2014, Curtin University Library has provided support to researchers in using the University's in-house Data Management Planning (DMP) tool. The tool guides researchers through a series of questions on how they plan to collect, store, secure, and share their research data. Creation of the plan is a prerequisite for staff to obtain ethics approval and file storage. Uptake of the DMP has been excellent over that four years, but are the plans good and are they effective?

In 2018, Curtin University Library chose to collaborate with a Masters by Coursework student, Amy Cairns, to undertake a study to analyse the quality and effectiveness of Research Data Management Plans. The core research question was whether Curtin's DMP tool help researchers manage the data they collect. The study involved analysing the extensive dataset of four years of DMPs, and conducting a survey and focus groups with research staff who had used the DMP tool.

The past DMP data provided useful information on which Faculties produced the most DMPs, how many had been updated, storage options, and peak times for creating DMPs.

The survey and focus groups provided valuable feedback on whether the existence of a DMP had improved researcher practices. These activities asked researchers to consider why they completed a DMP, what prompted any updates of the DMP, and if the questions in the DMP had changed practices in how they organised data, stored it, and made it available.

These findings will inform how the Library educates users in use of the Tool and refine other aspects of the research data management service. The practitioner-researcher collaboration between the Library and the research student was mutually beneficial, and we will continue to explore opportunities for similar arrangements in other service areas.

Keywords: Research Data Management Planning; Evaluation; Research Data Management

The Data Management Planning tool

In 2014 Curtin University began using an in-house tool that would enable researchers to more efficiently and effectively create a Data Management Plan (DMP). Prior to this time DMPs were created without a central tool and without detailed guidance. The development of the DMP tool had been discussed since 2010 and significant background work was undertaken over the next few

years, including developing an understanding of the nature of a DMP tool and the supporting documentation that would be required. The actual development of the DMP tool was delayed until resources could be made available but the lack of such a tool had long been recognised as a shortcoming in the University's support for researchers and their management of research data. DMP tool development was led by the University Research Office in close partnership with Curtin's IT Services (CITS) and the University Library, and created in consultation with researchers from all discipline areas. The Research Office was, and still is, responsible for the policy and procedure that guide researchers in managing their research including the planning and management of their research data. CITS is responsible for providing the technical tools and infrastructure required to support researchers in complying with policy and procedure in their research activities, including research data management. The Library is responsible for providing expertise in training and support for researchers in a number of areas, including managing research data, and has taken the lead role in DMP tool training and support for planning research data management, including the publication of a comprehensive guide to research data management [Curtin University Library, 2019].

The partnership between the Research Office, CITS and the Library was a main factor in the successful creation of the DMP tool and that partnership continues to be important for the ongoing deployment of the DMP tool.

The success of the DMP tool can be demonstrated by the number of DMPs that have been developed using the tool and the growth in those numbers since 2014. Table 1 illustrates the overall number (over 6,000) and the growth in DMPs over time.

Cumulative DMP count over time

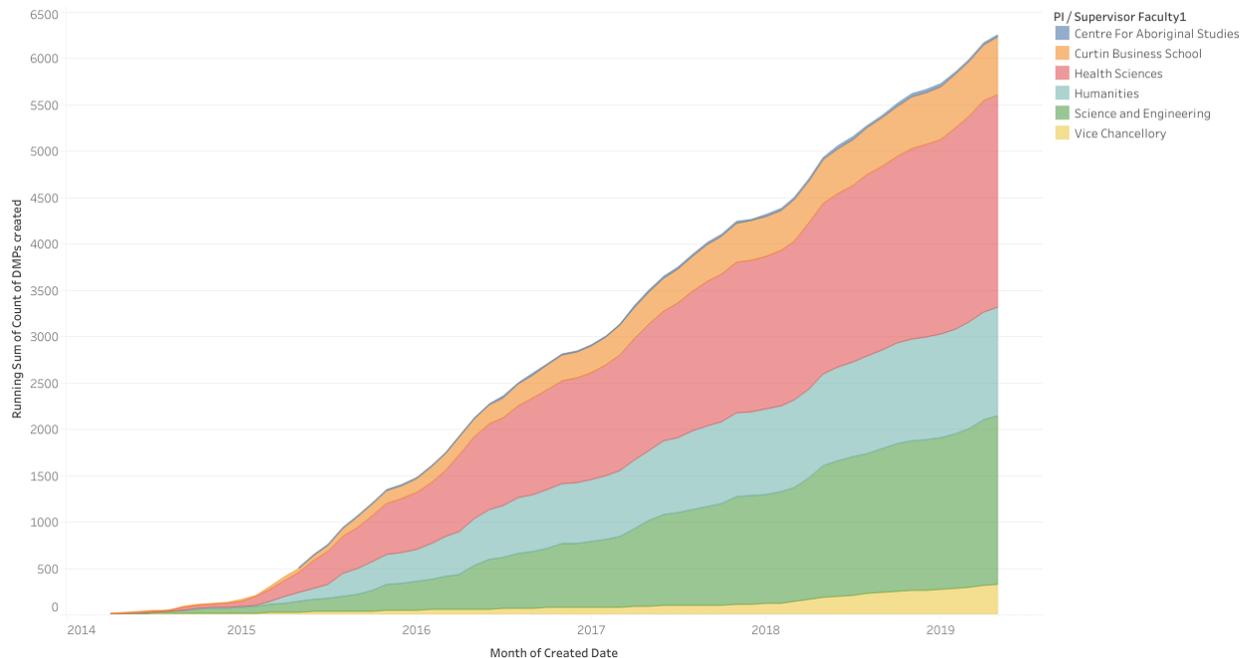


Table 1. Cumulative DMP count over time

Reviewing The Data Management Planning tool

As measured by the large and growing number of DMPs that have been created since its inception, the DMP tool has been very successful. However the number of DMPs does not give an indication of the quality of the plans or how useful and effective they are for the researchers who complete them. The lack of measures other than the number of plans created makes it difficult to evaluate the quality and usefulness of DMPs and without information about quality and effectiveness it is difficult to know if improvements are required and what those improvements might be or indeed if the DMP tool is actually successful.

In late 2016, after more than 2 years of the tool being in operation, it was decided that a DMP tool review was a strategic priority for the Library. The need for a rigorous review focusing on quality and effectiveness would be a significant research project in its own right. The Library had at the same time been considering how to develop more collaborative engagement with researchers outside the Library and this was an ideal opportunity to meet both objectives. The review could be conducted as a research project in collaboration with an academic area of the University. This led to an examination of what sort of researcher and what sort of project would be needed to meet project deliverables.

The Library sought advice in the first instance from the Associate Deputy Vice Chancellor for Research Training. He was fully supportive of the nature of the project and suggested that the research required to evaluate the DMPs was more suitable for a Master's student as it lacked the previous depth of research to be suitable at a doctoral level. This was good advice and clarified the nature of the collaboration the Library would seek.

Curtin University has within its *School of Media, Creative Arts and Social Inquiry* a discipline area of *Libraries, Archives, Records and Information Science* and within that discipline offers the Master of Information Management. The Library approached the head of that discipline area with a proposal for a research project that could be undertaken by a Masters' student under the supervision of the discipline area. This was well received. The proposal was shared with academic staff and Masters students who were deciding on the Masters project that would complete their Masters.

A suitable Masters student, Amy Cairns, who had an existing interest in research data, was put forward. A supervisor, Dr. Hollie White, was enthusiastic about the project and well placed to provide the academic supervision required. All parties discussed the project, the timelines and the outcomes and agreed to take the project forward as Amy's research project for her Masters.

This may all sound straightforward in the telling but the process of investigation, consultation and decision making took most of 2017 and then the Master's project had to fit into Amy's program of study. Hence the research project was not started until 2018, and not fully concluded and written up until later that year.

It is worth mentioning the mutual benefits from this collaboration between the Library and the student. The Library would commit staff time to provide direction and information to the student, and space to work within the library staff area and be available when the student was working in the library on the project. The Library would also facilitate between the student and Research Office in the process to gain ethics approval for the project and to communicate with researchers who had

completed DMPs. For the Library, and indeed the University, the research project would provide valuable insight into current practise in regards to DMPs and give guidance to future development.

It is also worth mentioning that for the student the project needed to be successfully completed to ensure she could meet the requirements of her course and hence graduate. The needs of the student had to be of primary importance and come ahead of the needs of the Library. This was stressed by the Associate Deputy Vice Chancellor for Research Training at the first discussion, and emphasised by discipline area lead. This is an aspect of such collaboration where there are possibilities for conflicting interests and the welfare of the student needs to be given the highest priority. Fortunately the collaboration was well managed by all parties and the outcome met everyone’s needs, with the student successfully completing a Master of Information Management and the Library receiving a research report that could inform future development.

Uptake of the Data Management Planning tool

As shown in Table 1 Curtin University has achieved a large uptake in the use of the DMP tool. It can be seen from Table 2 that there is also a spread of academic staff and higher degree research students who have completed a DMP using the tool. In some areas the number of students exceeds the number of staff and the other way in other areas. Where higher degree research students have completed a DMP they have done so under supervision from academic staff, and this is a practice embedded in the DMP tool.

Total DMP count by faculty and owner type

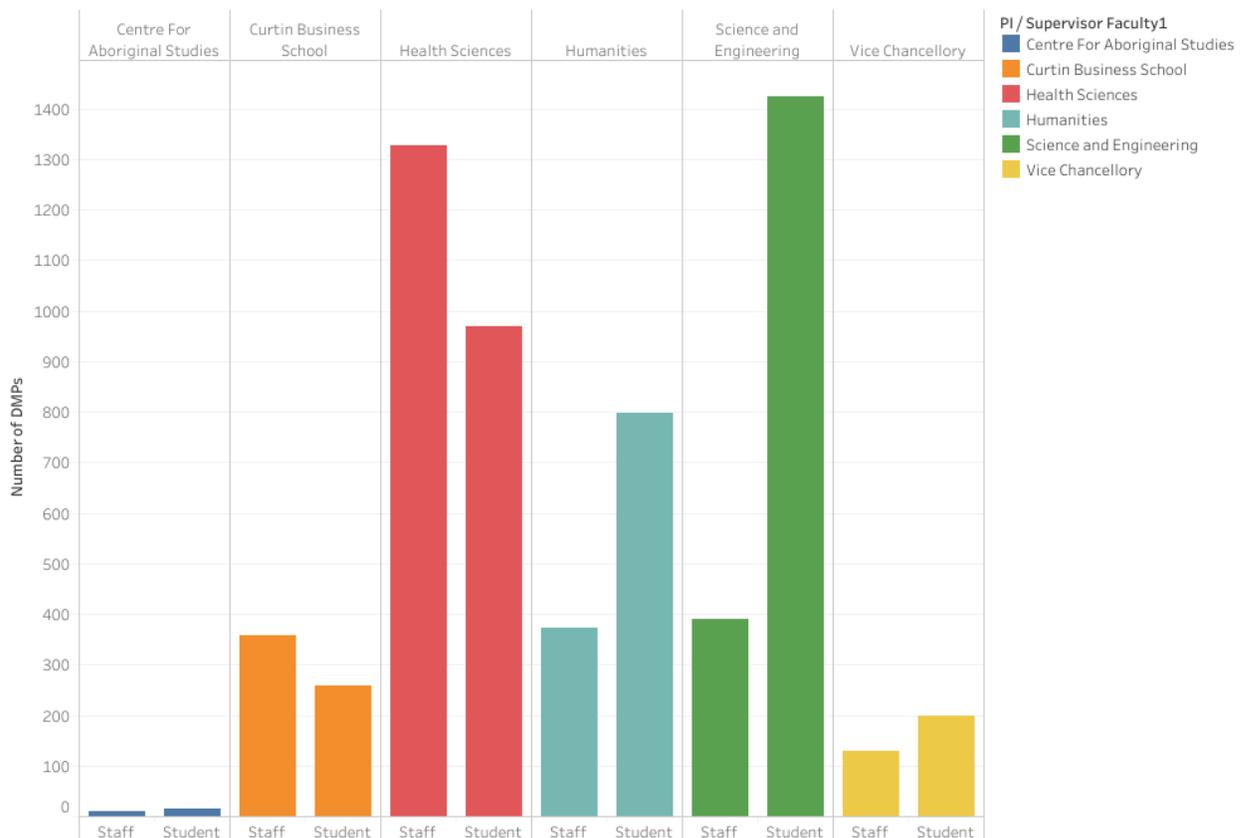


Table 2. DMP count by researcher type and faculty

While this frequency and spread of use may suggest quality and effectiveness of the tool, it is important to understand the various factors that impacted DMP tool adoption.

The first factor is the way in which the university provides storage space for research data (assuming that we are considering digital data as the primary form of research data). Curtin University provides a shared network drive for storing research data. This is scalable according to need, stored securely and can be accessed by all Curtin researchers. However, to obtain an allocated space on the shared network drive the researcher needs to complete a DMP using the DMP tool. The request for storage space is included within the DMP tool. The allocation of storage space is a major incentive for researchers to complete a DMP and to use the DMP tool. Data storage is a reward for completing a DMP using the tool and hence drives some of the uptake of the DMP tool.

The second factor is that researchers who require ethics approval must complete a research data plan using the DMP tool as part of the ethics approval workflow. Ethics approval is required for research that uses human or animal subjects. Hence creating a DMP using the tool cannot be avoided for the large number of research projects that will require ethics approval. This is a significant driver for using the DMP tool.

The third factor is that higher degree research students are required to have a data management plan as part of their candidacy application, and this plan must be created using the DMP tool. The mandatory nature of this requirement ensures that all higher degree research students complete a DMP using the tool. It can be expected that all higher degree by research students will have used the DMP tool.

These three factors are strong drives for researchers to complete a DMP using the tool and are likely to explain the high level of uptake. However the push factors in themselves don't indicate one way or another whether the DMPs produced are of quality or if the production of a DMP is useful. There may be assumptions but no evidence to support a view either way in regards to quality or usefulness. Hence the need for a research project to provide evidence.

Conducting the Research project

The research project, conducted by Amy Cairns under the supervision of Dr Hollie White, with assistance and support from the Library and the Research Office, asked the question, "Does Curtin's data management planning tool help researchers manage the data they collect?" [Cairns, 2018].

To answer this question both quantitative and qualitative approaches were used. The tools included a survey and focus group interviews. The survey was widely reviewed by the stakeholders and revised according to their feedback. The research project needed to obtain ethics approval and storage space, and so Amy was required to do a DMP using the tool at the very start of the project.

It was possible to identify those researchers who had completed a DMP using the tool, as those details were captured within the system and approval was gained for them to be used. The survey

was sent to about 2000 students and 900 staff members from all areas of the University who had used the DMP tool and whose email address was still active in the university system.

The online survey was emailed directly by the Research Office ensuring the survey came from an authority recognised by researchers and that the personal contact details were not made available to the student. The survey was sent in July 2018, and closed in August. Nearly 200 responses were obtained to inform the analysis.

What the Research project found

Not surprisingly the research project confirmed that the main reasons for researchers completing DMPs were those already discussed, mainly University-based policy and procedure that required the tool's use. Researchers identified their reasons for completing a DMP as gaining ethics approval; gaining an allocation of data storage; and completing their candidacy.

Most survey respondents reported that they did not access their DMP again after it was accepted, and made no changes.

However a majority of researchers reported that the DMP was helpful. Given that the main drivers were the mandatory requirements of ethics approval and candidacy or to get access to data storage this is a very positive result.

Researchers reported that doing the DMP prompted them to change how they named and organized their data, how they planned to store and backup their data and how the research data would be made available after their project's completion.

This is a very positive outcome of the DMP process, as the management of research data is complicated and particular to each research project. If the DMP prompts the researcher to consider issues at the early stage of their research, even if their responses might change as they gain more experience of the actual data, then the DMP is serving a useful purpose.

Those researchers who didn't find the DMP useful reported that they already did what the DMP recommended, or that they did not follow the DMP when it came to actual data management or that the DMP was useless, or they could not verify that it was followed.

Outcomes of the Research project

Some suggestions emerged from this research that can be considered to improve the data management planning experience for researchers. First, training and support provided for creating data management plans exist, but researchers indicated confusion in applying the concepts to their actual plan creation. This confusion might be created by having multiple sources of advice, such as the Library, Research Office, Ethics and supervisors. Better coordination between the different parties and more targeted support could improve the data management plans, and the experience.

Second, creating a data management plan is an activity at the beginning of a research project and researchers could benefit from more support in the implementation of the plan over time. The research indicates that for most researchers creating the data management plan is a one-time activity, and moving towards a more cyclic approach to data planning that supports evolution and change as the research progresses would be a better outcome.

Third, researchers indicated that the area in which the DMP provided the least help was in the long term storage of their data. This is an area that could be further developed in the DMP tool.

In addition, one tangential issue discovered through the survey, but of significance to the University, is the relationship between the creation of DMPs to gain access to data storage and the difficulty in using that data storage by the researcher, such as the inability for external collaborators to access; unsuitability for processing data using high performance computing; and difficulty in connecting to a shared network drive from locations outside the campus. It also emerged the DMP may not provide sufficient information about the lifecycle of the data that would assist administrative management of the data storage service over time or if it does then the lack of an integration between DMP and storage system leads to a lack of metadata for managing storage and disposal of research data including a mechanism to indicate project completion.

Conclusion

The implementation of Curtin University's DMP tool in 2014 has made a contribution to improving the management of research data. The integration of the DMP tool into the workflow for ethics approval; allocation of data storage; and candidacy for higher degree by research students has been an outcome of the ongoing collaboration between Research Office, Curtin IT and the Library.

The collaboration in 2018 with a Masters by Coursework student, Amy Cairns, to undertake a study into the quality and effectiveness of Research Data Management Plans provided insight into the motivations and frustrations of researchers and the findings of her report will provide direction to future improvements in data management planning at Curtin University.

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