The Tuuli Project: Accelerating Data Management Planning in Finnish Research Organisations

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Abstract

Many research funders have requirements for data sharing and data management plans (DMP). DMP tools are services built to help researchers to create data management plans fitting their needs and based on funder and/or organisation guidelines. Project Tuuli (2015–2017) has provided DMPTuuli, a data management planning tool for Finnish researchers and research organisations offering DMP templates and guidance. In this paper we describe how project has helped both Finnish researchers and research organisations adopt research data management best practices. As a result of the project we have also created a national Tuuli network. With growing competence and collaboration of the network, the project has reached most of its goals. The project has also actively promoted DMP support and training in Finnish research organisations.

The Tuuli Project

The Open Science and Research Initiative

The Open Science and Research Initiative, set out for the years 2014–2017, is a cross-administrative initiative established by the Ministry of Education and Culture.[1] The goal of the initiative is to promote open science and the availability of research results and information. The objective of the initiative is to make Finland one of the leading countries in openness of science and research by the year 2017 (Tuomi, 2016). Furthermore, the Open Science and Research Initiative seeks to ensure that the possibilities of open science will be widely utilized in the Finnish society. The key actions of the initiative include facilitating common effort by dialogue between stakeholders, building sustainable information infrastructures and promoting skills development on scientist, specialist and managerial levels.[2] The Ministry of Education and Culture is responsible for the overall coordination and funding of the initiative and cross-governmental process. Moreover, the initiative is based on broad-based cooperation between ministries, research institutions and research funders (The Ministry of Education and Culture's Open Science and Research Initiative 2014-2017, 2014).

Organisation of Tuuli Project

As a part of the Open Science and Research Initiative, "Tuuli" is a collaborative project involving universities and other research organisations as well as the biggest research funders in Finland. The domestic developer community is composed of experts from the first phase pilot organisations as well as national research data management expert organisations and projects. There have been over 40 experts from 22 different organisations in the working groups and subgroups of the project. Among these experts are librarians, data curators, information specialists, IT support persons and university lecturers. The project is coordinated by Helsinki University Library until the end of March 2017.[3]

The main task of the domestic developer community has been to provide comments on the specified project plan, concepts, data contents as well as the functionalities of the system. The members of the developer community have also participated in system conceptualisation, implementation and piloting, as well as in the collection of feedback. The developer community has organised workshops and webinars during the project. All the project materials have been published via the project wiki to enable others to follow the progress of the project. Towards the end of the project, the developer community has jointly compiled a plan regarding the ongoing upkeep of the DMP tool.

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1 Open Science and Research Initiative: http://openscience.fi/about
2 Open Science and Research Initiative poster: http://openscience.fi/documents/14273/0/Open+Science+and+Research+Poster/3c890d3c-2b22-4203-8c34-ed902aad64ed
3 DMPTuuli project: https://wiki.helsinki.fi/x/g5w6Cg

The developer community includes four working groups:

- Guidelines group

- User group

- Tools group

- Peer support group

Project coordination is the responsibility of project manager Mari Elisa Kuusniemi (Helsinki University Library), project coordinator Minna Ahokas (CSC), and project secretary Jari Friman (Helsinki University Library).

Organisations involved in the project or organisations following its progress have each appointed a contact person. The contact person is responsible for functioning as a link between the project and the involved organisation. They communicate within their organisation regarding the production of data management plans (DMPs) or to the stakeholders involved in supporting research data management and vice versa.

Project Goals

With growing competence and collaboration of the Tuuli network, the project has reached most of its goals. Firstly, the project has resulted in developing DMPTuuli, a DMP tool offering DMP templates and guidance from research funders and organisations. Furthermore, the Tuuli project has been an active promoter of data management planning training in Finnish universities.

Goals of the project:

- Explore the needs of DMP guidance and training;

- Create DMP guidance to support researchers in adopting research data management (RDM) best practices, and generally spread information about them;

- Link guidance to the research process (via grant application process);

- Help organisations create their own DMP guidance and raise awareness about the need for DMP reviewing and RDM services;

- Develop a DMP tool including necessary templates, guidance and links to support services available in research organisations;

- Create an effective information channel to reach researchers and to inform them about RDM rules, principles and guidelines, and about available services.

The DMP Tool

There were practically two potential DMP tool platforms available: DMPOnline[4], developed by the Digital Curation Centre (DCC), UK, and DMPTool[5] by the University of California Curation Center of the California Digital Library, US. The basic idea of both tools is simple: first choose a DMP template and then the system provides a set of

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4   About DMPonline: https://dmponline.dcc.ac.uk/about_us
5   About the DMPTool: https://dmptool.org/about

questions and guidance (Sallans and Donnelly, 2012). Both tools are still quite young and are developed constantly.

Technical maintenance was purchased from the DCC rather than maintaining an own installation, because the maintenance was outside the scope of the project, and because this was also the most cost effective approach. DMPOnline was chosen primarily because its servers are located within EU. This is essential because research DMPs often include sensitive or secret information. Moreover, setting up meetings with someone within approximately the same time zone is much more convenient. The need for consultation was rather high in the beginning, when the tools were not yet familiar to the local administrators and the service concept was also new to the DCC.

Engaging Researchers

Project Tuuli has a strong user driven approach. Besides research organisations and funders, the project has engaged researchers working in Finnish universities and research institutes. When developing the general templates and guidance, and when preparing for the piloting, the project organised a series of workshops for researchers and research support experts. All guidance and DMP templates were exposed for comments before implementing the tool and before the process was connected with funding calls and grant applications. This demanded close interaction between the project, Finnish research organisations, research funders and the end users, Finnish researchers.

In the first phases of the project, researchers were interviewed about their needs and demands concerning a DMP tool, DMP guidance and training. During this period, 45 researchers from eight different research organisations representing over ten different disciplines (Huuskonen and Soderholm, 2016).

The general DMP guidance was finalized during the spring 2016. During this phase, the Finnish instance of DMPOnline, DMPTuuli, was tested and the general guidance assessed by researchers. Altogether 23 researchers from 11 different disciplines and four different universities (Universities of Helsinki and Turku, Tampere University of Technology and Aalto university) participated in the testing.

According to the user test, researchers were affirmative on DMPTuuli. It was considered as an easy tool to use, which supports researchers especially in the early stage of the research process and helps with funding applications. Two main challenges were identified: how to make the tool an integral part of the research process, and how to make the guidance and the template satisfy most researchers' needs.

Pilots with Research Funders

Piloting started in May 2016 when the research funder TEKES implemented DMPTuuli in their grant application process. The second and more extensive phase of the pilot began in July when the Academy of Finland released their September 2016 call (Academy of Finland, 2016).

The Academy of Finland Call

The Academy of Finland is an agency within the administrative branch of the Finnish Ministry of Education, Science and Culture. The Academy of Finland is the biggest

research funder in Finland supporting and facilitating researcher training and research careers, internationalisation and the utilisation of research results. In 2017, the Academy's funding for research amounts to 437 million euros.

The Academy of Finland's new requirements for a data management plan as a separate appendix were introduced in their autumn 2016 funding call, which was released in July 2016. In the earlier funding calls the applicants were asked to answer Academy's DMP questions briefly in their research plan.

Piloting of DMPTuuli with the Academy of Finland began in July 2016 when the Academy of Finland released their funding call for the autumn 2016. The applicants were asked to draft a DMP according to the structure given in their guidelines or by using the data management planning tool DMPTuuli (Academy of Finland, 2016).

By the end of the Academy funding call, DMPTuuli had over 2,800 registered users and over 2,000 DMPs had been created using the Academy of Finland's DMP template. The total number of applications received in the Academy of Finland's September call was 3,054 (Salmi and Ahokas, 2016).
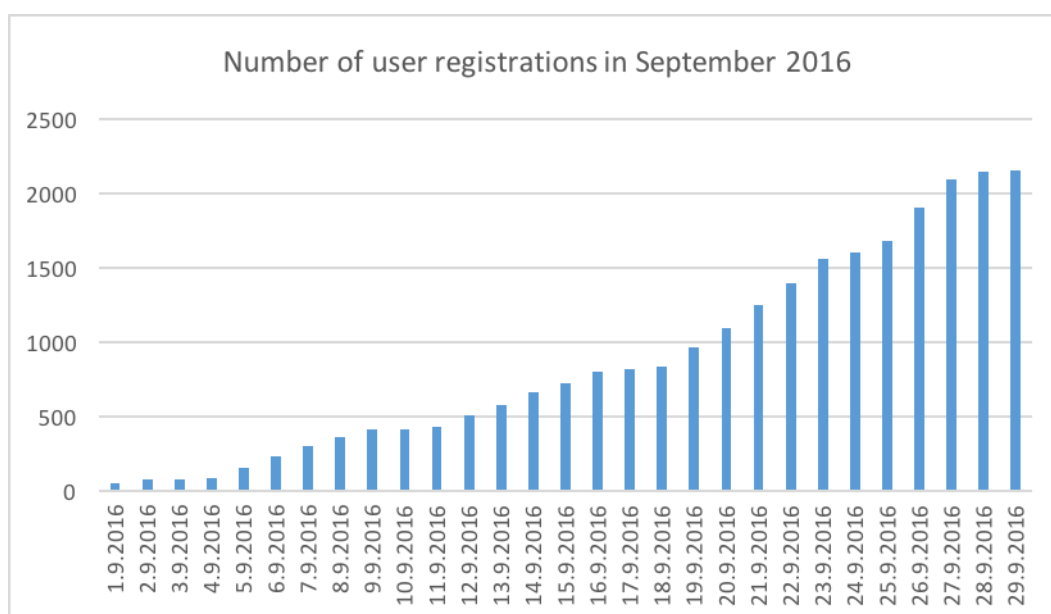
Figure 1. Number of confirmed DMPTuuli registrations in September 2016.

DMP Support

Supporting organisations in building their RDM services is one goal of the project Tuuli. Many Finnish researchers are not familiar with DMPs and organisations have previously provided little DMP support. Although the Academy of Finland has required a DMP paragraph as a part of research plan for several years, it has not become an established part of a researcher's work flow.

Many researchers were writing DMPs for the first time for the Academy of Finland September 2016 call. Their need for information was urgent, not only concerning DMPs but about research data management generally. A national DMP guidance was created in the project and made available in the tool. Need for more practical, organisation or service level information was apparent and this was promoted in the network webinars. Soon after the project had started, many universities created RDM guidance of their

own. The DMP tool offers an effective way to promote these guides to researchers writing their grant applications.

Although the DMP and RDM guidance are essential, it is important to offer additional training and hands-on workshops. Most research organisations in Finland have not had DMP training for researchers before. In webinars organisations were encouraged to organise training. While usually it is difficult to reach extremely busy researchers for training, this time that was not the case. The Academy of Finland emphasized the importance of the DMP by making it as a separate appendix in their grant application, and it was easy to motivate researchers to participate. Workshops were also an important way of getting feedback.

DMPTuuli tool also served as a motivator to take part in a workshop, because it was recommended by the Academy. Many organisations seized the opportunity and had workshops or briefings for researchers. Most common questions raised up in the workshops concerned the following topics:

- metadata and metadata standards

- data storage and archives

- sensitive data or anonymization

- opening and sharing data

- ownership and licensing

Such concerns arising from DMP questions imply that RDM is not yet an established part of a research life cycle in Finland. We are in the process of building the infrastructure needed to manage research data and many researchers are now becoming more aware of the benefits of RDM.

The pilot inspired several organisations to launch a DMP reviewing service, letting researchers have their DMPs evaluated by the library. This is also very effective way to train the DMP support staff (Davis and Cross, 2015).

Taken together, a versatile set of DMP services were established in a short time during the pilot. This was on one the hand due to pressure from the research funders for more comprehensive DMPs, triggered by the project. On the other hand, setting up the services was enabled by the support offered to service providers, such as information about the user needs and sharing best practices within the network.
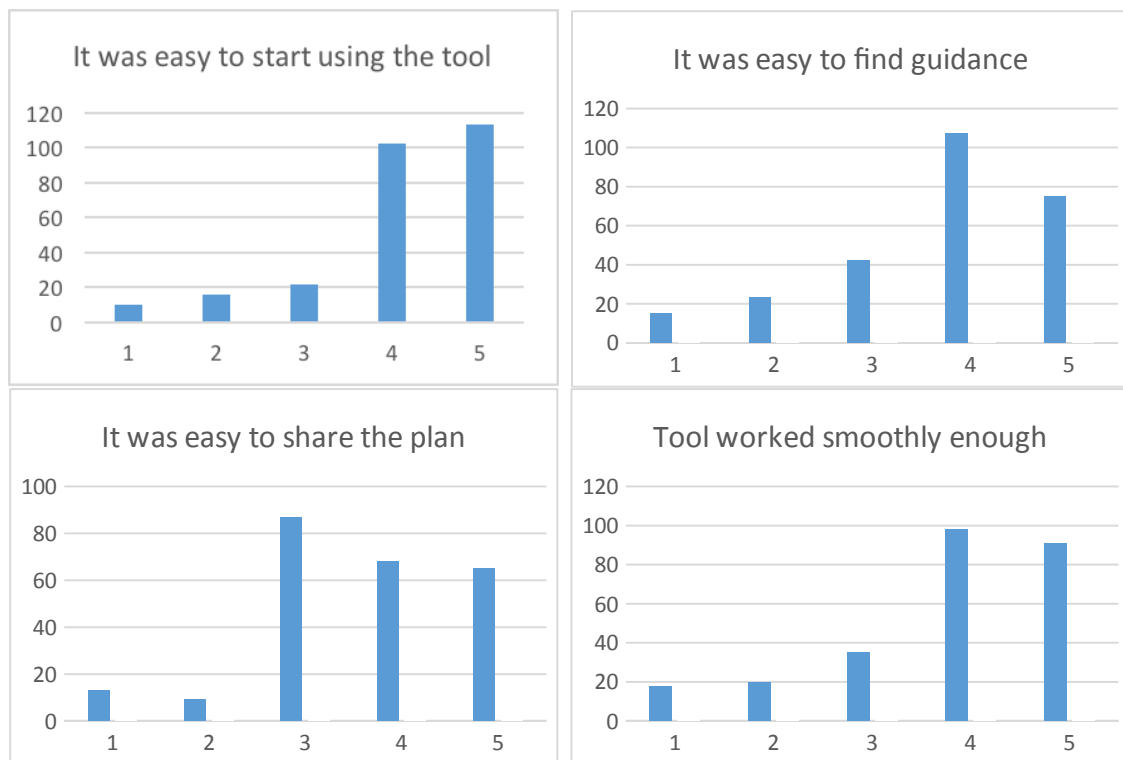
User Survey

A DMPTuuli user survey was conducted in October 2016, soon after the Academy of Finland's funding call was closed. It focused on themes such as using DMPTuuli, usability and technical features and RDM guidance. The questionnaire was carried out with the online analysis and survey tool Webropol, which allows you to send electronic questionnaires and analyse the data.

The questionnaire was sent to all registered users of DMPTuuli and responses were collected anonymously. The response rate was 10%, but due to the high number of users we still received 265 responses. Raw data from the survey is available through Figshare (Tuuli Project, 2016).

Most of the respondents (89%) had used DMPTuuli in order to apply funding. This is not surprising since the use of the tool was recommended by the Academy. 80% of the respondents had written a DMP alone and 18% together with colleagues.

Grades of the performance of DMPTuuli and the usefulness of the DMPTuuli guidance were gathered using multiple choice statements with a scale from 1 to 5 (strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, strongly agree). The majority of the users considered DMPTuuli as a tool easy to use (mean = 4.1, Figure 2). Most of the users though that finding guidance and sharing of the plan was easy.

The guidance offered in DMPTuuli was also considered useful (Figure 3), although it should be noted that the guidance offered in DMPTuuli varied depending on the researcher's organisation, since some universities had additional guidance to general national guidance.

Figure 2. Grades of performance of DMPTuuli.
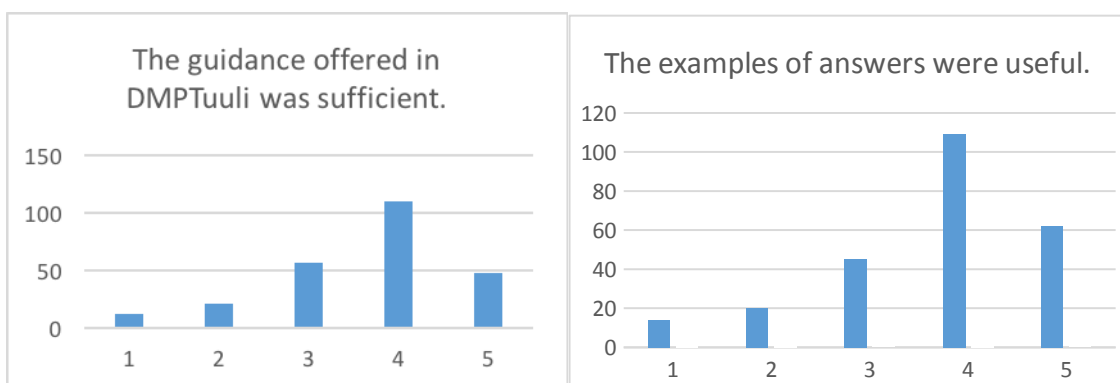
Figure 3. Grades of the usefulness of the DMPTuuli guidance.

A more detailed report of the user survey is available in Zenodo (Salmi and Ahokas, 2016).

Lessons Learned and Future Work

An international developer community is starting to grow around existing DMP tools and many research organisations all around Europe are getting started with research data management and DMP services (Tenopir et al., 2016). In this context, the project Tuuli has produced good results in supporting research organisations and institutions in Finland, in improving their RDM guidance and DMP training as well as in engaging the research funders in the ongoing discussion on DMP issues.

The number of registered users in the pilot was unprecedentedly high for a DMP tool, due to the recommendation by a major research funder. The number of concurrent users in the end of September 2016 was higher than ever before in the history of DMPOnline (Sallans and Donnelly, 2012). The pilot helped to detect a weakness in the DMPOnline code and triggered a further development project in DCC. Now the code is optimized for continuously growing load and use.

The interviews and survey show that researchers need even more subject, discipline and data specific instructions and examples. This is something the Tuuli project wishes to develop not just nationally but also internationally together with the international user group of DMPOnline.

In the Finnish context, guidance for various disciplines will be written together with researchers and research units after the pilot year. The DMP instructions for research projects using specific data type (e.g. sensitive data) will be produced in expert working groups. Thus, different collaboration models creating researcher guidance will be tested in the future.

The project has strong focus on guidance, training, promoting best practices, reviewing service and support for data management planning. The main goal was to improve research data management of research projects by stressing more careful planning. The focus was on emphasizing DMPs as easy-to-follow road maps guiding how data are managed throughout the research life cycle (Michener, 2015).

In the pilot, most of the DMPs were written for a grant application in the early phase of a project and the contents of the DMPs were naturally very brief. Cooperation with the funder was central for the pilot. It enabled us to promote the concept of DMP for those who were not familiar with it before. However, there is a big step from DMPs written for funders to DMPs detailed enough to be really useful to research projects. Hopefully, promoting the concept of DMP will inspire researchers to plan data management.

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