Data Management Plan Guidance for Research Students

Data management plans, data sharing statements, technical plans and other similarly-names documents are now required by most research funders. Brunel University also expects its researchers and post graduate students to create one as well.

The data management plan for research students has been designed to help you consider all the aspects of data management relevant to your doctoral research project and this document has been created to provide you with some additional guidance on how to complete it.

1. Overview

This section is for administrative purposes. Here, you should add brief details about the context of the project, including the project title, duration and the subject of your research.

2. Defining your data/research sources

This section helps you think about the data/sources you will be using and/or creating during the course of your research. The answers you enter in this section will help you identify what resources, such as storage, you will need to manage your data.

2.1 Where do your data/research sources come from?

Are your data/research sources gathered from experiments or from literature? Will they be from real time observation, existing data online or from archives?

2.2 How often will you get new data?

Will you be collecting data or sources continuously or from separate one-off events such as experiments or interviews? Thinking about the

frequency of when you will be creating or collecting your data will help you estimate how much data or information you will generate in total.

2.3 How much data/information will you generate?

If possible, try to estimate this in KB/MB/GB/TB.

If you will be keeping data or information in a non-digital format such as lab notebooks, questionnaires or note pads, consider how much physical storage (e.g. filing cabinets) you will need to store these.

2.4 What file formats will you use?

Research data/sources can come in a variety of different formats for example: text, numerical, multimedia, models, software, discipline specific or research specific. You should think about what software you will need to access or analyse the data/sources both now and in the longer term. Are they free/open? How would you access the data if you no longer had access to the appropriate software? Examples of open formats can be found here: en.wikipedia.org/wiki/Open_format .

3. Organising your data

The questions in this section will help you to identify how to keep your data safe and will make it easier for both you and possibly other researchers to make use of your data at the end of your project.

3.1 How will you structure and name your folders and files?

Structuring and naming your files in a way that is consistent and meaningful to you and others will allow you to find files easily. Some examples of how to do this could be: choose a standard vocabulary for file names, so that everyone uses a common language. Decide on conventions for if and when to use punctuation symbols, capitals, hyphens and spaces. Agree on a logical use of dates so that they display chronologically i.e. YYYY-MM-DD. Confirm which element should go first, so that files on the same theme are listed together and can therefore be found easily. Specify the amount of digits that will be used in numbering so that files are listed numerically e.g. 01, 002, etc.

3.2 What additional information is required to understand each data file?

A crucial part of making data user friendly, shareable and with long lasting usability is to ensure they can be understood and interpreted by any user, including yourself! For example, if you have used abbreviations or codes, would you remember what those codes mean in a few months or years' time? To ensure this is possible you should create documentation to accompany your data or research sources. Once you've decided what information should be recorded, you will need to think about how best to associate it with your data. Can you embed this information within the data or files themselves or can you create a "read me" file that you store alongside your data.

3.3 What different versions of each data file or source will your create?

Will your data/sources change over time, will you update or add additional data/information to existing files or create new files? Do your experiments overwrite existing files and how will you preserve files from a previous run? How will you differentiate between different versions, for example do you plan to use files names to denote different versions, e.g. V1, V1.1, V2 etc?

4. Looking after your data

4.1 Where will you store your data?

If you have more than one copy of your data/research material (for example on a laptop and desktop computer) you should decide which the primary copy is. Guidance on where you should store your data is available here: http://www.brunel.ac.uk/services/library/research/researchdatamanagement/store-and-access/data-storage

4.2 How will your data be backed up?

An ideal backup strategy should follow the 3-2-1 rule: at least 3 copies, on at least 2 different media, with at least 1 kept in a different physical location.

4.3 How will you test whether you can restore your data from your backups?

Sometimes backups don't work as you would expect. If you are using University networked storage you can be confident that your files will be frequently backed up. If you manage your own backups (for example on a laptop) you should periodically check that your files are up to date and will open correctly.

5. Sharing your data

This section will help you understand who you should share your data with. This is particularly important if your doctoral research is publically funded, as funding bodies are increasingly expecting final datasets/research outputs to be published, in addition to traditional publications.

5. 1 Who owns the data you generate?

The University acknowledges that Students, as non–employees, own the IP they create independently in the course of their degree studies, subject to a number of exceptions. These exceptions can be found here: https://www.brunel.ac.uk/__data/assets/word_doc/0018/7155/INTELLECTUALPROPERTYRIGHTSPOLICYfinal.doc

5. 2 Who else has the right to see or use your data, even before you share it?

During your project you might be using data that are covered by confidentiality agreements, the Data Protection Act 2018 or that you've not yet published. During this time you will probably want to restrict access to the data to yourself, your supervisor(s) and possibly members of your research group or external collaborators.

5. 3 Who else should reasonably have access to these data when you share it?

Your final data/research outputs should, where legally, ethically and commercially appropriate, be made available to the widest possible audience. There are a number of benefits to sharing your data/research outputs: These include greater visibility of your work and therefore higher citations and encourages more connection and collaboration between you

and other researchers, which can result in important new findings within the field.

5.4 What should/shouldn't be shared and why?

There may be good reasons why even publically funded research data should be kept private for example, participant confidentiality or commercial sensitivity. Data can be kept private if they are covered by the Data Protection Act 2018, licence agreements or contractual confidentiality clauses. There might also be ethical reasons why your data should not be released, where it might put people or the environment (such as the location of endangered species) at risk. However, it maybe that even with some of these restrictions, some of your data can still be made available; it doesn't necessarily have to be all or nothing. For example, if data can't be released immediately, could it be released at later date after a defined embargo period? If your data contain information that must be kept confidential, could access be granted to other researchers of they agree to certain conditions and if so, what conditions are these?

6. Archiving your data

The questions in this section will help you to plan how your data will be preserved at the end of your research project.

6.1 What should be archived beyond the end of your project?

Not all the data you have collected will be suitable for long term preservation. Requirements will vary by funder, publisher and data repository. In principle, you are expected to publish data that underpins publications, data that validates research findings and data that is worth keeping. In other words, the minimum expectation is that you should provide the information that someone would need to be able to validate published work.

6. 2 For how long should it be stored?

If you funded by a Research Council or similar funding body, it is very likely that they will stipulate how long your data must be kept after your project ends. For example, the EPSRC requires that any data underpinning publications must be kept for 10 years from the date of last access. Brunel

University also expects you to preserve your data for a minimum of 10 years. You can check your funder's requirements at http://www.brunel.ac.uk/services/library/research/researchdatamanagement/plan/funder-policies-on-data-management

6. 3 When will files be moved into a data archive/repository?

In general, any data which underpins a publication should be made available alongside the publication. You should check with your funder (if you have one) or publisher to ensure you comply with any embargo periods for research outputs. Embargo information by publisher and funder is available from http://www.sherpa.ac.uk/fact

6. 4 Where will the data be stored?

Some disciplines have their own subject specific archives in which you can deposit your data. Your supervisor should be able to tell you if these exist or you can search through http://www.re3data.org . If a subject specific archive does not exist then the University recommends using www.figshare.com to publish your data.

6. 5 Who is responsible for moving the data to an archive and maintaining it?

If you plan to deposit your data in a specialist data archive, you should discuss with your supervisor whose responsibility it will be to do this. Once data are archived it will be the responsibility of the data repository to maintain the data in line with the University, Funder's or publisher's requirements.

6.6 Who should have access and under what conditions?

Can the data be made publically available to everyone or should there be access control? Assigning your data a license can indicate to the user how they may reuse your data.

7. Executing your plan

7.1 Who is responsible for making sure this plan is followed?

You may wish to discuss and agree this plan with your supervisor. Your supervisor and/or the Principle Investigator of the project is responsible for ensuring that everyone working on the project, including any doctoral students are compliant with the University and funder research data management policy and requirements.

7.2 How often will this plan be reviewed and updated?

A data management plan should not been viewed as static document; it should be reviewed and updated to reflect any changes to your research.

7.3 What actions have you identified from the rest of this plan?

List them here with timescales for completion.

7.4 What further information do you need to carry out these actions?

The list below provides sources of additional information on research data management. Your Supervisor or other members of your research group may also be able to provide you with advice or contact the Library's Research Support Service researchdata@brunel.ac.uk

- Brunel University London guidance on research data management: https://www.brunel.ac.uk/life/library/SCO/Research-Data-Management
- Brunel University London Research Integrity code www.brunel.ac.uk/about/administration/policies-and-other-important-documents

Notes on completing this form

- Type as much (or as little) as you feel you need to into each box: it will expand to accommodate what you write;
- You can leave or remove the prompts in grey once you're done;
- For help with completing this DMP, please contact researchdata@brunel.ac.uk