

Data Management Planning

EPSRC FUNDING APPLICANTS



EPSRC

Engineering and Physical Sciences
Research Council

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Date	2 September 2015 (original 15 July 2013)
Version	1-3
URL	http://www.le.ac.uk/researchdata
File	UoL_DMP_EPSRCGuide_v1-3.pdf
Reviewed by	Research Computing Management Group (including College representatives, IT Services, Library, Research Support Office and Academic Practice Unit)
IPR	
Classification	May be viewed by anyone, anywhere in the world
Acknowledgement	<i>This document is an adaptation of a document produced by the data.bris team at the University of Bristol, whose permission to adapt the document is gratefully acknowledged.</i>

Document History

Version	Date	Author	Detail/Reason for Change
1-3	02.09.2015	A. Burnham	Inclusion of RDM Principles, updates and corrections
1-2	27.03.2014	A. Burnham	Minor edit.
1-1	20.02.2014	A. Burnham	Minor edit.
First published version (1-0)			
\UoL_DMP_EPSRCGuide_v1-0.docx (.pdf)	15.07.2013	A. Burnham	First published version.
Draft 4 \UoL_DMP_EPSRCGuide_v0-4.docx	08.07.2013	A. Burnham	Third draft from review by RCMG.
Draft 3 \UoL_DMP_EPSRCGuide_v0-3.docx	06.06.2013	A. Burnham	Third draft from review by RCMG. Approved for release by PVC Research.
Draft 2 \UoL_DMP_EPSRCGuide_v0-2.docx	28.05.2013	A. Burnham	Second draft for review by RCMG.
Draft 1 \UoL_DMP_EPSRCGuide_v0-1.docx	10.04.2013	A. Burnham/University of Bristol	First draft using University of Bristol document as basis.



It is a widely held view that publicly funded research data is a public good, produced in the public interest and should, wherever possible, be made openly available to validate research results, to increase impact, and to facilitate secondary scientific research and the creation of further knowledge.

A requirement for greater research transparency lies at the heart of several influential and recently published reports: most notably, the Research Councils UK (RCUK) Common Principles on Data Policy¹ and the UK government's Innovation and Research Strategy for Growth². Alongside these publications, most major funding councils, including the Engineering and Physical Sciences Research Council (EPSRC), have now developed their own policies relating to research data management.

This document outlines the EPSRC's expectations concerning the management of and provision of access to research data and what applicants for funding and EPSRC-funded researchers will need to do in order to comply with those expectations.

1. Introduction

The EPSRC (Engineering and Physical Sciences Research Council) endorsed their Policy Framework on Research Data³ in March 2011, setting out nine expectations concerning the management and provision of access to EPSRC-funded research data (see 4. [What you need to do – EPSRC expectations](#)).

The University developed a road map outlining how compliance with EPSRC's Policy Framework would be achieved by the deadline of 1 May, 2015. It is developing services, policies and processes to assist researchers in meeting the underlying requirements of each expectation. While much of the emphasis is on the responsibilities of the University, there are also implications for researchers that need to be taken into consideration, from the initial grant application through to the end of the project and ten years or more beyond.

The University expects EPSRC-funded researchers to be aware of the Policy Framework and to ensure that they undertake their research in a manner that complies with the EPSRC's expectations. Unlike other funding bodies, EPSRC does not *require* a data management plan when a grant application is submitted, however, you will still need to consider how your research data will be managed when writing a grant application. You are also likely to find a data management plan a useful tool personally within your research. If there are potential costs in storing and/or managing your research data, these will need to be highlighted in the costs of your grant.

The University is committed to supporting its researchers in meeting these expectations by providing an environment that recognises and supports research excellence.

¹ RCUK Common Principles on Data Policy, <http://www.rcuk.ac.uk/research/datapolicy/>

² UK Government, Department for Business Innovation & Skills. Innovation and Research Strategy for Growth, <https://www.gov.uk/government/publications/innovation-and-research-strategy-for-growth--2>

³ EPSRC Policy Framework on Research Data, www.epsrc.ac.uk/about/standards/researchdata

2. Where to get help and information

Refer to the University research data website www.le.ac.uk/researchdata where specific funder related information and the latest data management advice will be included.

The range of appropriate contacts includes:

- IT Services
- Library
- Research Support Office
- Leicester Learning Institute
- Information Assurance Services
- Enterprise and Business Development

A single point of contact is also available: email researchdata@le.ac.uk at any time and as early as possible in the bid process. This will mean specific queries or general request for assistance can be directed to the right place(s). You can also request assistance with development of a data management plan via this email address.

It is also recommended that you use the Digital Curation Centre (DCC) DMPOnline⁴ resource to create a data management plan (DMP) using the EPSRC template and requirements. As and when University of Leicester templates and specific guidance are created this will be confirmed on the RDM website⁵.

Specific research IT services available include Research File Storage, high performance computing, Wiki, 'LAMP' stack (a general purpose, Linux, relational database and web hosting service, based around open source software- Linux, Apache, MySQL and PHP), file transfer (FileDrop) and source code control (Subversion SVN)⁶.

In 2014 the University agreed it's **RDM Principles**⁷ which act to guide researchers and inform funders of the University approach (see 5. below).

EPSRC and general information

RCUK Common Principles on Data Policy	www.rcuk.ac.uk/research/datapolicy/
RCUK, Research Outcomes System	www.rcuk.ac.uk/research/researchoutcomes/
RCUK Policy on Open Access and Guidance	www.rcuk.ac.uk/RCUK-prod/assets/documents/documents/RCUKOpenAccessPolicy.pdf
EPSRC Policy Framework on Research Data	www.epsrc.ac.uk/about/standards/researchdata
EPSRC – Clarifications of EPSRC expectations on RDM (October 2014)	https://www.epsrc.ac.uk/files/aboutus/standards/clarificationsofexpectationsresearchdatamanagement/

⁴ DMPOnline, <https://dmponline.dcc.ac.uk/>

⁵ Data Management Planning, <http://www2.le.ac.uk/services/research-data/create-data/DMPlan>

⁶ IT Services, <http://www2.le.ac.uk/offices/ithelp/>

⁷ RDM Principles, http://www2.le.ac.uk/services/research-data/documents/uol_rdmprinciples

University of Leicester Research Data Roadmap	www2.le.ac.uk/services/research-data/rdm/rdmguidance-leicester/RD-roadmap
University of Leicester Research Data Management Principles	http://www2.le.ac.uk/services/research-data/documents/uol_rdmprinciples
University Research Data Management website	www.le.ac.uk/researchdata
University Research Data Management Support	researchdata@le.ac.uk
Digital Curation Centre EPSRC Funder's Data resource	http://www.dcc.ac.uk/resources/policy-and-legal/research-funding-policies/epsrc
Digital Curation Centre 'DMP Online' tool	https://dmponline.dcc.ac.uk/
Digital Curation Centre DMP Checklist	http://www.dcc.ac.uk/resources/data-management-plans/checklist
RCUK Joint Electronic Submission System (Je-S)	https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx
UK Government, Department for Business Innovation & Skills. Innovation and Research Strategy for Growth,	www.bis.gov.uk/innovatingforgrowth

3. Definitions

Research data are data, or units of information, that are created in the course of funded or unfunded research, and often arranged or formatted in such a way as to make them suitable for communication, interpretation, and processing, perhaps by a computer. Examples of research data include a spreadsheet of statistics, magnetic field data, a collection of digital images, or remote sensing data. Research data does not include data generated in the course of personal activities, desktop or mailbox backups, or data produced by non-research activities such as University administration and teaching.

Note that in the context of the EPSRC Policy Framework, research data is not defined as every piece of data produced during a project. EPSRC have indicated that they expect the data which underpins published research outputs to be kept as a priority. It is researchers themselves, however, who in the first instance should decide what should be kept and what should not.

4. What you need to do – EPSRC expectations

4.1 Be aware of the RCUK principles and EPSRC expectations

It is expected that researchers and research students will gain or already possess a general awareness of the Research Councils UK (RCUK) data principles, the EPSRC expectations, the regulatory environment, and the available exemptions which may be used (should the need arise) to justify withholding research data.

What you need to do, or be aware of:

- The EPSRC Policy framework highlights two principles in particular: that publicly funded research data should be made as widely and freely available as possible in a timely and

responsible manner; and that the research process should not be damaged by the inappropriate release of data.

- All research undertaken at the University complies with relevant legislation, including copyright, ethical and environmental information regulations, data protection, and Freedom of Information requirements. In certain circumstances there may be legal, ethical and commercial reasons why your research data cannot be made publicly available. If you are unsure about making your data publicly available, customised guidance and advice are available:
 - Where legal issues arise: for example, concerning the use of personal data and the Data Protection Act, or Freedom of Information issues refer to the University Information Assurance Service⁸.
 - If the data is produced as part of a commercial contract, or where copyright issues arise, for example, concerning the protection and commercial development in your work, refer to refer to the University Enterprise and Business Development⁹.
 - Where ethical issues arise, consult within your College and refer to the research data management website and University policy¹⁰.
- Finally, a research data management website has been developed that contains useful links to internal and external sources of guidance and information about research data management issues¹¹. Training for researchers is being updated to reflect recent developments in research data policy, and details of relevant researcher training opportunities are made available here.

4.2 Provide details in your research papers of how the supporting research data can be accessed

This particular expectation corresponds closely to the RCUK Policy on Open Access and Guidance¹², which states that all papers resulting from research that is funded by the Funding Councils must include a statement on how and on what terms any underlying data can be accessed by third parties. If there are considered to be good or compelling reasons to protect access to the data, these should be included in the statement. This requirement applied to all RCUK-funded research outputs from April 2013.

What you need to do, or be aware of:

- Some published research papers already contain information specifying where supporting data may be accessed. This normally occurs when supporting data is provided to the publisher as supplementary material, or where data has been deposited in an external

⁸ Information Assurance Service, <http://www2.le.ac.uk/offices/ias>

⁹ University Enterprise and Business Development, <http://www2.le.ac.uk/offices/ebd>

¹⁰ Research Data Management website, University ethics policy, <http://www2.le.ac.uk/services/research-data/create-data/dp-ethics>

¹¹ University Research Data Management website, www.le.ac.uk/researchdata

¹² RCUK Policy on Open Access and Guidance, <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/documents/RCUKOpenAccessPolicy.pdf>

repository.

- Please be aware that journal publishers may have specific requirements that govern how research data is referenced within a paper. This may be via a reference in the form of a unique URL or Digital Object Identifier (DOI) (for an explanation, see expectation 5) that will lead a third party to a web page where the data can be directly accessed. Alternatively, third parties may be guided to a website that provides the contact details of a custodian of the data. Given the extended timescales involved in this process (see expectation 7), it is recommended that the authors of published academic papers do not provide their own current contact details as a means by which underlying research data may be accessed, as these details are likely to change over time.
- If you plan to use an established data repository service in which to deposit your data, ask for a unique reference or identifier that can be included within the paper. If you're not planning to (or able to) deposit your data with an established repository service, please seek guidance.
- With regard to research outputs, please be aware that EPSRC funded researchers are also required to enter details of these into the RCUK Research Outcomes System (ROS)¹³.

4.3 Be aware of University of Leicester policies and processes concerning research data holdings

The EPSRC expect all their funded researchers or research students to comply with the University's policies and processes concerning research data holdings and with requests by third parties to access research data or (in exceptional circumstances) to provide justification of why this is not possible.

What you need to do, or be aware of:

- The University requires that all research publications are deposited with the Leicester Research Archive (LRA)¹⁴. The University also requires that all doctoral students submit a copy of their final thesis to the LRA.
- The University provides a Research File Storage facility. You will need to be aware of its terms of use and registration process¹⁵.

4.4 Consider how your non-digital data can be made publicly available

The EPSRC do not expect all digital data to be directly accessible online nor is there an expectation that all non-digital research data should be digitised. It is suggested, however, that non-digital data should be stored in a way that facilitates future sharing, so that it will not be laborious to access it.

¹³ Research Councils UK (RCUK), Research Outcomes System, www.rcuk.ac.uk/research/researchoutcomes/

¹⁴ Leicester Research Archive, <http://www2.le.ac.uk/library/for/researchers/publish/open-access>

¹⁵ Research File Storage, <http://www2.le.ac.uk/offices/ithelp/services/rfs>

What you need to do, or be aware of:

- In some cases it may be practical to digitise some of your data. When it is not practical to digitise data, it can be made accessible only to a researcher who visits Leicester or through providing photocopies of key parts of the data.

4.5 Publish metadata describing your research data within 12 months of the data being generated and if it is digital data include a DOI

Metadata¹⁶ is 'data about data' or 'cataloguing information' that enables data to be found, understood and re-used where necessary. The metadata that you record can range from a detailed description of the data to explanatory material about why the data was created and how it has been used. Important metadata elements may include subject matter, creators and owners, and technical or contextual information that enables the data to be understood.

There are various other pieces of information that it is useful to record; bear in mind that the metadata must be sufficient to allow others to understand what research data exists, why, when and how it was generated, and how to access it. It may help to imagine what information another data user would need to understand and use the data once your project has concluded. If no metadata were provided, the other user would be faced with the difficult task of 'unpicking' your data. How, for instance, would they make sense of your file and folder names? Or your methodology or approach to data processing? What extra information would they need to make the most of your data?

What you need to do, or be aware of:

- As part of the process of depositing data, a repository service will enable the publication of the metadata describing your data in an appropriately structured way and in accordance with recognised standards. The DataCite¹⁷ organisation defines a minimal set of mandatory metadata, for the purpose of citation and retrieval. As well as complying with this EPSRC expectation, there are many benefits to depositing and publishing your research data, including the active promotion of your research.
- A DOI or Digital Object Identifier provides the means by which a digital object, for instance a dataset, can be persistently identified. As part of the process of depositing your research data and making it publicly accessible, a repository service should automatically assign a DOI to your data, which can be used for citation purposes and for associating the dataset with related data and other research outputs.

4.6 If access to your data is restricted, include the reasons in your published metadata

While the re-use and sharing of data is very much encouraged, it is recognised that there may be legal, ethical and commercial constraints on the release of particular research data which make it unsuitable for sharing. It may be that restricted parts of your data cannot be shared, but the remainder can.

What you need to do, or be aware of:

- As previously mentioned (see expectation 1), the University provides policies and guidance covering intellectual property, data protection, and ethical issues relating to research data.

¹⁶ Metadata, <http://www2.le.ac.uk/services/research-data/organise-data/metadata>

¹⁷ DataCite, <https://www.datacite.org/node>

In accordance with these policies and guidance, if access to data is restricted, conditions for granting access can be determined on a case-by-case basis. If you are unsure about making your data publicly available, seek advice as described at expectation 1.

- Once it has been determined that access to your data must be restricted, the EPSRC will expect you to provide justification.

4.7 Your research data must be securely preserved for at least 10 years after any privileged access period expires

It is expected that you will preserve research data from any EPSRC-funded projects in a secure manner for at least 10 years after the expiry of any privileged access period agreed by the EPSRC.

What you need to do, or be aware of:

- The University Research Data Roadmap outlines its commitment to develop practice, process and appropriate facilities to support research and researchers¹⁸.
- Researchers from all disciplines are strongly advised to use the University's Research Data Storage Facility (RFS), which provides an integrated, secure, resilient facility, with the capacity to expand as demand increases. Full details of how to register for data storage are available on the University's website¹⁹.
- The University of Leicester is currently (2015) in the process of developing a research data repository
- If you choose not to store your EPSRC-funded data in the RFS or in some other UK-based data centre (if for example you are collaborating with a researcher at another University), you will need to ensure that it is not held somewhere where the legal safeguards are lower than in the UK. If you are using a cloud storage solution, you will need to be aware of the legal jurisdiction covering your cloud provider.

4.8 Your research data must be curated through its lifecycle

The curation of data is an on-going process that will reduce the threat to their long-term research value and help to mitigate the risk of digital obsolescence. Curation will enhance the long-term value of data by making it available for further research. In the case of EPSRC-funded research, the data lifecycle includes its management throughout the research project and during the 10 or more years thereafter while it is preserved.

What you need to do, or be aware of:

- Digital curation involves maintaining, preserving and adding value to digital research data through its lifecycle²⁰. The Digital Curation Centre (DCC) have developed a Curation Lifecycle Model that presents a graphically overview of the stages that comprise the digital curation

¹⁸ University of Leicester Research Data Roadmap, <http://www2.le.ac.uk/services/research-data/rdm/rdmguidance-leicester/RD-roadmap>

¹⁹ University of Leicester Research File Storage registration, <http://www2.le.ac.uk/offices/ithelp/services/rfs/request-access>

²⁰ What is digital curation? Digital Curation Centre (DCC), www.dcc.ac.uk/digital-curation/what-digital-curation

lifecycle²¹.

- The University recognises that numerous stakeholders will be involved during the data curation lifecycle. The Lifecycle Model mentioned above is presented as an ideal, whereas in reality, researchers may enter at any stage depending on their current area of need. When considering digital curation it may help you to think about your own data over the longer term, how it is created, the file formats that you are using, and how well suited these are to long-term preservation. It is also important to note that digital curation is a developing area where good practice continues to emerge. The University research data management website has been developed that contains links to internal and several external sources of guidance and information about the research data management.

4.9 Consider how curation of your data will be funded

The University will aim to ensure that adequate resources are provided to support the curation of EPSRC-funded research data; these resources will be allocated from within its existing public funding streams, whether received from Research Councils as direct or indirect support for specific projects, or from Higher Education Funding Councils as block grants.

What you need to do, or be aware of:

Curation of your EPSRC-funded research data will need to be funded either by the University or via specific research grants.

5. University RDM Principles

In 2014 the University agreed its **RDM Principles**²² which act to guide researchers and inform funders of the University approach and should be referred to in funding proposals.

Research data are defined as any material created or collected for the purposes of analysis to generate and validate original research results, irrespective of the format of data. Research data may be digital, paper based or in other forms. Examples of different types of research data include datasets, images, text (such as transcripts of interviews), audio and video recordings, and computer scripts.

Scope

1. *These principles apply to all research conducted at the University, regardless of funding source. They do not imply additional compliance where good practice and relevant research funders' requirements are already being followed.*

²¹ DCC curation lifecycle model, www.dcc.ac.uk/resources/curation-lifecycle-model

²² RDM Principles, http://www2.le.ac.uk/services/research-data/documents/uol_rdmprinciples

Research inception and planning

2. *Data management planning is an integral, essential and dynamic component of the research process from inception and should include provision for the selective long term custodianship of research data.*
3. *Research proposals should include all possible recovery of direct costs of research data management where the funder allows this.*

During the research: management and storage of data

4. *During the research process, data are an asset which needs to be appropriately managed and stored: to meet legislative, funder, information governance and University requirements; to facilitate data security (confidentiality, integrity, availability); to facilitate appropriate access, collaboration and sharing of data and results.*
5. *Data can be actively managed throughout, following and updating the data plan, recognising that storage and its funding is not infinite, with ongoing decisions regarding retention and destruction.*

After the research: retention, sharing, publishing, citation, re-use

6. *When the research has been completed, research data (including websites) of long term value, or data required by funders or the University must be selected for retention, then preserved and curated for as long as appropriate.*
7. *Data retained in these circumstances must be offered to funder or discipline repositories and/or to the UK Web Archive as appropriate. If such repositories are unavailable or unsuitable, data must be stored in a University repository. Data deposited with external repositories or unsuitable for making open access must be registered with the University.*
8. *There is a presumption of open access to data held in a University or other public repository. However, access may be restricted, subject to a time embargo or not permitted for legal (i.e. intellectual property, data protection, confidentiality, contractual requirements), ethical or commercial reasons.*
9. *Data should not be deposited with any organisation that does not commit to appropriate access and availability for re-use and exclusive rights to re-use or publish research should not be handed to commercial publishers, unless this is a condition of funding.*
10. *The re-use or sharing of data that are made available should not be unnecessarily restricted by licences or terms of use.*
11. *All research outputs must cite data produced and/or used during research as appropriate, detailing access to that data.*

Responsibilities

12. *Primary accountability for research data management lies with the most senior University researcher associated with the work or project. Responsibility for research data management may be delegated.*
13. *During the research process, researchers are responsible for adherence to legal requirements such as Data Protection and for the creation of metadata and other documentation that enables data to be discoverable, understandable and re-useable.*
14. *After the deposit of data with a repository, the repository is responsible for the on-going management of that data in accordance with legal, technical and other requirements.*
15. *The University will be responsible for providing a Research Data Management service led by the Library to include training, advice, guidance and data curation.*
16. *The University will secure sustainable solutions that meet the requirements for long term data storage and re-use as set out in these principles.*

The Managing Research Data guide series comprises:

- An Introduction to Managing Research Data – For Researchers and Students
- Data Management Planning – AHRC funding applicants
- Data Management Planning – BBSRC funding applicants
- Data Management Planning – EPSRC funding applicants
- Data Management Planning – ESRC funding applicants
- Data Management Planning – MRC funding applicants
- Data Management Planning – NERC funding applicants
- Data Management Planning – STFC funding applicants
- Data Management Planning – Non-RCUK funding applicants

They are part of a range of RDM material produced by the University, all available via www.le.ac.uk/researchdata.

 **University of Leicester**

What would you do if you lost your research data tomorrow?

Take the research data health check... and find help to secure, share and exploit your valuable research.

Chances are you could use some helpful pointers in all of these!

Create	Organise	Keep	Find & Share
 <p style="font-size: 0.7em;">Have you...</p> <ul style="list-style-type: none"> <input type="checkbox"/> fully understood your research funders' data management requirements? <small>Consent and retention require that publicly funded research is made available for reuse – are you up to date with their latest policies? Your future funding might depend on it!</small> <input type="checkbox"/> written a data management plan? <small>Your funder may already require this but habits in from the original stage to avoid headaches in the future.</small> <input type="checkbox"/> gained ethics approval/consent? <small>Writing a data management plan will aid planning and help you to negotiate ethics and governance requirements.</small> <input type="checkbox"/> protected your intellectual property? <small>Seeking intellectual property considerations for a range of data may be appropriate in certain cases, ensuring career prospects and perhaps your financial future too!</small> 	 <p style="font-size: 0.7em;">Are your research files and data...</p> <ul style="list-style-type: none"> <input type="checkbox"/> clearly documented in terms of content (using standard nomenclature)? <small>Are you clear on how to store data? Will you be able to remember how you generated your data, and what you or someone else is able to find in the future when you wish to reuse and share?</small> <input type="checkbox"/> clearly labelled with versions and dates? <small>How will you remember which was the definitive version and which dataset was used in producing a given research outcome?</small> <input type="checkbox"/> logically structured and named? <small>Can you be identified how you generated data. Can you tell that the dataset is?</small> <input type="checkbox"/> future proofed against broken links, being persistent identifiers? <small>The persistent identification of digital resources can play a vital role in enabling their accessibility and usability over time using recommended data standards.</small> 	 <p style="font-size: 0.7em;">Do you know...</p> <ul style="list-style-type: none"> <input type="checkbox"/> how to restrict access to your research data to the right people? <small>Have you considered what assembly of data users access to that only the right people have access to your research?</small> <input type="checkbox"/> which data to keep and which data to discard? <small>Managing research data effectively means being selective, which data to discard and when as well as what to keep and to share long!</small> <input type="checkbox"/> how securely your data is stored? <small>What happens if your storage media fail? How robust is it? Can't get it or it has and could somebody else reuse it?</small> <input type="checkbox"/> how your data is backed-up? <small>Have you made use of university and/or external resources to back up data so that you have multiple copies in case of loss or theft?</small> 	 <p style="font-size: 0.7em;">Do you know how to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> find existing information resources related to your research? <small>What can you find research data that you can re-use or combine with your own to produce new research?</small> <input type="checkbox"/> share data with your collaborators securely and effectively? <small>Whether building a collaborative proposal, generating results for others to comment on or sharing the final outputs of your research, how will you link with your colleagues (and of wider sharing)?</small> <input type="checkbox"/> deposit your research data and outputs to an open repository? <small>Is there an appropriate disciplinary or institutional repository and what do you need to do to deposit your research output? Plan ahead to avoid reformatting.</small> <input type="checkbox"/> publish your research, and get it cited in well? <small>Metadata and data centres must make research data available to others while providing credit to the researcher who did the work. Your future career could depend on it!</small>

To find information, support, advice and training, as well as links to external resources, go to www.le.ac.uk/researchdata or email: researchdata@le.ac.uk