



Data Management Plan for scientific research

How does it work?

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Introduction

Research data are valuable. They play an increasing role in science and must be managed with care to enable reuse and verification of research results. DANS promotes sustained access to digital research data and closes [contracts](#)¹ containing agreements regarding the archiving of research data.

Researchers are increasingly required to draw up a Data Management Plan. In order to meet the researchers' wishes to be able to access practical information with regard to managing, documenting and sharing data, DANS has drawn up this Data Management Plan. Divided in three sections, it contains instructions for drawing up a Data Management Plan and it addresses questions that are important for researchers in the early stages of a data collection project. In the appendix you can find a Data Management Plan Checklist.

Sources for this plan include the Data Management Plan of the [UK Data Archive](#)² in the United Kingdom and the [Inter-university Consortium for Political and Social Research](#)³ in the United States.

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¹ See <http://www.dans.knaw.nl/en/content/data-archive/data-contracts>

² See <http://www.data-archive.ac.uk>

³ See <http://www.icpsr.umich.edu>

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Data Management Plan - Checklist

Part 1 Preparation of the data collection project

1.1 General information about the data collection

Both for the funding of the data collection project and for the eventual execution of the project, it is important that a general description is made of the data to be collected, its nature and scope as well as the method of data collection.

1.2 Overview of previously collected data

Are previously collected data available that are comparable to the new data to be collected? If so, then it is important to make an overview of the data in question as well as a description of the reason why it is important to collect new data. Such an overview can be made with the help of the catalogues of the major data archives and repositories.

Why this is important

The new data collection can then be geared to previously collected data. In addition, such an inventory may have a cost-saving effect. It is possible that certain data were collected before and that the intended analyses can also be performed on data already available.

Additional information

Such an overview can be made with the help of the catalogues of the major data archives and repositories. In the Netherlands, these include [Data Archiving and Networked Services \(DANS\)](#)⁴, the [3TU.Datacentrum](#)⁵ and the repositories of universities.

1.3 Choice of software and hardware to be used

What hardware and software will be used and are discipline-specific standard data formats taken into account when choosing the software?

Why this is important

If hardware and software are becoming obsolete, reuse of the data will not be possible in the long run. As a result, digital preservation of data is at risk. It is therefore recommended to use software, which will eventually be converted to a file format that can always be used by a data archive or repository.

Additional information

DANS performed research into the preservation of file formats and compiled a list of preferred and accepted formats. The list is composed of the preferred formats and accepted formats of the following types of files:

- Text processing programmes
 - Spreadsheets

⁴ See <http://www.dans.knaw.nl/en>

⁵ See <http://datacentrum.3tu.nl/en/home/>

- Statistical files
- Images
- Databases
- Plain text
- Mark-up
- Cartographic data (CAD) (DWG, DXF)
- Geographic Information System (GIS) (TAB, SHP)
- Audio and video files (excerpts)
- Text processing programmes

[Overview of file formats, preferred formats and accepted formats](#)⁶

1.4 Determination of intellectual property and legal requirements

Which person or institution is copyright owner with regard to the collected data, and will these rights be transferred in due course? What are the applicable legal requirements or regulations for sharing and archiving data? Is any copyright protected material used, e.g. photos, certain measuring instruments or scales? If this is the case, how does the project receive permission to use and distribute the material?

Why this is important

In order to be able to make the data available, through a data archive or repository, after a data collection project has been concluded, it is necessary to know who owns the intellectual property rights. If, during the collection of data, any material is used which is protected by copyright, this copyright must be respected.

Additional information

Both for depositing and using data, agreements apply which are based on Dutch and European legislation and the Code of Conduct for use of personal data in scientific research of the Association of Universities in the Netherlands (VSNU). This code of conduct is an elaboration of the Dutch Data Protection Act.

For the benefit of depositing social sciences data, DANS identified several legal aspects with regard to depositing data and making data available. The regulations are also described in more detail in the Licence Agreement and Conditions of Use. The Licence Agreement contains the agreements between the data depositor and DANS, while the Conditions of Use describe the agreements between DANS and the data users. Although the information applies to the social sciences in particular, it also includes elements that apply to other scientific disciplines.

[Legal Information provided by Data Archiving and Networked Services](#)⁷

⁶ See [http://www.dans.knaw.nl/sites/default/files/file/archief/Preferred formats ENG.pdf](http://www.dans.knaw.nl/sites/default/files/file/archief/Preferred%20formats%20ENG.pdf)

⁷ See <http://www.dans.knaw.nl/en/content/data-archive/legal-information>

1.5 User information

Have any measures been taken to gain insight into the use of the data, e.g. who will be using the data and for what purpose?

Why this is important

The users for whom the data are collected can be decisive for the manner in which the data are managed and shared.

1.6 Interoperability

Is it important that the data will be accessible via digital, so-called enhanced publications? Is it a requirement that the data can be merged with data managed by an external organisation?

Why this is important

In order to be able to make specific agreements with scientific publishers and the intended data managing institutions, respectively.

Part 2 Implementation of the data collection project

2.1 Data Management

Who is the primarily responsible person for data management? Who is responsible for the documentation of all phases of the data collection project? Is there a standard naming convention? What procedures are in place (if applicable) to ensure that personal data are handled confidentially? How and where are copies of the data stored and how is safe storage guaranteed? How many copies are stored and how are they kept up to date and/or synchronised? What arrangements have been made with regard to version management? How and in which phase of the data collection has internal access to the data been arranged?

Why this is important

By answering the above questions, data management during the research phase will be properly arranged. Also, digital copies are vulnerable and the best method is therefore to store several copies at several locations. The safe storage of personal data is, if applicable, an important part of this.

Additional information

A number of prominent foreign data archives, such as the Inter-university Consortium for Political and Social Research – ICPSR in the United States and the UK Data Archive in United Kingdom, recently made elaborate data management plans. For additional detailed information on various aspects of management and use of data during the stage of data collecting and the initial analyses on data, see the following links:

UK Data Archive - [Managing and sharing data – Best practices for researchers](#)⁸

ICPSR - [Elements of a Data Management Plan](#)⁹

Australian National Data Service - [Data Management for Researchers](#)¹⁰

2.2 Choice of metadata to be used

What metadata will be used and do they belong to any particular metadata standard?

Why this is important

Adding metadata to data means that the contents of a data collection are effectively unlocked. Adding metadata also implies that data can be found or retrieved more easily.

⁸ See <http://www.data-archive.ac.uk/media/2894/managingsharing.pdf>

⁹ See <http://www.icpsr.umich.edu/icpsrweb/content/ICPSR/dmp/elements.html>

¹⁰ See <http://www.ands.org.au/researchers/manage-data.html>

Additional information

[Dublin Core Metadata Standard](http://dublincore.org/)¹¹

[Data Documentation Initiative](http://www.ddialliance.org/)¹²

[Metadata for geo data](http://www.geonovum.nl/geostandaarden/metadata)¹³

[NESSTAR](http://www.nesstar.com/)¹⁴

¹¹ See <http://dublincore.org/>

¹² See <http://www.ddialliance.org/>

¹³ See <http://www.geonovum.nl/geostandaarden/metadata>

¹⁴ See <http://www.nesstar.com/>

Part 3 Archiving data and making data available

3.1 Depositing data in a data archive or repository

How and where will the data be kept for the long term? Indicate how the data will be selected for archiving and how long the data need to be kept. Have the costs of archiving in a data archive or repository been included in the budget of the data collection project?

Why this is important

It is important to be able to make data available for new research and access to research data promotes the publicity and verifiability of scientific research. Data archives and repositories make certain demands on the data and the documentation of data for reuse purposes. This is especially important in light of reuse in the long term. Therefore, it is recommended that part of the research budget is reserved for this purpose.

Additional information

It is recommended to store data in a data archive or repository that meets the guidelines of the internationally established Data Seal of Approval. The [Electronic Archiving System \(EASY\)](#)¹⁵ of DANS has acquired the Data Seal of Approval.

[Instructions for online depositing in EASY](#)¹⁶ can be found on the website of DANS.

Additional information about the obligation to deposit data from, for instance, projects subsidised by the Netherlands Organisation for Scientific Research (NWO) or the national government is found on the following page:

<http://www.dans.knaw.nl/en/content/data-archive/data-contracts>¹⁷

This page also contains information about guidelines for depositing archaeological data.

Additional information about the [Data Seal of Approval \(DSA\)](#)¹⁸ is found on the DSA website.

¹⁵ See <https://easy.dans.knaw.nl/ui/home>

¹⁶ See <http://www.dans.knaw.nl/en/content/data-archive/depositing-data>

¹⁷ See <http://www.dans.knaw.nl/en/content/data-archive/data-contracts>

¹⁸ See <http://www.datasealofapproval.org/>

Part 4 Recommended literature

Would you like to have more detailed information on the preservation and selection of research data? The publication '[Selection of Research Data, Guidelines for appraising and selecting research data](#)'¹⁹ contains the latest state of affairs regarding this subject. This publication is based on literature studies, several interviews with major players and the experiences of DANS and the 3TU.Datacentrum.

The publication '[Preparing Data for Sharing; Guide to Social Science Data Archiving](#)'²⁰ gives detailed information about all stages, from collecting data to archiving social sciences data. It was written in collaboration with the Inter-University Consortium for Political and Social Research - ICPSR in the United States.

Recently the fifth updated edition from the [Guide to Social Science Data Preparation and Archiving](#)²¹ of the Inter-university Consortium for Political and Social Research (ICPSR) in the USA has been released.

¹⁹ See <http://www.dans.knaw.nl/en/content/categorieen/publicaties/dans-studies-digital-archiving-6>

²⁰ See <http://www.dans.knaw.nl/content/categorieen/publicaties/dans-data-guide-8>

²¹ See <http://www.icpsr.umich.edu/icpsrweb/content/ICPSR/access/deposit/guide/>

Part 5 Appendix Data Management Plan – Checklist

This checklist puts together the questions mentioned throughout the plan. It serves as a guideline when drawing up a Data Management Plan in the early phase of a data collection project.

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- Both for the funding of the data collection project and for the eventual execution of the project, it is important that a general description is made of the data to be collected, its nature and scope as well as the method of data collection.
- Are previously collected data available that are comparable to the new data to be collected?

- What hardware and software will be used and are discipline-specific standard data formats taken into account when choosing the software?

- Which person or institution is copyright owner with regard to the collected data, and will these rights be transferred in due course?

- What are the applicable legal requirements or regulations for sharing and archiving data?

- Is any copyright protected material used, e.g. photos, certain measuring instruments or scales? If this is the case, how does the project receive permission to use and distribute the material? Have any measures been taken to gain insight into the use of the data, e.g. who will be using the data and for what purpose?

- Is it important that the data will be accessible via digital, so-called enhanced publications? Is it a requirement that the data can be merged with data managed by an external organisation?

- Who is the primarily responsible person for data management?

- Who is responsible for the documentation of all phases of the data collection project?

- Is there a standard naming convention?

- What procedures are in place (if applicable) to ensure that personal data are handled confidentially?

- How and where are copies of the data stored and how is safe storage guaranteed?
- How many copies are stored and how are they kept up to date and/or synchronised?
- What arrangements have been made with regard to version management?
- How and in which phase of the data collection has internal access to the data been arranged?
- What metadata will be used and do they belong to any particular metadata standard?
- How and where will the data be kept for the long term?
- How will the data be selected for archiving and how long shall the data need to be kept?
- Have the costs of archiving in a data archive or repository been included in the budget of the data collection project?

Data Archiving and Networked Services (DANS)

DANS promotes sustained access to digital research data. For this purpose, DANS encourages scientific researchers to archive and reuse data in a sustained manner, e.g. by means of the online archiving system EASY. DANS also provides access, through Narcis.nl, to thousands of scientific datasets, e-publications and other research information in the Netherlands. In addition, the institute provides training and advice and performs research into sustained access to digital information.

Driven by data, DANS ensures that access to digital research data keeps improving, by its services and by taking part in (international) projects and networks. Please visit www.dans.knaw.nl for more information and contact details.

DANS is an institute of the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Netherlands Organisation for Scientific Research (NWO)

