



Repository Operations Documentation

Version 4.0

Created date:	30 September 2009
Last updated:	31 March 2018
Review Due:	August 2018 (unless significant change)
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Previous version:	Version 3.0

Conventions

A Source Code block is used to highlight text that represents identifiers, directory names, file names and similar concepts.

Words or phrases in curly braces ('{' and '}') are placeholders that should be replaced with the appropriate content. For example, AIP-identifier indicates that a valid AIP identifier, of the form arch-{collection number}-{version number}, should be inserted, where, in turn, {collection number} and {version number} must also be replaced with actual values, while the dashes, which are not enclosed by braces, are literal text to include in the final AIP identifier.

Square brackets ('[' and ']') are used to indicate a set of choices, from which one choice should be selected. Each choice is separated from the next by a pipe character ('|'). For example {file name}.[pdf|tif] indicates a file name that should finish with either the extension '.pdf' or the extension '.tif'.

Introduction

This document summarises the requirements for preparing collections for the ADS repository, and for their management within the repository.

This document makes considerable use of terminology and concepts from the OAIS reference model.

An OAIS is defined within the Consultative Committee for Space Data Systems document as "an archive, consisting of an organization, which may be part of a larger organization, of people and systems that has accepted the responsibility to preserve information and make it available for a Designated Community."¹

¹ Consultative Committee for Space Data Systems (2012) *Reference Model for an Open Archival Information System (OAIS). Magenta Book. Issue 2. June 2012.* pp1-2
<https://public.ccsds.org/Pubs/650x0m2.pdf>, see also Consultative Committee for Space Data Systems

There are six mandatory responsibilities that an OAIS compliant archive should meet and they are summarised below:

- Negotiate for appropriate deposits
- Obtain sufficient control of resources
- Determine scope of community
- Ensure independent utility of data
- Follow procedures for preservation
- Disseminate to the designated community

The ADS carries out all of these core functions.

In the OAIS model, information packages move from producers through the OAIS and on to the data consumers. In the ADS, depositors send us data together with contextual metadata (the Submission Information Package or SIP), either via an automated system known as ADS EASY², the OASIS system³, File Transfer Protocol (FTP) or via the physical delivery of data on disc/other storage device.

Each deposit is then accessioned into a collection and archived (as an Archival Information Package or AIP). Work on the preservation of the data collection is carried out. Finally an online interface is created for the collection and in this way it can be disseminated and accessed by our users (as a Dissemination Information Package or DIP).

Submission Information Package (SIP)

SIP is the OAIS term for a deposit of data. The ADS will accept SIPs that fit the requirements given in our:

- Collections Policy⁴
- Guidelines for depositors⁵
- ADS EASY⁶

Guidance on the content of depositions is provided by the selection of material for deposit documentation⁷ and through negotiation with the Collections Development Manager and Digital Archivists.

Archival Information Package (AIP)

AIP is the OAIS term for a coherent set of information that will be preserved. SIPs accepted by the ADS will be added to an AIP that conforms to the requirements outlined in this document.

An AIP consists of files containing the data, documentation, metadata and administrative material (scanned or digital licence, correspondence etc.) for a collection.

(2002). *Reference Model for an Open Archival Information System (OAIS)*'. CCSDS 650.0-B-1 Blue Book,

² <http://archaeologydataservice.ac.uk/easy/>

³ <http://oasis.ac.uk/pages/wiki/Main>

⁴ <http://archaeologydataservice.ac.uk/advice/collectionsPolicy.xhtml>

⁵ <http://archaeologydataservice.ac.uk/advice/guidelinesForDepositors.xhtml>

⁶ <http://archaeologydataservice.ac.uk/easy/>

⁷ <http://archaeologydataservice.ac.uk/advice/selectionGuidance.xhtml>

The deposited data itself represents what the OAIS model defines as the content information, which is the actual material being preserved. Also a part of the AIP is the Preservation Description Information (PDI), which is the administrative metadata used to plan and manage the preservation of the content information. At the ADS, collection level metadata and administration information are stored in the Collection Management System (CMS), while an extension to this: the Object Management System (OMS), holds both technical and contextual metadata pertinent to the individual files.

The OAIS model allows AIPs to contain other AIPs. An ADS AIP may contain other AIPs where previous editions have been replaced with a new version. It can also hold those preservation files migrated into newer formats.

AIP Directory Naming

Each AIP must have a persistent identifier, taking the form:

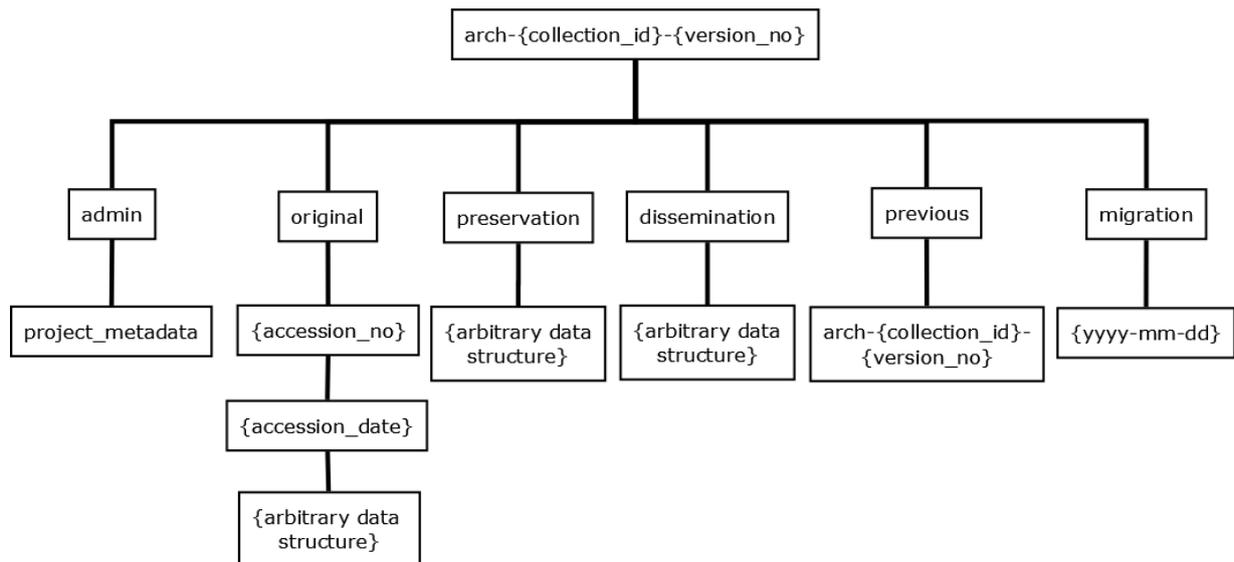
arch-{collections number}-{version number}
(i.e. arch-335-1)

The collections number will be a unique identifier for the collection. This number will be automatically generated by the ADS Collections Management System (CMS).

The first version of a collection should be given the edition number 1, and subsequent editions should be numbered sequentially (2,3,4 etc.). Versions must be numbered using positive integers. An ADS AIP may hold more than one version of a collection. All previous versions of a collection should be stored in the /previous/ directory under their AIP identifier. Preservation files which have been migrated to new formats should be stored in the /migration/ directory.

AIP Directory Structure

Conceptually, the OAIS model describes an AIP as having two main parts, the content information and the preservation description information (PDI). For the ADS, these two parts of an AIP are both stored as files in a single directory tree, where it is stored in appropriate /admin/ and/or /documentation/ directories. The AIP directory tree is a logical rather than physical structure, and its contents may be spread across multiple storage devices (for example the preservation data may be in a separate location to the dissemination). With this in mind a consistent directory structure is required, although implementation of the OMS, which provides an accurate record of file locations and relationships, allows us to store information about files and other aspects of the AIP outside of this file structure. See Appendix 2 for further information on this.



The 7 main subdirectories

The AIP directory structure has seven main subdirectories (summarised below). These neatly organise the material in an AIP according to its purpose and origin.

- **original** – Material accessioned (subject to ADS Ingest Procedures)⁸, from the depositor as the SIP is stored here.
- **admin** – Administrative material, notably metadata about the contents of the AIP, the licence agreement (scanned or electronic) and correspondence specific to the archive are held here.
- **preservation** – The data directory for holding preservation files and file-level metadata.
- **dissemination** – The data directory for holding dissemination files and file-level metadata.
- **previous** – This directory can be used to hold previous editions of the AIP.
- **migration** – This directory can be used to hold old preservation normalisations of files which have been migrated into newer formats.

These 6 directories must be named as listed above (in lower case).

This level of the AIP directory must not contain any other files or directories.

For further information about the content and structure of these directories see the relevant section below.

original

The /original/ directory should contain the following:

All files received from the depositor and accepted as part of the final deposit.

The /original/ directory should be structured as follows:

- A subdirectory named by the appropriate accession number must be created under /original/ to hold data from each individual accession (for example /770/)

⁸ <http://archaeologydataservice.ac.uk/advice/Ingest.xhtml>

- A subdirectory named by date must be used under the accession number directory to distinguish tranches of material received from the depositor at different times under one accession. This directory should be named as follows: yyyy-mm-dd (for example /2008-04-23/).
- The subdirectories of the SIP should be maintained in the structure they were delivered in. Other logical subdirectories may be created by ADS staff where appropriate.
- Changes to the names of directories or files provided by the depositor are discouraged. However, on occasion certain characters may have to be removed or replaced. Guidelines on editing names are outlined in the 'File Naming Policy' available on the ADS internal wiki, and replicated in brief below.

SIP File name changes:

Character	Name	Replace with / Strip	Notes
	Space	_	
.	Period / full stop	Strip	
,	Comma	-	
	Pipe	Strip	
/ \	Slash and Backslash	Strip	
?	Question mark	Strip	
*	Asterisk	Strip	
"	Quotation mark	Strip	
:	Colon	Strip	
;	Semicolon	Strip	
> <	Greater and less than	Strip	
+	Plus	_plus_	
[]	Square brackets	Strip	
%	Percent sign	Strip	
^	Caret	Strip	
()	Round brackets	Replace with '_' or '-'	
!	Exclamation mark	Strip	

@	At	_at_	
#	Hash / pound	Strip	
\$	Dollar	Strip	
`	Grave accent	Strip	
{ }	Curly brackets	Strip	
~	Tilde	Strip	May indicate a temporary or backup file
'	Apostrophe	Strip	
=	Equals	Strip	
&	Ampersand	_and_	

The original directory should therefore have a structure much like this:

arch-{collections number}-{version number} / original / {accession number}
 / {accession date} / {depositor's file structure}

(i.e. arch-335-1 / original / 770 / 2008-04-23 / {depositor's file structure})

admin

The /admin/ folder must contain the following files (see Appendix 4 regarding reserved file names):

File name	Description	Comments
licence.tif licence.pdf	A licence form scanned and saved as an uncompressed tif or PDF/A file, or when issued digitally stored in PDF/A form.	Where appropriate, scanned licences must meet the 'Requirements for Scanned Hardcopy Material' (Appendix 3). Typically, however, licences are sent digitally via the CMS and returned by email. These must be stored in a PDF/A format. On occasion non-standard licences may be issued (such as where the depositor has requested data be deposited under formal CC-BY) in this case file-naming should indicate the nature of licence, e.g. licence_cc-by.pdf. Any extensions or explanation of licensing (such as an individual signing on behalf of many, or a defunct organisation) may be stored in an ancillary text file (suitable for preservation) with a suitable name, e.g. licence_addendum.txt, but should also be documented in the CMS in the 'Negotiations' section.

The /admin/ folder may additionally contain the following items which should be stored in a directory called /project_metadata/:

File name	Description	Comments
dc_metadata.txt [deprecated]	A text file containing the Dublin Core metadata record that has been loaded into ArchSearch	This is not actively undertaken for current collections, but may exist for older archives
original_{accession_id}.txt [deprecated]	A text file containing checksums for all files within the original deposition	This is not actively undertaken for current collections, but may exist for older archives
email_{yyyy-mm-dd}.txt	Copy of any e-mails sent to, or received from the data producer	Store only those mails which: - help document the SIP - give us permission to remove or edit files in the SIP - have been sent with original data to be accessioned into our archive- clear up copyright issues surrounding any of the data. These, and any additional or supplemental emails, (scanned or electronic) should also be stored in the CMS in the 'Negotiations' section.
Project metadata files	Other files (normally supplied as part of the SIP) that help document or describe the project as a whole. Where possible original filenames, as named within the SIP, should be preserved. If created by ADS, in a logical and meaningful way. Do not store any files that are duplicates of data and documentation that is already held in the /preservation/ directory.	If the documentation relates to a group of files or a particular file then this should, instead, be stored in the /documentation/ directory in the which the file, or files, are stored. If a /documentation/ directory does not exist then one should be created.
Introduction and Overview text	Introduction and Overview text for the web interface should be stored here.	Where this information has been gleaned from other documents within the AIP, there is no need to store it separately.
deposit_receipt_{accession_id}.xlsx [deprecated, but reinstated]	A digital copy of the deposit receipt sent to depositor after accessioning of data, should stored in an appropriate preservation format (xlsx), alongside the accompanying email (see above).	This was deprecated for a number of years, but was reinstated during 2017/2018 to make it clear to depositors what SIP contained. This may also be stored as an e-mail (see above), or since August 2017 as an export from the OMS (stored in xlsx form) and the accompanying email.

Note: it is important that files in the /admin/ directory are in suitable preservation file formats.

Data directories

The AIP Directory folder contains the following directories for holding the data component of the archive:

- /preservation/ - All files allocated for preservation
- /dissemination/ - All files allocated for dissemination

These 2 directories may contain the following subdirectories:

/ {file type} / [deprecated]	Organisation of data into discrete 'file type' directories named accordingly (/tif/, /jpg/, /pdf/ or /csv/) has been deprecated.
/ {file type} / {arbitrary} / [deprecated] / {arbitrary} / [current]	Currently there is no controlled file structure within either preservation or dissemination directories other than to preserve the inherited directory structure from the original deposit, as this provides important contextual information about the dataset. Other logical structures may be created by the ADS in order to clarify complexities or to facilitate the display of files within the online interface. Any significant changes to directory structure should be recorded as a 'Process - Restructure' in the CMS. Previously arbitrary sub-directory structures were only permitted under the file type directory.
/ {documentation} /	This directory should be used for any files which relate to all, or a specific group of files within the dataset. For example ADS_raster_metadata_template.xlsx should be stored in a /documentation/ directory alongside the images to which the metadata refers. In circumstances where metadata refers to a group of files stored in a series of directories the file should be stored in a /documentation/ directory at the highest level within the mandated data structure, e.g. /preservation/documentation/.
/ {file type} / {arbitrary} / documentation / [deprecated] / {arbitrary} / documentation / [current]	The 'documentation' directory may also be replicated within the arbitrary file structure to allow the storage of metadata or documentation specific to the data within that directory (see above).

These directories should not contain:

- Thumbnail, preview or other images that we have created specifically for display within the web interface. These should be held in an /images/ directory within the relevant web directory itself. They should be seen as part of the web interface rather than a part of the archive.

- Oracle loading files (applicable for special collection databases and monument inventory databases). These are, generally, no longer produced, but where they have been created should be preserved in the admin/project_metadata folder rather than within the data directories.

previous

The /previous/ directory should contain:

- Files that were part of the AIP, but have now been replaced by a new edition. Files should be stored in /previous/ under a subdirectory named by the old AIP identifier (arch- {collections id} - {version number}). Underneath this directory, the directory structure should preserve the structure that the files have been moved from – this will help us see where these files have originated from.

arch-{collections number}-{current version number} / previous /
arch-{collections number}-{previous version number} / {extant file structure}

(i.e. arch-335-2 / previous / arch-335-1/ {extant file structure})

See Examples of ADS directory structure: Example 3 for further clarification on usage.

migration

The /migration/ directory should contain:

- Files created by the ADS that were once part of the AIP but are now considered obsolete, having been replaced by newly migrated files in more up-to-date file formats. Files should be stored in /migration/ under a subdirectory named by the date that the files were replaced or moved. Underneath this date directory, a logical directory structure should be used based on the directories that the files have been moved from – this will help us see where these files have originated from.

arch-{collections number}-{current version number} / migration /
{date file migrated} / {extant file structure}

(i.e. arch-335-1 / migration / 2017-12-01 / {extant file structure})

See Examples of ADS directory structure: Example 4 for further clarification on usage.

Bibliography

Consultative Committee for Space Data Systems (2002). *Reference Model for an Open Archival Information System (OAIS)*. CCSDS 650.0-B-1 Blue Book.

Consultative Committee for Space Data Systems (2012) *Reference Model for an Open Archival Information System (OAIS). Magenta Book. Issue 2. June 2012.*
<https://public.ccsds.org/Pubs/650x0m2.pdf>

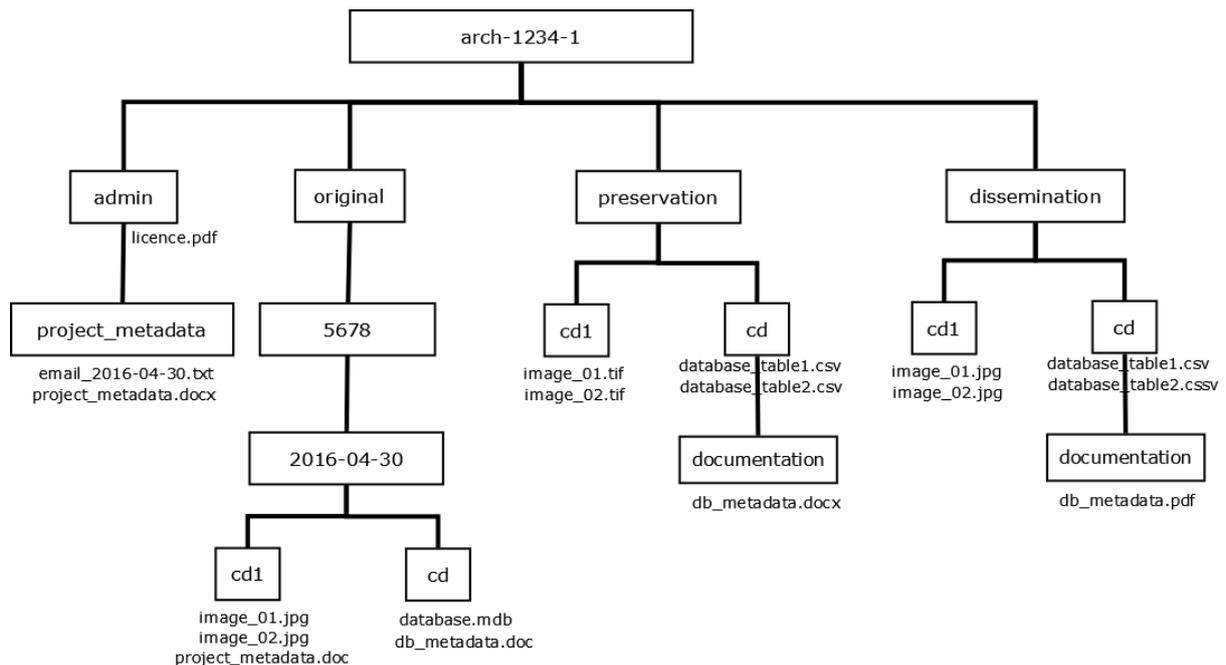
Examples of ADS directory structure

The following examples are intended to illustrate a number of different archiving scenarios showing how we should manage and organise the data within our directory structure:

Example 1: a 'simple' one-off deposit

In this example, a database with documentation, associated images and project metadata were deposited on 2 cds and accessioned on the 30th April 2016.

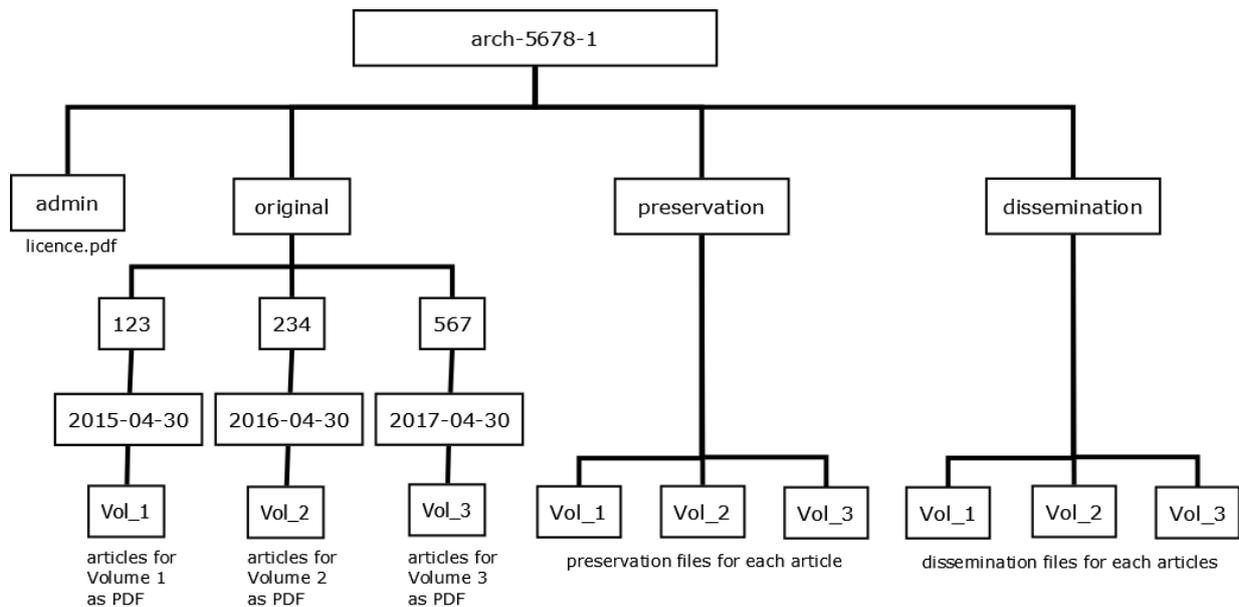
- In an email sent on 30th April 2016 the depositor clarified some queries about the database and gave permission to ignore one of the data tables that contained only test data so this email has been stored in /admin/project_metadata/. Documentation for the collection as a whole is stored in the /admin/project_metadata/ directory as well and may include a completed ADS project metadata template
- Database tables have been saved as csv files under /preservation/{sub-folder}/ and /dissemination/{sub-folder}/. As csv is both a preservation and dissemination format the files are stored in the /preservation/ folder and duplicated in /dissemination/.
- Likewise, the data dictionary and entity relationship diagram for the database are stored in the /documentation/ directory under /preservation/{sub-folder}/. These documents, where relevant, should be in suitable formats for the preservation.
- TIF images have been stored for preservation purposes under /preservation/{sub-folder}/ and batch converted to jpg images for dissemination (stored under /dissemination/{sub-folder}/)



Example 2: a run of journals (we receive new data on a yearly basis)

In this example, pdf files have been deposited for 3 volumes of a journal over the course of 3 years.

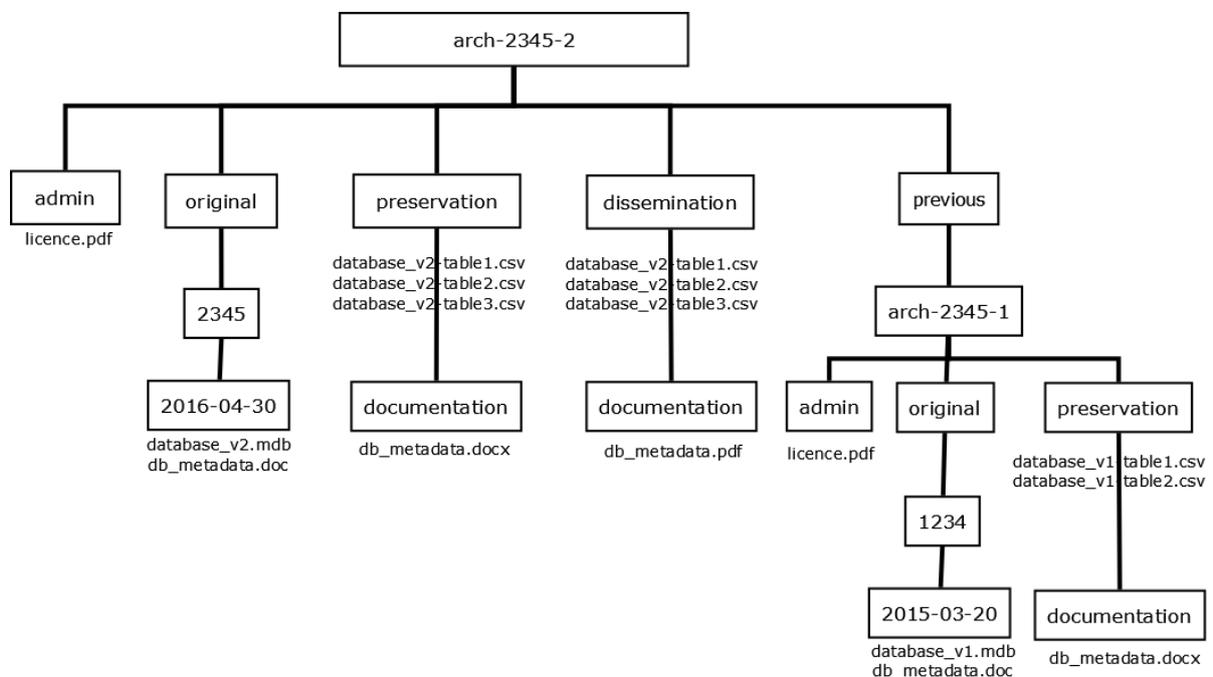
- 3 directories in /original/ store the 3 deposits of data (i.e. 123, 234, 567)
- Files are converted to preservation format and stored in /preservation/ under a volume number directory. Splitting files into separate volumes helps maintain order and structure
- PDF files are stored in /dissemination/vol_{no}/ for dissemination online
- The usual files are stored in /admin/.



Example 3: an update to a database (showing use of /previous/ directory)

In this example, a database (and documentation) has been deposited in 2015 and has been made available as a series of csv downloads. Subsequently in 2016, the final database containing updates and amendments was accessioned – this constituted a new edition of the archive

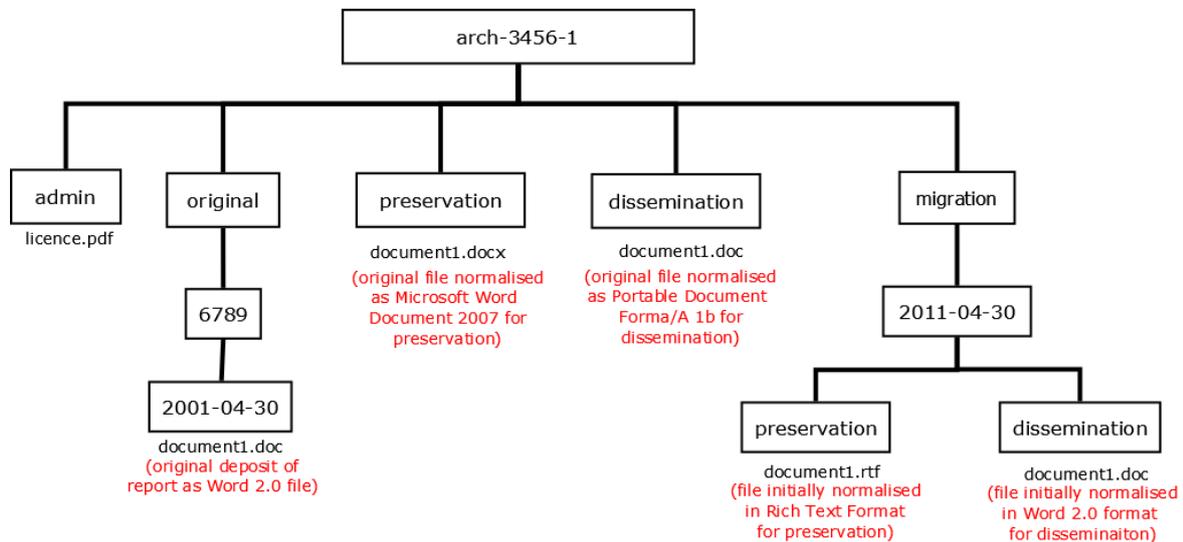
- 1st deposit: database is saved as csv files for preservation and dissemination and database documentation is stored in a /documentation/ directory
- 2nd deposit: the new and complete version of the database is converted to csv and stored under /preservation/ and /dissemination/ with the original documentation (still applicable as the data structure has not changed).
- The whole AIP is renamed to reflect the fact that it is now the second version.
- The old original, admin and preservation csv files (and the directory structure that they sit within) from the 2015 version are moved into the /previous/ directory, stored under the original AIP name (version 1)



Example 4: what happens when we carry out a file migration

In this example a selection of archaeological reports were accessioned in 2001. They were submitted as Microsoft Word 2.0 files and we disseminated them in their original format and preserved them as Rich Text Format.

In 2011 we decided that we needed to migrate both the preservation and the dissemination files into newer formats. Here is how the resulting directory structure would look.

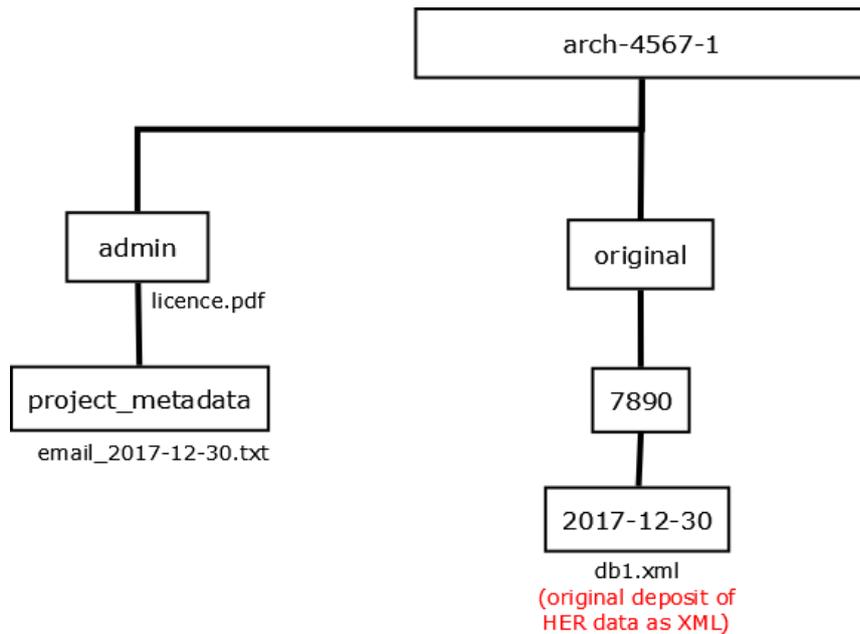


- Old doc and rtf versions of the files are moved into /migration/ (stored under the date that the files were moved, and with the directory structure that shows the purpose and original data structure)
- New docx and pdf versions of the files are created for preservation and dissemination purpose and preserve the original data structure
- Metadata in the CMS/OMS is updated to reflect the changes

Example 5: a single deposit of an HER database

In this example we have received a database from a Historic Environment Record (HER). They have signed a licence which is different to our standard deposit licence and have agreed that the data is for dissemination through ArchSearch alone. The ADS therefore have no commitment to preserve this data.

- Beyond preparing the data and loading into ArchSearch no action is needed
- Data files used to load the database tables into Oracle need not be stored here
- /preservation/ and /dissemination/ data directories are not necessary



Appendix 1

Example file type directories under data directories

As of August 2017 the ADS no longer adheres to a prescribed directory structure, other than to store data underneath the appropriate /preservation/ and /dissemination/ directories. Beneath this the ADS preserves the meaningful structure given the data by the depositor. Where data lacks logical structure or the structure proves problematic then the digital archivist will create an appropriate structure.

Historically, however, the ADS stored data underneath the /preservation/ and /dissemination/ directories in subdirectories relating to the file extensions, and in some circumstances the data type. A tif file, for example, would be stored in a directory called /tif/. Within the directory structure this would look like:

```
arch-{collections number}-{current version number} / preservation /  
tif / {extant file structure} / {tif files}
```

(i.e. arch-335-1 / preservation / tif / {extant file structure} / {tif files})

The notable exception to this structure was where data was organised according to data type. In the case of ESRI Shapefile (.shp) and there associated files, for example, data would be preserved in a /gis/ subdirectory.

```
arch-{collections number}-{current version number} / preservation /  
gis / {extant file structure} / {file name}.shp, {file name}.shx, {file name}.dbf
```

(i.e. arch-335-1 / preservation / gis / {extant file structure} /
mygis.shp, mygis.shx, mygis.dbf)

Similarly in the case of a geo-rectified tif files these would be stored in a /geotif/ directory in order to differentiate them from 'standard' tif files.

```
arch-{collections number}-{current version number} / dissemination /  
geotif / {extant file structure} / {file name}.tif, {file name}.tfw
```

(i.e. arch-335-1 / dissemination / geotif / {extant file structure} / mygeotif.tif, mygeotif.tfw)

Historically this structure was adhered to afford easy management of datasets, but with the advent of the CMS and particularly the OMS, where more detailed information about file location and data type can be more effectively stored the need for this structure was negated.

The movement to the current file structure allows for increased consistency across the SIP, DIP and AIP, removing duplication of the structure within extension/data type subdirectories and allowing for greater simplicity in the data structure.

Appendix 2

Where to store files

The ADS currently has a split AIP, with preservation files being held in /ADS_preservation/ and dissemination files in /adsdata/.

In order to avoid a situation where we are duplicating things, follow these guidelines when constructing directories in these two separate areas:

/ADS_preservation/ should contain:

- The /admin/ folder and all of its contents
- The /original/ folder and all of its contents
- The /preservation/ folder and all of its contents
- The /previous/ folder (where it exists) and all of its contents
- The /migration/ folder (where it exists) and all of its contents
- The only situation where the /dissemination/ directory may appear here are where there are dissemination files which are not available for download on-line (because of delayed release or large file size for example)

/adsdata/ should contain:

- The /dissemination/ folder and all of its contents
- The /migration/ folder (where it exists) and all of its contents

If we need to combine the AIPs into a single directory structure it will be easy to do so if these guidelines have been followed.

As a general rule, **avoid creating empty directories**. If there is nothing in a directory then it does not need to exist.

Appendix 3

Requirements for Scanned Hard Copy Material

The licence form, hard copy documentation and other supporting information must be scanned at, or above these minimum standards:

- Black and white documents, 200dpi 1 bit.
- Greyscale documents, 200dpi 8 bit.
- Colour documents, 200dpi 24bit RGB.

Scanned images must be saved as TIF v6.0 (pref) or PDF/A. Image dimensions should be adjusted according to the size of the scanned paper (A4, legal etc.). Illegible images should be rescanned at a higher resolution and/or colour depth.

If scanned images are saved as TIF, a separate file must be created for each page scanned rather than a single multi-page TIF file.

Appendix 4

Reserved File Names

A number of file names (such as licence.tif/licence.pdf) are reserved for particular purposes. These file names must be used where appropriate.

Reserved file names can be modified. Modifications should be placed after the main name of the file, and separated from it by a dash.

A reserved file name should be modified to include sequential numbers if there is a need to save the information in multiple files. For example, under /admin/, a three page hardcopy deposit licence scanned and saved as a series of TIF images could be named as follows: licence-1.tif, licence-2.tif, licence-3.tif.

A reserved file name may be further modified to include a date, in ISO 8601 format, if there is a need to distinguish between two versions of a file created on different dates that are both still current in some way (for example licence-2004-03-01.pdf). If both a date and a sequential number modifier are used, then files **MUST** be named as follows (using the example from above): licence-2004-03-01-1.tif, licence-2004-03-01-2.tif, licence-2004-03-01-3.tif.

Appendix 5

Data Types

During accession, and subsequent work to create both the AIP and DIP, the DROID software tool is utilised to characterise and create appropriate technical metadata for both data and metadata.⁹ The technical metadata produced during this process is stored within the OMS. Alongside this technical metadata each object is assigned a data type appropriate to the type of data which the object contains. Current data types include:

- 3D Model
- Audio
- Database
- Geophysics
- GIS
- Harris Matrices
- Image
- Laser Scanning
- LIDAR
- Photogrammetry
- RTI
- Spreadsheet
- Statistics
- Text
- Vector
- Video
- Websites

With the addition of

- Admin
- Documentation

The 'Admin' data type is used to classify administrative documentation, such as the deposit licence or deposit receipt, relevant to the collection. While the 'Documentation' data type is used to identify both collection and file level metadata which is stored externally to the OMS.

Where possible data types are assigned programmatically, based largely on the file extension and the DROID signature, however, in circumstances where these are not unique to a specific data type, for example, CSV files which are an accepted format for Database, Spreadsheet, Statistics and Geophysics data, these may need to be manually updated from within the CMS or directly into the OMS. Similarly, a TIF file which is typically classified as a raster 'Image' data, can in some circumstances be a geo-rectified TIF image and therefore be classified as a 'GIS' file. The data type is used in conjunction with the appropriate file level metadata for that data type which may be stored in the OMS or, for older collections, within an external file.

⁹ <http://www.nationalarchives.gov.uk/information-management/manage-information/preserving-digital-records/droid/>

Appendix 6

PREMIS and the expression of relationships between objects.

The current OMS structure allows the expression of relationships between objects through the so called 'Parent/Child Table'. Digital archivists will identify an appropriate 'parent' and 'child' object, and will characterise the relationship between these objects using terms derived from the PREMIS relationship type, created by the Library of Congress (USA).¹⁰ The current list of relationship terms is as follows:

- Is Documented In
- Is Source Of
- Includes
- Has Part
- Has Sibling
- Is Represented By
- Supersedes

Full definitions of these relationships are available directly from the Library of Congress, but those listed above are summarised below:

PREMIS_REL_TYPE	PREMIS Definition
Reference: "A relationship in which one object provides documentation for another."	
Is Documented In	A relationship between an environment object and the information that documents it. (The ADS uses this generally for digital objects, not environment objects)
Derivation: "A relationship in which one object is the result of a replication or transformation performed on the related object. The intellectual content of the resulting object is the same, but the object's instantiation, and possibly its format, are different."	
Is Source Of	... the related object is a version of this object created by a transformation, this is a derivation relationship, not a structural one
Structural: "A relationship between parts of an object. This is essential preservation metadata, because if a preservation repository can't put the pieces of a digital object back together, it hasn't preserved the object."	
Includes	... for the relationship of a representation to a file.
Has Part	A relationship in which the object is contained in the related object when these are the same object category. For instance a Web page intellectual entity is part of a larger Web site intellectual entity.
Has Sibling	... the object shares a common parent with the related object (the ADS notes this when a parent object is not deposited).
Is Represented By	A relationship in which an abstract intellectual entity is represented as a file or representation.

¹⁰ http://id.loc.gov/vocabulary/preservation/relationshipType/collection_PREMIS.html

Supersedes	A relationship between an environment object and another where the described object replaces another. This allows for an audit trail of environments to be maintained.
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Some examples of how each of these relationships is understood are given below:

Example 'parent' object	Relationship Type	Example 'child' object
Image1.tif	Is Documented In	image_metadata.csv
	Is Source Of	
GIS_files.zip	Includes	gis.shp (replicated for other files within the zip)
Spreadsheet.xlsx	Has Part	sheet1.csv (replicated for other tables within the same spreadsheet)
database_table1.csv (originally part of a database which has been deposited as separate csv files)	Has Sibling	database_table2.csv (replicated for other files within the original database)
	Is Represented By	
Report_2018.pdf	Supersedes	Report_2017.docx