

Specification for Digital Objects

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DO--1: Scope / Purpose

The digital object module supports the description and metadata encoding of simple and complex digital objects that are accessible online. The module is not intended to support the description of digital media, such as zip drives, that are not accessible and are typically stored as part of an analogue archival collection.

The digital object module is based on a digital object architecture consisting of one or more digital content files, metadata describing the files and their content, and metadata relating the files and metadata into a coherent and usable whole. For this specification, a simple digital object contains only one digital content file (plus any number of derivatives of the same file), whereas a complex digital object contains two or more content files (plus any number of derivatives for the same files), thus requiring some metadata indicating the relationship among files. (See entries for digital object, simple digital object, and complex digital object in the California Digital Library “Glossary,” <http://www.cdlib.org/gateways/technology/glossary.html>.)

The digital object module will accommodate digitized surrogates of materials contained in archival collections. Digital object records can be generated from, and automatically linked to, the resource description for the material. The generated description can then be modified to note differences between the content described in the resource record and that described in the digital object record, should a difference exist. Alternatively, digital objects may be described prior to description of the resource, and then linked at a later time to the corresponding resource description.

In addition the digital object module will accommodate digital material, surrogates or born-digital, that are not part of a larger archival collection. This allows the digital object module to be purposed for other digital library tasks (e.g., such as describing visual image collections, audio collections, and electronic theses and dissertation collections).

DO--2: Record / template description

The digital object record requires completion of part of the primary description and supports, where wanted, the description of component parts of the digital object. Definitions are the same for elements used for both primary and component description.

Basic description elements

- Digital Object ID (**Required**)
- Publish (**Required**)
- Level
- Title (**Required** if date expression, or date begin and date end pair in date sub-record are not used)
- Language
- Object Type
- XLink Actuate Attribute
- Xlink Show Attribute
- Restrictions

[Each digital object must have a digital object id and at least a title or date (date expression or date begin / date end pair in date sub-record)]

Component description elements

- Label (**Required** if title or date expression, or date begin and date end are not used)
- Title (**Required** if label or date expression, or date begin and date end are not used)
- Component Identifier
- Publish (**Required**)
- Language

[Each digital object component must have at least a label, a title, or a date (date expression or date begin / date end pair)]

System control data

- Record Created Timestamp
- Last Modified Timestamp
- Record Created Staff Name
- Last Modified Staff Name

Linking functions:

- To extent sub-record(s) from digital object and digital object component record
- To date sub-record(s) from digital object and digital object component record (**Required** if title is not used)
- To file version sub-record(s) (containing a link to file technical metadata) from digital object and digital object component record
- To note record(s) from digital object and digital object component record
- To name record(s) from digital object and digital object component record
- To subject record(s) from digital object and digital object component record
- To repository from digital object record
- From resource or resource component record (read only) to digital object record

Command functions:

General:

- Save (Writes data to disk, retaining state when command is entered)
- Close (Closes record, returning to digital object browse list. If Save command was not entered prior to close, operator is asked if changes to record should be saved or not)

Components:

- Add child component (adds a component record one level down from the context, i.e., the component selected when command is entered)
- Add sibling component (Adds a component record at the same level as the context location, i.e., the component selected when command is entered)

- Delete component (Deletes a selected component, **and all components contained in the selected component**).

Navigation (using digital object browse list as context)

- First (to first record in browse list as set)
- Previous (from context record to previous record in browse list as set)
- Next (from context record to next following record in browse list as set)
- Last (to last record in browse list as set)

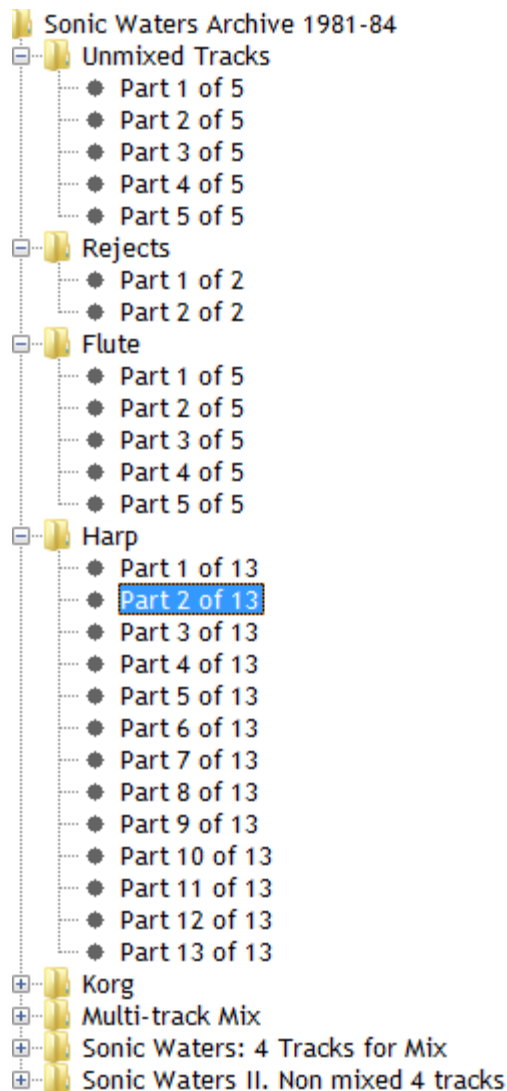
[Actual records displayed are relative to how the browse list is sorted at the time the navigation command is entered. The movement from one record to another should be reflected by changing the highlighted record in the browse to correspond to the record selected by the navigation command.]

Outputs:

- Export METS (Opens a dialogue window for configuring and generating a METS record)
- Export MARC (Opens a dialogue window for generating a MARCXML record)
- Export MODS (Opens a dialogue window for generating a MODS record)
- Export Dublin Core (Opens a dialogue window for generating a Dublin Core record)
- Export VRA (Opens a dialogue window for generating a VRA record)
- Reports (Opens a dialogue window for selecting and generating a digital object report)

Hierarchical display:

The selected digital object or digital object component record shall be complemented with a hierarchical display of the digital object structures. Such a display might resemble the following representation of a digital object:



There are several key properties / features required in this display:

- The component in the hierarchy corresponding to the component displayed in the record template will be highlighted.
- The display content for the parent node should be taken from the digital object title element, or, if that is not present, from the digital object date (date expression or concatenation of date begin / date end pair, e.g., 1967-1972)
- The display content for all component nodes should be taken from, in order of preference, from 1) the component title element, 2) date (date expression or concatenation of date begin / date end pair, e.g., 1967-1972), or 3) label
- For either parent or component node, the date expression should be preferred over the date begin / date end pair, when all are present)

- Nodes containing components should be represented differently than nodes not containing components.
- All nodes containing components should be capable of being expanded to show their components or contracted to conceal their components
- Indention should be used to represent parent/child subordinate relationships
- The hierarchy may be modified using a drag and drop process:
 - A component (and all components it contains) may be moved to another position among its sibling components, e.g., in the example above, the “Harp” component and its 13 components may be moved prior to the “Flute” component.
 - A component (and all components it contains) may be moved from one context to another context. For example, the component “Part 13 of 13” in the “Harp” component might be moved to the last position in the “Flute” component, being relabeled accordingly.
 - A component (and all components it contains) may be promoted to a higher level in the hierarchy.
 - A component (and all components it contains) may be demoted to a lower level in the hierarchy.

Content publication

For any digital object in its collection, the application’s default setting is to “publish” the digital object and all of its parts (all components, notes, sub-records, and linked records). However, a repository may choose to change the default setting to not publish at several points within a digital object by changing the value of the Publish element to “False”:

- Digital Object Parent Record: will suppress the entire digital object record and all of its parts. The digital object will not appear in the public browse list for digital objects, nor will it appear in public search results. It will also be impossible to export a metadata record for the digital object.
- Digital Object Component Record: will suppress the component and all components it contains, including all notes and sub-records belonging to the

component and to the components it contains. The component record will not appear in the public hierarchical display of the digital object; nor will it appear in public browse lists or search results. It will also be suppressed from digital object exports.

- Digital Object Note Record: will suppress each note for which the Publish element is marked “False.” The note will not appear in public versions of the digital object record, and it will not export as part of digital object records.
- File Version Sub-Record: will suppress each content file for which the Publish element is marked “False.” The URI will not appear in public versions of the digital object, and it will not be exported as part of the digital object metadata record. Also the content file itself will not be made available.

A repository can use the Publish function to fine tune how it makes its digital object information accessible. For instance it can choose to make the digital object metadata accessible but suppress the content files, or just suppress the master content files while making the service derivatives accessible.

Content sampler / viewer

A function for sampling the content of a digital object will be present for all digital object descriptions (parent and component) whenever a digital file is referenced and accessible.

The content sampler should provide access to images, text, sound, and moving image files.

It should show inline a thumbnail of an image or an icon representing other file types. Clicking on the icon should then open the corresponding file in a separate window. If the file location cannot be resolved by the machine and the file cannot be located, an error message should be displayed to the user.

DO--3: Listing digital object records

As with other modules, all digital objects will be able to be listed and variously sorted on a browse page. From left to right, the default data elements included in the list will be:

- Title
- Date (Date expression or date begin / date end pair)

- Digital object ID
- Object type

Users will have the option to re-configure the default display, adding elements from the digital object record, or removing them, or changing their left-to-right sequence.

All the data elements in the digital object browse list will be sortable, and the browse list as a whole will support primary and secondary sorting.

The browse list will also have an associated filter, allowing the list to be narrowed to records corresponding to values entered in the filter frame.

Finally, the browse screen will have the following right-click functions:

- New (for creating a new record)
- Edit (for opening a selected record)
- Delete (for deleting a selected record)
- List all (for listing all the records in the digital object module)
- List selected (for narrowing the browse list to selected, contiguous or non-contiguous, records)
- Omit selected (for removing from the browse list selected, contiguous or non-contiguous, records)

DO—4: Creating / editing / deleting digital object records

Digital object records

A user with appropriate permissions will be able to create, edit, and delete digital objects.

To create a record, the user will click on the **New Record** option or the right-click **New** option, either of which will open an empty digital object record template.

To open a record for editing, the user will either double click on a record in the browse list or highlight the record and then click on the right-click **Edit** option.

To delete a record, the user will select one or more records in the browse list and then click on the Delete option or right click on the Delete option, which will request the user to confirm the intention to delete the record(s).

Digital object components

Digital object components can only be added to or removed from an open digital object record.

To add a digital object component, the user will select the **Add Child** or **Add Sibling** option. If the user chooses to add a child record, the record will be inserted one level down from the context pointer in the hierarchical display. If there are already child records at that level, the new child record will be inserted at the end of the list of the child records. If the user opts to add a sibling record, the record will be inserted at the same level as the context pointer in the hierarchical display but at the end of all records at that level. In either case, the choice to add a child or sibling record will cause a blank digital object component record to appear in the edit portion of the screen.

To delete a component, the user will highlight a node in the hierarchical display and then click on the **Delete Component** option. The user will be asked to confirm the delete request. If confirmed the selected component and all components contained by it will be deleted and will be removed from the hierarchical display.

Should the user choose to delete the parent node or component, the entire digital object record will be deleted and the application will revert to the display list for the digital object records, omitting the just deleted record.

DO--5: Digital object sub-records

Notes

As with Resources, the bulk of description for a digital object is carried in the notes that are linked to the primary digital object / digital object component record.

Each note consists of a note type value (stored name), a configurable label, a field for recording the note text, and an indication if the note is to be published or not.

There are no constraints on the use of notes in the digital object module. No note is required. Also, each digital object record or digital object component record may contain 0 to many occurrences of each note type.

The following note types will be supported for the digital object module

1. Summary
2. Bibliography
3. Biographical/Historical
4. Conditions Governing Access

5. Conditions Governing Use
6. Custodial History
7. Dimensions
8. Edition
9. Extent
10. Existence and Location of Copies
11. Existence and Location of Originals
12. General Note
13. Immediate Source of Acquisition
14. Inscription
15. Language of Materials
16. Legal Status
17. Physical Description
18. Preferred Citation
19. Processing Information
20. Related Materials

The following notes from the resource record are not supported in the digital object module, although the content of some are mapped to digital object notes:

1. Accruals
2. Appraisal
3. Arrangement
4. File Plan
5. Index
6. Location
7. Materials Specific Details
8. Physical Characteristics and Technical Requirements
9. Physical Facet
10. Other Finding Aids
11. Scope and Content
12. Separated Materials

Notes will be listed in the digital object record / digital component record. The list will include from left to right:

- Note type (**Required**)
- Publish (**Required**)
- Note label (if used)
- Note content (**Required**; only the first 25 characters thereof is listed in the digital object / digital object component display of notes. The complete content of a given note is displayed by opening the individual note.)

The columns WILL NOT support sorting. However, a user will be able to modify the vertical sequence of the notes, using a drag and drop technique.

File version

The file version record is for indicating the file containing the digital content. Zero to many file version records may be linked to the a digital object or digital object component record.

The file version record includes the following data elements:

- URI (**Required**)
- Publish (**Required**)
- Use Statement
- Xlink Actuate attribute
- Xlink Show attribute

The file version record will also include a visual representation of the file. For an image file, it will be a thumbnail of the content of the image file. For non-image files, it will be a thumbnail size icon representing the file / content type, e.g. videorecording, text, musical sound recording, non-musical sound recording.

The file version record will also include two functions. One is for opening the referenced file in a separate screen. The other function is for recording technical metadata about the file, described just below.

There will be a frame for displaying in the file version sub-record the three required technical metadata elements: file format name, file date of creation, and file size (sequenced left-to-right in that order). Double clicking on one of the displayed elements will open the complete technical metadata record for editing. As part of the frame for displaying the file metadata record, there will be a function for adding a file metadata record and a function for removing it. If a file metadata record has already been linked to the file version sub-record, then the option to add a file metadata record will not be active. If a file metadata record has not been added to the file version sub-record, then the option to remove a file metadata record will not be active.

Finally, file versions will be listed in the context of the digital object record, in the manner that other sub-records are listed throughout the application. The left to right sequence for the list shall be:

- File URI
- File Use Statement
- File Representation (a thumbnail of the content of an image file, or an icon representing non-image files types, e.g., musical sound recording, non-musical sound recording, videorecording, and text files.

The File Use Statement and File URI columns will support primary and secondary sorting.

File metadata (per each file version)

Each file version may have 0 or 1 technical metadata records linked to it. The technical metadata is for recording technical characteristics of the file and are intended to assist in ensuring the authenticity and preservation of the file over time.

The elements, based on PREMIS object descriptors, are:

- File format name (**REQUIRED**)
- File format version
- File format registry ID
- Date file created (**REQUIRED**)
- File size (**REQUIRED**)
- Checksum
- Checksum method
- Name of file creating application
- Version of file creating application

DO--6: Linking Digital Object Records

The digital object record may be linked to zero-to-many name records and subject records. The digital object may be linked to, from within the context of an open accession or resource record (linked from) or from within the context of an open digital object record (linked to), as described below.

- The digital object record may be linked to-from one accession record. If linked to-from an accession record, the digital object record will not be available for linking to other accession records.
- The digital object record may be linked to-from one resource / resource component record. If it is linked to-from a resource or resource component record, the digital object will not be available for linking to other resource / resource component records.
- The digital object may be linked to one accession record and one resource / resource component record. If the digital object record is already linked to an accession record and/or resource / resource component record, it will not be possible to link it to an additional accession and/or resource / resource component record.

Note: many digital objects may be linked to the same accession, resource, or resource component record.

DO--7: Transforming Resource / Resource Component Data to Digital Object

Just as an accession record may be used to “spawn” a resource record, a resource record or resource component record may be used to “spawn” a digital object record, which will then be linked to the resource / resource component record from which it was spawned.

The linked digital object will then be reflected in exports of the resource data (i.e., the EAD will have a <dao> for the digital object), and the linked resource record will be reflected in the record exported for the digital object (e.g., a <relatedItem> element in MODS record).

To “spawn” a digital object record from a resource or resource component record, the user will elect to add a digital object instance from within an open resource or resource component record. The content for the fields identified below will populate the new digital object record, which will be an invalid digital object record until the user provides the digital object ID.

Resource / Resource Component field	Digital object field
Resource Title	Digital Object Title
Resource Date Expression	Digital Object Date Expression
Resource Date Begin	Digital Object Date Begin
Resource Date End	Digital Object Date End
Resource Language	Digital Object Language

Resource Note Type	Digital Object Note Type
Abstract	Summary
Bibliography	Bibliography
Biographical/Historical	Biographical/Historical
Conditions Governing Access	Conditions Governing Access
Conditions Governing Use	Conditions Governing Use
Custodial History	Custodial History
Dimensions	Dimensions
Existence and Location of Copies	Existence and Location of Copies
Existence and Location of Originals	Existence and Location of Originals
General Note	General Note
General Physical Description	Physical Description
Immediate Source of Acquisition	Immediate Source of Acquisition
Language of Materials	Language of Materials
Legal Status	Legal Status
Material Specific Details	Physical Description
Physical Characteristics and Technical Requirements	Physical Description
Physical Facet	Physical Description
Preferred Citation	Preferred Citation
Processing Information	Processing Information
Related Archival Materials	Related Materials
Scope and Contents	Summary
Accruals	Do not transform to digital object record
Appraisal	Do not transform to digital object record
Arrangement	Do not transform to digital object record
Bibliography	Do not transform to digital object record
File Plan	Do not transform to digital object record
Index	Do not transform to digital object record
Location	Do not transform to digital object record
Other Finding Aids	Do not transform to digital object record
Separated Materials	Do not transform to digital object record
Resource Sub-Records	Digital Object Sub-Records
Date sub-record	Date sub-record
Resource Linked Records	Digital Object Linked Records
Name records	Name records
Subject records	Subject records

In addition to the notes above that will not be transferred to the digital object record, no multi-part, structured data notes will be transferred to the digital object record, since multi-part notes are not supported in the exports for digital records.

When there is a multipart note in the source Resource record (or resource component record) of a type which would normally be brought into a digital object record, the user should be notified that the note was not transferred because it is a multipart note. This message should be shown immediately after the DO record is spawned.

The message text should be as follows:

"The following note(s) were not added to the Digital Object record:
[note type]"

The message should have three buttons; an "OK" button which closes the message, a "Print" button and a "Save" button.

DO--8: Business rules

1. The application will support the description of simple and complex, multi-level digital objects that are 1) surrogates/reproductions of materials described in a resource description and, thus, linked to a resource record or 2) are independent and not linked to a resource record
2. A valid digital object record must have:
 - a. Digital object ID unique within repository context
 - b. Title (if Date sub-record is not used)
 - c. Date sub-record (if Title element is not used)
3. A digital object record can be composed of many components and sub-records (see DO-5), each having its own requirements for validity:
 - a. Unlimited number of component records with an unlimited hierarchy, all representing the logical and/or physical structure of the digital object, each occurrence requiring:
 - i. Title (if Date sub-record or Label element are not used)
 - ii. Date sub-record (if Title element or Label element are not used)
 - iii. Label (if Title element or Date sub-record are not used)
 - b. A note sub-record, each requiring:
 - i. Note type

- ii. Note content
- c. A file version sub-record for pointing to the digital file containing the content described, requiring
 - i. URI pointer
- d. A file version object metadata sub-record for recording technical characteristics of the digital file, requiring
 - i. File format name
 - ii. File date created
 - iii. File size

A digital object record must be linked to a repository record, but that link may be modified subsequently

- 4. A digital object may be linked to the following records:
 - a. Name records
 - b. Subject records
- 5. A digital object may be linked to, one time only, from an accession record and from a resource / resource component record.
 - a. If a digital object is linked to from an accession record, it will not be available for linking to from any other accession records.
 - b. If a digital object is linked to from a resource record, it will not be available for linking to from any other resource records.
 - c. If a digital object is linked to from a resource component record, it will not be available for linking from any other resource component record within the same resource record, or within a different resource record.
- 6. A digital object may be generated (“spawned”) from a resource or resource component record, transferring specified data from the resource or resource component to the digital object record, including all linked name and subject records
- 7. A user may be able to import a CSV formatted file containing digital object and digital object component records. Each digital object record may be subsequently linked to from accession or resource / resource component records

8. Digital object records may be exported as:
 - a. Dublin Core records
 - b. MARCXML records
 - c. MODS records
 - d. VRA records
 - e. METS records (containing either MODS, Dublin Core, or VRA descriptive metadata and PREMIS technical metadata)
9. The reports specified in DO-15 can be generated for digital objects
10. The default setting is to publish digital objects and all parts thereof. However, a digital object record in its entirety, one or more of its components, one or more of its notes, and one or more file versions within a digital object may be suppressed by changing the value of the Publish element to “False”. When choosing to suppress a digital object component, all notes linked to that digital object component and file version sub-records, as well as all other digital object components, notes, and sub-records contained within that suppressed digital object component will not be displayed.

DO--9: Required task sequence

1. Select the function in the Digital Object module to create a new digital object record or the function in the resource record to “spawn” a digital object record
2. Record digital object ID
3. Record digital object title, if title is to be used and title has not been transferred from a source resource record (title is required if date sub-record is not used)
4. Record digital object date(s), if dates are to be used and dates have not been transferred from the source resource record (date sub-record is required if title is not used)
5. Save the digital object record

DO--10: Optional task sequence

1. Record additional information for Level, Language, Object Type, XLink Actuate and Show, and Restrictions elements
2. Add component digital object records (each component record requires Title or Label element or Date sub-record)
3. Indicate file versions at digital object and/or digital object component levels (each file version sub-record requires a file URI)
4. Record file technical metadata for each file version indicated in the digital object record. (Each file metadata record requires File Format Name, File Date Created, and File Size elements.)
5. Link name records to digital object parent and/or digital object components
6. Link subject records to digital object parent and/or digital object components
7. Change the value to “False” for the Publish element on the digital object parent level or any digital object component, file version sub-record, or note within the digital object record

DO--11: User intentions / Application response sequence

1: Digital Object Parent Record:

User intention (Required fields in <i>italics</i>)	Application response / action
<p><i>Select option in digital object module to create new digital object record, or select option, from within a resource / resource component record, option to create a digital object instance of the open resource / resource component record</i></p>	
	<p>If creating a new digital object record, application opens a digital object record, with all fields blank. Parent node is represented in the digital object record hierarchical display.</p>

	If spawning a new digital object instance, the application opens a digital object record with data inherited from the source resource / resource component record, and showing a link to the source resource / resource component record. Parent node is represented in the digital object record hierarchical display, with title information inherited from source resource / resource component record.
<i>Record a unique digital object ID</i>	
	The application will indicate if the digital object ID is not unique: “Digital object ID is not unique. Please enter a unique digital object ID.”
<i>Record a title, unless inherited already from source resource record or unless title will not be used. Title is required if date sub-record is not used.</i>	
<i>Record a date, unless date inherited already or dates will not be used. Date(s) are required if title element is not used.</i>	
Record optional data elements	
Add digital object component records (see below)	
Add note sub-records (see below)	
Add file version sub-records (see below)	
Add file metadata sub-records (see below)	
Link name records	
Link subject records	
<i>Save digital object record</i>	

	Application will indicate the digital object record cannot be saved and display the reason, typically because the record lacks one of the required data elements.
	Otherwise, application will indicate record has been saved, and new digital object will be added to the digital object browse list or new digital object instance will be represented in the instance list of source resource / resource component record.

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select digital object record to edit in digital object browse list</i>	
	Application opens digital object record with all previously recorded data and linked records
Modify data	
<i>Save record</i>	
	Application will indicate the digital object record cannot be saved and display the reason, typically, because the record lacks one of the required data elements.
	Otherwise, application will indicate record has been saved, and new digital object will be added to the digital object browse list or new digital object instance will be represented in the instance list of source resource / resource component record.

User intention (Required fields in <i>italics</i>)	Application response / action
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<i>italics)</i>	
Select digital object record(s) to delete from list of digital object records	
Select option to delete selected record(s)	
	The application responds: “Are you sure you want to delete “N” digital object records?” Yes / No
Select “Yes” option	
	Selected digital object record(s) are deleted and no longer appear in the list of digital objects
Select “No” option	
	Application reverts to state it was at before delete request was initiated.

2: Digital Object Child Record:

User intention (Required fields in <i>italics)</i>	Application response / action
Select option in digital object record to add child or sibling digital object record	
	Application opens blank digital object component record and adds component at appropriate place in the digital object hierarchical display.
Record a title. Title is required if date sub-record and Label element are not used.	
Record a date. Date(s) are required if title element and Label element are not used.	

<i>Record a label. Label is required if Title element and Date(s) sub-record are not used.</i>	
Record optional data elements	
Add note sub-records (see below)	
Add file version sub-records (see below)	
Add file metadata sub-records (see below)	
Link name records	
Link subject records	
<i>Save digital object record</i>	
	Application will indicate the digital object record cannot be saved and display the reason, typically because the record lacks one of the required data elements.
	Otherwise, application will indicate record has been saved, and new digital object will be added to the digital object browse list or new digital object instance will be represented in the instance list of source resource / resource component record.

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select digital object record to edit in digital object browse list</i>	
	Application opens digital object record with all previously recorded data and linked records
<i>Select digital object component in hierarchical display that to edit</i>	

	Application opens corresponding digital object component record with all previously recorded data and linked records
Modify data	
<i>Save record</i>	
	Application will indicate the digital object record cannot be saved and display the reason, typically because the record lacks one of the required data elements.
	Otherwise, application will indicate record has been saved

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select digital object record component in digital object record to delete from an open digital object record</i>	
<i>Select option to delete selected component</i>	
	The application responds: “Are you sure you want to delete the selected component(s)? The component and all components it contains will be deleted.” Yes / No
<i>Select “Yes” option</i>	
	Selected digital object component(s) are deleted and no longer appear in the hierarchical digital object display

<i>Select "No" option</i>	
	Application reverts to the state it was at before the delete request was initiated.

3: Note Sub-record:

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select option in digital object or digital object component record to add a note</i>	
	Application opens pull down list of available note types
<i>Select the note type to be added</i>	
	Application opens a note record template, with the note type selected indicated.
Record a label for the note. (If label is not recorded, note type will be used as the label where needed.)	
<i>Record the text of the note.</i>	
<i>Save the note sub-record</i>	
	Application will indicate the note sub-record cannot be saved, probably because the note text field is empty.
	Otherwise, application will indicate note sub-record has been saved, and note sub-record will be listed in the note display area for the digital object or digital object component record to which note sub-record was added.

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select note sub-record to edit in list of notes for digital object or digital object component record</i>	
	Application opens selected note sub-record
Modify note label or note text as desired.	
<i>Save note sub-record</i>	
	Application will indicate the note sub-record cannot be saved, probably because the note text field is empty.
	Otherwise, application will indicate note record has been saved

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select one or more notes in list of notes in a digital object or digital object component record to delete.</i>	
<i>Select option to delete selected note sub-record(s)</i>	
	The application responds: “Are you sure you want to delete the selected note(s)?” Yes / No
<i>Select “Yes” option</i>	
	Selected note(s) are deleted and no longer appear in the list of notes for digital object / digital object component record.

Select "No" option	
	Application reverts to the state it was at before the delete request was initiated.

4: File version sub-record

User intention (Required fields in <i>italics</i>)	Application response / action
Select option in digital object or digital object component record to add a file version sub-record	
	Application opens template for the file version sub-record
Enter the URI for the digital file	
Record a use statement for the digital file	
Record the xlink actuate and show attributes for the digital file.	
Save the file version sub-record	
	Application will indicate the file version sub-record cannot be saved, probably because the file URI has not been recorded.
	Otherwise, application will indicate file version sub-record has been saved, and file version sub-record will be listed in file version area for digital object or digital object component record to which the file version sub-record was added.

User intention (Required fields in	Application response / action
------------------------------------	-------------------------------

<i>italics)</i>	
Select file version sub-record to edit in list of file versions for the digital object or digital object component record	
	Application opens selected file version sub-record
Modify file version sub-record as desired.	
Save file version sub-record	
	Application will indicate the file version sub-record cannot be saved, probably because the file URI has not been recorded.
	Otherwise, application will indicate file version sub-record has been saved

User intention (Required fields in <i>italics)</i>	Application response / action
Select one or more file version sub-records in the list of file version sub-records for a digital object or digital object component record to delete .	
Select option to delete selected file version sub-record(s)	
	The application responds: "Are you sure you want to delete the selected file version(s)?" Yes / No
Select "Yes" option	
	Selected file version sub-record(s) are deleted and no longer appear in the list of

	file version sub-record(s) for digital object / digital object component record.
Select "No" option	
	Application reverts to the state it was at before the delete request was initiated.

5: File metadata sub-record

User intention (Required fields in <i>italics</i>)	Application response / action
Select option in the file version sub-record to add file metadata	
	Application opens a blank template for the file metadata
Record the name of the file format	
Record the file date of creation	
Record the file size	
Record additional file metadata: format version, format registry ID, checksum, checksum type, and name and version of application used to create the file.	
Save the file metadata sub-record	
	Application will indicate the file metadata sub-record cannot be saved, probably because either the file format name, file date of creation, or file size has not been recorded
	Otherwise, application will indicate file metadata sub-record has been saved, and file metadata sub-record will be listed in

	the file metadata sub-record display area in the file version sub-record.
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User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select file metadata sub-record to edit in file version sub-record</i>	
	Application opens selected file metadata sub-record
Modify file metadata sub-record as desired.	
<i>Save file metadata sub-record</i>	
	Application will indicate the file metadata sub-record cannot be saved, probably because it lacks either the file format name, file date created, or file size elements.
	Otherwise, application will indicate the file metadata sub-record has been saved

User intention (Required fields in <i>italics</i>)	Application response / action
<i>Select option to delete the file metadata sub-record in file version sub-record</i>	
	The application responds: “Are you sure you want to delete the file metadata record?” Yes / No
<i>Select “Yes” option</i>	

	File metadata record is deleted and no longer appears in the file version sub-record
<i>Select "No" option</i>	
	Application reverts to the state it was at before the delete request was initiated.

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DO--12: Digital Object Data elements

Element	Definition	Type	Default Values	Required
digitalObjectID	<p>Within the repository domain, a unique identifier for the digital object as a whole. May be an ARK, HANDLE, or any string that uniquely identifies the digital object.</p> <p>Value is not case sensitive. "A" and "a" equals a match.</p>	String		Yes
digitalObjectPublish	<p>For indicating if the digital object record and its referenced digital content is to be published or not. Available on the digital object and digital object component records.</p>	Boolean	True	Yes
digitalObjectDescLevel	<p>Primarily for use in multi-level VRA compliant records in order to indicate description is about a collection, a work, or an image.</p>	Config pull down	<ul style="list-style-type: none"> • Collection • Work • Image 	
digitalObjectTitle	<p>A title expression for the digital object. May be transcribed from the object, or inherited from a source resource/resource component record, or provided by the repository</p>	String		Yes, if Date Expression or Date Begin / Date End pair are not used
digitalObjectType	<p>A generic term indicating the basic content type of the digital object.</p>	Config pull down	<ul style="list-style-type: none"> • Cartographic • Mixed 	

			materials <ul style="list-style-type: none"> • Moving image • Notated music • Software, multimedia • Sound recording • Sound recording-musical • Sound recording-nonmusical • Still image • Text 	
digitalObjectLanguage	The language for the digital content	String		
digitalObjectRestrictions	An indication if restrictions apply or not	Boolean		
digitalObjectLabel	A description of the part of the digital object (e.g., page, section, chapter, part 1 of 4, etc.)	String		

digitalObjectComponentID	A field for identifying separate parts of the digital object uniquely. Value is not case sensitive.			
digitalObjectActuate	An attribute, used in EAD, for indicating how a link to a digital object is to behave	Non-config pull down	<ul style="list-style-type: none"> • none • onLoad • onRequest • other 	
digitalObjectShow	An attribute, used in EAD, for indicating how the digital object should display	Non-config pull down	<ul style="list-style-type: none"> • embed • new • none • other • replace 	
digitalObjectRecordCreatedTimestamp		Timestamp		Yes
digitalObjectRecordLastModified		Timestamp		Yes

dTimestamp				
digitalObjectRecordCreatedStaff		String		Yes
digitalObjectRecordLastModifiedStaff		String		Yes
digitalObjectRecordCreatedTimestamp		Timestamp		Yes

Element	Definition	Type	Default Values	Required
noteType	The type of note for the content. Note types are used for guiding export of note contents to certain elements in specific data formats	Non-config pull down	<ol style="list-style-type: none"> 1. Summary 2. Bibliography 3. Biographical/Historical 4. Conditions Governing Access 5. Conditions Governing Use 6. Custodial History 7. Dimensions 8. Edition 9. Extent 10. Existence and Location of Copies 11. Existence and Location of Originals 12. General Note 13. Immediate Source of Acquisition 14. Inscription 15. Language of Materials 16. Legal Status 17. Physical Description 18. Preferred Citation 	Yes

			19. Processing Information 20. Related Materials	
notetPublish	For indicating if the note is to be published or not	Boolean	True	Yes
noteLabel	A label for the specific note. If a label is not use the note type will be used as the label wherever required	String		
noteContent	The content of the note.	String		Yes

Element	Definition	Type	Default Values	Required
fileVersionURI	An identifier to the digital file as accessible on the web or in a file directory. Value is not case sensitive.	String		Yes
fileVersionPublish	For indicating if the digital object content file referenced by the URI is to be published or not	Boolean	True	Yes

fileVersionUse	A descriptor indicating the use for which the digital file is intended (e.g., a thumbnail)	Con-fig pull down	<ul style="list-style-type: none"> • Application-PDF • Application-PS • Audio-Master • Audio-Master-Edited • Audio-Service • Audio-Streaming • Audio-Clip • Image-Master • Image-Master-Edited • Image-Service • Image-Service-LowRes • Image-Service-MedRes • Image-Service-HighRes • Image-Service-Edited • Image-Thumbnail • Text-OCR-Edited • Text-OCR-Unedited • Text-Service • Text-Master • Text-TEI-Translated • Text-TEI-Transcribed • Text-Georeference • Text-Data • Text-Data Definition • Text-Codebook • Video-Master • Video-Master-Edited • Video-Service • Video-Streaming • Video-Clip 	
fileVersionActuate	An attribute, used in EAD, for indicating how the digital object should display	Non-config pull down	<ul style="list-style-type: none"> • embed 	

			<ul style="list-style-type: none"> • new • none • other • replace 	
fileVersionShow	An attribute, used in EAD, for indicating how the digital object should display	Non-config pull down	<ul style="list-style-type: none"> • embed • new • none • other • replace 	

Element	Definition	Type	Default Values	Required
fileFormatName	The name of the format for the file type (e.g., TIFF)	Config pull dow	<ul style="list-style-type: none"> • AIFF – Audio Interchange File Format • AVI – Audio/Video Interleaved Format • GIF – Graphics Interchange Format • JPG – JPEG File Interchange 	Yes

			Format <ul style="list-style-type: none"> • MP3 – MPEG ½ Audio Layer 3 • PDF – Portable Document Format • TIFF – Tagged Image File Format • TXT – Plain Text File 	
fileFormatVersion	The version of the format for the file type (e.g. TIFF 5.0 or TIFF 6.0)	String		
fileFormatRegistryID	The identifier assigned to the file format in a file registry	String		
fileDateCreated	The date the file was created	Date		Yes
fileSize	The size (in bytes) of the digital file	String		Yes
fileChecksum	A digital signature for monitoring the integrity and authenticity of a digital file	String		

fileChecksumMethod	The algorithm used for generating checksums	Config pull down	<ul style="list-style-type: none"> • CRC32 • MD5 • SHA-1 	
fileCreatingApplication	The name of the application used to create the digital file	String		
fileCreatingApplicationVersion	The version of the application use to create the digital file	String		

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Digital object data, parent and component, in tab-delimited format will be supported.

Digital object parent records:

Import of Digital Object should follow these rules:

1. Each row in the import file will create a Digital Object record.
2. The Digital Object ID must be unique within the repository context for the data to import.
 - a. If the Digital Object ID for a source record is already in the database, the source record will not be imported.
 - b. If the Digital Object ID is not unique, the user will be informed in the import log that the item already exists
3. File Version data will spawn a File Version and a file metadata record, which will be attached to the parent level of the Digital Object record.
4. There can only be one of each type of associated or linked record per Digital Object (i.e., only one Date, File Version, File Metadata, Name, and Subject record).

Import Field/Column Header	Where Stored in Application	Data Type	Rule
DO			
Digital Object ID	digitalObjectID	String	Required
dateBegin	Date Sub-Record	Integer	Required (or title or date expression)
dateEnd	Date Sub-Record	Integer	Required (or title or date expression)
dateExpression	Date Sub-Record	String	Required (or title or date begin/end)
xLinkActuate	digitalObjectActuate	String	
xLingShow	digitalObjectShow	String	
Level	digitalObjectDescLevel	String	
Label	digitalObjectLabel	String	
Language	digitalObjectLanguage	String	
objectType	digitalObjectType	String	
restrictionsApply	digitalObjectRestrictions	Boolean	
Title	digitalObjectTitle	String	Required (or date expression or date begin/end)
File Version			
xLinkActuate	fileVersionActuate	String	
xLinkShow	fileVersionShow	String	
uri	fileVersionURI	String	Required (for creation of a File Version)
useStatement	fileVersionUseStatement	String	
File Metadata			
format	fileFormatName	String	Required if sub-record

			is used
formatVersion	fileFormatVersion	String	
formatRegistryID	fileFormatRegistryID	String	
dateCreated	fileDateCreated	String	Required if sub-record is used
fileSize	fileSize	String	Required if sub-record is used
checksumValue	fileChecksum	String	
checksumMethod	fileChecksumMethod	String	
creatingApp	fileCreatingApplication	String	
creatingAppVersion	fileCreatingApplicationVersion	String	
Subject & Names			
[subjects as in accessions tab delimited import]	[subjects as in accessions tab delimited import]		
[names as in accessions tab delimited import]	[names as in accessions tab delimited import]		
Notes	[Note Type]		
summary	Summary		
Bibliography	Bibliography		
biographicalHistorical	Biographical/Historical		
conditionsGoverningAccess	Conditions Governing Access		
conditionsGoverningUse	Conditions Governing Use		
custodialHistory	Custodial History		
Dimensions	Dimensions		
edition	Edition		
extent	Extent		
existenceLocationCopies	Existence and Location of Copies		
existenceLocationOriginals	Existence and Location of Originals		
generalNote	General Note		
sourceAcquisition	Immediate Source of Acquisition		
Inscription	Inscription		
Languageofmaterials	Language of materials		
legalStatus	Legal Status		
physicalDescription	Physical Description		
preferredCitation	Preferred Citation		
processingInformation	Processing Information		
relatedMaterials	Related Archival Materials		

Digital object component records:

Import of Digital Object should follow the following rules:

1. The Digital Object ID must match a digital object already stored in the database
2. Each row in the source data will spawn a Digital Object component record with, if applicable a File Version, Name, Subject and Note data, all of which will be linked to the target digital object record
3. The component record will be the direct child of the top level record, so there will be only be two levels of hierarchy – parent and children. Additional hierarchy will need to be added post-import of the digital object components
4. There can only be one of each type of associated record per Digital Object component, i.e., only one Date, File Version, File metadata, Name, and Subject.

Import Field/Column Header	Where Stored in Application	Data Type	Rule
DO			
digitalObjectID	digitalObjectID	String	Required; targets a digital object already in the database. Import will fail if not there is no digital object in the database with the specified digital object ID
componentID	digitalObjectComponentID	String	
dateBegin	Date sub-record	Integer	Required (or title or date expression or label)
dateEnd	Date sub-record	Integer	Required (or title or date expression or label)
dateExpression	Date sub-record	String	Required (or title or date begin/end or label)
label	digitalObjectLabel	String	Required (or title or date begin/end or date expression)
language	digitalObjectLanguage	String	
title	digitalObjectTitle	String	Required (or date expression or date begin/end or label)
File Version			
xLinkActuate	fileVersionActuate	String	
xLinkShow	fileVersionShow	String	
uri	fileVersionuri	String	Required (for creation of a File Version)
useStatement	fileVersionUseStatement	String	Required (for creation of a File Version)
File Metadata			
format	fileFormatName	String	
formatVersion	fileFormatVersion	String	
formatRegistryID	fileFormatRegistryID	String	
dateCreated	fileDateCreated	String	
fileSize	fileSize	String	
checksumValue	fileChecksum	String	

checksumMethod	fileChecksumMethod	String	
creatingApp	fileCreatingApplication	String	
creatingAppVersion	fileCreatingApplicationVersion	String	
Subject & Names			
[subjects as in accessions tab delimited import]	[subjects as in accessions tab delimited import]		
[names as in accessions tab delimited import]	[names as in accessions tab delimited import]		
Notes	[Note Type]		
Summary	Summary		
Bibliography	Bibliography		
biographicalHistorical	Biographical/Historical		
conditionsGoverningAccess	Conditions Governing Access		
conditionsGoverningUse	Conditions Governing Use		
custodialHistory	Custodial History		
Dimensions	Dimensions		
edition	Edition		
extent	Extent		
existenceLocationCopies	Existence and Location of Copies		
existenceLocationOriginals	Existence and Location of Originals		
generalNote	General Note		
sourceAcquisition	Immediate Source of Acquisition		
Inscription	Inscription		
Languageofmaterials	Language of materials		
legalStatus	Legal Status		
physicalDescription	Physical Description		
preferredCitation	Preferred Citation		
processingInformation	Processing Information		
relatedMaterials	Related Archival Materials		

The following is a sample of Digital Object component import file. It illustrates the import of files which are part of a single, multipage item, like a book.

	A	B	C	D	E	F
	digitalObjectID	uri	use Statement	dateCreated	creatingApp	label
1						
2	MSS682_23	MSS682_23_0001	Image-Master	12/10/2007	Photoshop CS3	Page 1
3	MSS682_23	MSS682_23_0002	Image-Master	12/10/2007	Photoshop CS3	Page 2
4	MSS682_23	MSS682_23_0003	Image-Master	12/10/2007	Photoshop CS3	Page 3
5	MSS682_23	MSS682_23_0004	Image-Master	12/10/2007	Photoshop CS3	Page 4
6	MSS682_23	MSS682_23_0005	Image-Master	12/10/2007	Photoshop CS3	Page 5
7	MSS682_23	MSS682_23_0006	Image-Master	12/10/2007	Photoshop CS3	Page 6
8	MSS682_23	MSS682_23_0007	Image-Master	12/10/2007	Photoshop CS3	Page 7
9	MSS682_23	MSS682_23_0008	Image-Master	12/10/2007	Photoshop CS3	Page 8
10	MSS682_23	MSS682_23_0009	Image-Master	12/10/2007	Photoshop CS3	Page 9
11	MSS682_23	MSS682_23_0010	Image-Master	12/10/2007	Photoshop CS3	Page 10
12	MSS682_23	MSS682_23_0011	Image-Master	12/10/2007	Photoshop CS3	Page 11
13	MSS682_23	MSS682_23_0012	Image-Master	12/10/2007	Photoshop CS3	Page 12
14	MSS682_23	MSS682_23_0013	Image-Master	12/10/2007	Photoshop CS3	Page 13
15	MSS682_23	MSS682_23_0014	Image-Master	12/10/2007	Photoshop CS3	Page 14
16	MSS682_23	MSS682_23_0015	Image-Master	12/10/2007	Photoshop CS3	Page 15
17	MSS682_23	MSS682_23_0016	Image-Master	12/10/2007	Photoshop CS3	Page 16
18	MSS682_23	MSS682_23_0017	Image-Master	12/10/2007	Photoshop CS3	Page 17
19	MSS682_23	MSS682_23_0018	Image-Master	12/10/2007	Photoshop CS3	Page 18
20	MSS682_23	MSS682_23_0019	Image-Master	12/10/2007	Photoshop CS3	Page 19
21	MSS682_23	MSS682_23_0020	Image-Master	12/10/2007	Photoshop CS3	Page 20

Importing of digital object records and digital object component records will conclude with a log or report of the import results. The log will indicate, at least:

- Number of digital object records imported
- Number of digital object component records imported
- Number of digital object / digital object component records that failed to import and reason why (e.g., duplicate Digital Object ID)

DO--14: Exports

The following digital object exports will be supported:

- METS (MODS)
- METS (Dublin Core)
- METS (VRA)
- Dublin Core
- MARCXML

- MODS
- VRA

Exports may be done singly or in batches. Thus the export functions will be available on the digital object template (for exporting an open digital object record) and on the digital object browse screen (for exporting batches of digital objects).

DO--15: Reports

Digital object list: title, digital object identifier, digital object type, digital object dates, and creators

Digital object record(s): title, digital object identifier, digital object type, digital object dates, associated names and subjects, linked resources (In record format)

Digital object table: title, digital object identifier, digital object type, digital object dates, associated names and subjects, linked resources (In table format)

File versions: digital object title, digital identifier, and associated file versions