

|  |   |
|--|---|
| 1. 5. DCS Business Object Ontology ..... | 2 |
| 1.1 5.1. Project Model .....             | 2 |
| 1.2 5.2. Collection Model .....          | 3 |
| 1.3 5.3. Data Item model .....           | 4 |
| 1.4 5.4. Data File model .....           | 5 |
| 1.5 5.5. Metadata File model .....       | 5 |

# 5. DCS Business Object Ontology

The DCS operates on a set of object models called Business Objects. This section enumerates the types of Business Objects and describes the relationships supported amongst them. In addition to the specified relationships, relationships that do not violate the described cardinalities/constraints may be captured through a generic relationship mechanism.

For data packaging purposes, each object type can be represented as a [ORE Resource Map](#) under the resource map profile explained [here](#). The tables for each object type indicate the mapping between the properties and relationships of the object models and their corresponding ORE ReM representations. Some properties and relationships are not included in the ReMs; therefore, they have no ORE-ReM representation.

## 5.1. Project Model

## 5.2. Collection Model

## 5.3. Data Item model

## 5.4. Data File model

## 5.5. Metadata File model

## 5.1. Project Model

### Project

#### Usage

Generally speaking, a Project is meant to align with a topic or area of sponsored research (e.g. a grant, or faculty research project). It records information important to data managers, such as the sponsors of a project, the administrators (e.g. the Principle Investigators and/or their proxies), and the beginning and end dates of the research project.

#### Model

| Property                | Cardinality | ORE-ReM representation | Usage  |
|-------------------------|-------------|------------------------|--|
| Id                      | (1,1)       | dcterms:identifier     | Generated by the system during ingest (via package ingest) or creation (via the DCS Front End) |
| Name                    | (1,1)       | dcterms:title          | Brief textual title for the Project  |
| Description             | (1,1)       | dcterms:description    | Textual description of the Project   |
| Funding Entity          | (0,1)       |                        | Identifies funder  |
| Numbers                 | (0,*)       |                        | Award or other funding "numbers".  |
| Principal Investigators | (0,*)       |                        | Identities (names) of principal investigators  |
| Publisher               | (1,1)       |                        |  |
| Start Date              | (1,1)       |                        | The start date of the Project  |
| End Date                | (0,1)       |                        | The end date of the Project  |
| Storage Allocated       | (1,1)       |                        | Storage space allotted to the Project in the system  |

|              |       |  |   |
|--------------|-------|--|---|
| Storage Used | (1,1) |  | Storage space taken up by the Project's data. |
|--------------|-------|--|---|

| Relationship name | Cardinality | Targets    | ORE-ReM representation | Usage   |
|-------------------|-------------|------------|------------------------|---|
| hasMember         | (0,*)       | Collection | ore:aggregates         | Represents the relationship between the Project and its children Collections. |

## 5.2. Collection Model

### Usage

A Collection is an aggregation of Data Items (or simply, Items). The Collection maintains metadata that pertain to the aggregated Items and the Collection itself. Collections may be published and cited. Collections can contain multiple sub-collections. A Collection belongs to a single Project.

### Model

| Property         | Cardinality | ORE-ReM representation              | Usage  |
|------------------|-------------|-------------------------------------|--|
| Id               | (1,1)       | dcterms:identifier<br>ore:similarTo | Generated by the system during ingest (via package ingest) or creation (via the DCS Front End) |
| Alternate Id     | (0,*)       | dcterms:identifier                  | Alternate Id for the Collection  |
| Title            | (0,1)       | dcterms:title                       | Short title of the collection  |
| Summary          | (0,1)       | dcterms:description                 | A summary description of the Collection's content  |
| Discipline       | (0,*)       | dcterms:subject                     | A term of a vocabulary identifying the discipline which the Collection is associated with      |
| Citable Locator  | (0,*)       | datacons:citableLocator             | Unique id which could be used to cite the Collection and its content.                          |
| Creator          | (0,*)       | dcterms:creator                     | Contain information about the Collection's creator(s)  |
| Creator Name     | (0,1)       | dcterms:creator/foaf:name           | Cardinality is per creator   |
| Creator Phone    | (0,*)       | dcterms:creator/foaf:phone          | Cardinality is per creator   |
| Creator Email    | (0,*)       | dcterms:creator/foaf:mbox           | Cardinality is per creator   |
| Creator Page     | (0,*)       | dcterms:creator/foaf:page           | Cardinality is per creator   |
| Contact          |             | scoro:contact_person                | Contain information about the designated point of contact for the Collection                   |
| Contact Name     | (0,1)       | scoro:contact_person/foaf:name      | Cardinality is per contact   |
| Contact Phone    | (0,*)       | scoro:contact_person/foaf:phone     | Cardinality is per contact   |
| Contact Email    | (0,*)       | scoro:contact_person/foaf:mbox      | Cardinality is per contact   |
| Publication Date | (0,1)       | dcterms:issued                      | Date on which the Collection is published  |
| Create Date      | (1,1)       | dcterms:created                     | Date on which the Collection was first created   |
| Modified Date    | (1,1)       | dcterms:modified                    | Date on which the Collection's information is updated  |
| Deposit Date     | (1,1)       |                                     | Date on which the Collection is deposited - system generated upon ingest                       |
| Depositor Id     | (1,1)       |                                     | Identifier of the user who deposited the Collection - system generated upon ingest             |

| Relationship name | Cardinality | Targets                 | ORE-ReM                                | Usage   |
|-------------------|-------------|-------------------------|--|---|
| hasMember         | (0,*)       | Collection OR Data Item | ore:aggregates                         | Represents the relationship between a Collection and its children Collection or its children Data Items |
| isMemberOf        | (1,1)       | Collection OR Project   | ore:isAggregatedBy<br>dcterms:isPartOf | Represents the relationship between a Collection and its containing Collection or Project               |
| hasMetadata       | (0,*)       | MetadataFile            |  | Represents the relationship between a Collection and its MetadataFile                                   |

## 5.3. Data Item model

### Usage

Data Items (Items) are the unit of deposit, and serve as a container for describing the file or files contained therein. Items must be deposited to a Collection; currently an Item can only be a member of a single Collection, and they cannot be moved between Collections. In this release, Data Items contain multiple data files.

### Model

| Property        | Cardinality | ORE-ReM representation              | Usage  |
|-----------------|-------------|-------------------------------------|--|
| Id              | (1,1)       | dcterms:identifier<br>ore:similarTo | Generated by the system during ingest (via package ingest) or creation (via the DCS Front End) |
| Alternate Id    | (0,*)       | dcterms:identifier                  | Alternate Ids of the Data Item   |
| Name            | (0,1)       | dcterms:title                       | A descriptive label of the Data Item   |
| Description     | (0,1)       | dcterms:description                 | A summary description of the Data Item's content   |
| Citable Locator | (0,*)       | datacons:citableLocator             | Unique id which could be used to cite the Data Item and its content.                           |
| Content Model   | (0,*)       | dcterms:conformsTo                  | Content models to which a given manifestation of a Data Item conforms.                         |
| Creator         | (0,*)       | dcterms:creator                     | Contain information about the Data Item creator(s)   |
| Creator Name    | (0,1)       | dcterms:creator/foaf:name           | Cardinality is per creator   |
| Creator Phone   | (0,*)       | dcterms:creator/foaf:phone          | Cardinality is per creator   |
| Creator Email   | (0,*)       | dcterms:creator/foaf:mbox           | Cardinality is per creator   |
| Creator Page    | (0,*)       | dcterms:creator/foaf:page           | Cardinality is per creator   |
| Contact         |             | scoro:contact_person                | Contain information about the designated point of contact for the Data Item                    |
| Contact Name    | (0,1)       | scoro:contact_person/foaf:name      | Cardinality is per contact   |
| Contact Phone   | (0,*)       | scoro:contact_person/foaf:phone     | Cardinality is per contact   |
| Contact Email   | (0,*)       | scoro:contact_person/foaf:mbox      | Cardinality is per contact   |
| Create Date     | (1,1)       | dcterms:created                     | Date on which the Data Item was first created  |
| Modified Date   | (1,1)       | dcterms:modified                    | Date on which the Data Item's information is updated   |
| Deposit Date    | (1,1)       |                                     | Date on which the Data Item is deposited   |
| Depositor Id    | (1,1)       |                                     | Identifier of the user who deposited the Data Item   |

| Relationship name | Cardinality | Targets      | ORE-ReM representation                 | Usage   |
|-------------------|-------------|--------------|--|---|
| hasMember         | (0,*)       | Data File    | ore:aggregates                         | Represents the relationship between a Data Item and its children Data Files   |
| isMemberOf        | (1,1)       | Collection   | ore:isAggregatedBy<br>dcterms:isPartOf | Represents the relationship between a Data Item and its containing Collection |
| hasMetadata       | (0,*)       | MetadataFile |  | Represents the relationship between a Data Item and its MetadataFile          |

## 5.4. Data File model

### Usage

Data File, an encapsulation of a bytestream, is the most granular unit of data. Data File has to be contained by a Data Item when being deposited into the system. Data File can only be a member of one Data Item.

### Model

| Property      | Cardinality | ORE-ReM representation               | Usage  |
|---------------|-------------|--------------------------------------|--|
| Id            | (1,1)       | dcterms:identifier<br>ore:similarTo  | Generated by the system during ingest (via package ingest) or creation (via the DCS Front End) |
| Name          | (0,1)       | opmv:hasFileName                     | File system name of the file   |
| Title         | (0,1)       | dcterms:title                        | A description label for the File   |
| Description   | (0,1)       | dcterms:description                  | A summary description of the File's content  |
| Format        | (0,*)       | dcterms:format<br>dcterms:conformsTo | Information regarding the format of the File, such as mimetypes, xml schemas, etc.             |
| Size          | (0,1)       | opmv:hasSize<br>dcterms:extent       | Size of the bytestream contain in the File, system generated property                          |
| Fixity        | (0,1)       |                                      | Checksum value of the File's bytestream  |
| Create Date   | (1,1)       | dcterms:created                      | Date on which the File was first created   |
| Modified Date | (1,1)       | dcterms:modified                     | Date on which the File's information is updated  |
| Deposit Date  | (1,1)       |                                      | Date on which the File is deposited  |
| Depositor Id  | (1,1)       |                                      | Identifier of the user who deposited the File  |

| Relationship name | Cardinality | Targets   | ORE-ReM representation                 | Usage   |
|-------------------|-------------|-----------|--|---|
| isMemberOf        | (1,1)       | Data Item | ore:isAggregatedBy<br>dcterms:isPartOf | Represents the relationship between a Data File and its containing Data Items |

## 5.5. Metadata File model

### Usage

Metadata File, an encapsulation of a bytestream, are used to further describe another object (including another Metadata File). Metadata File can only describe ONE other object and can only be deposited as part of the higher level object it (Collection, DataItem) described. Currently a Metadata File cannot describe a Project, but we expect to support this relationship in future releases.

### Model

| Property      | Cardinality | ORE-ReM representation               | Usage  |
|---------------|-------------|--------------------------------------|--|
| Id            | (1,1)       | dcterms:identifier<br>ore:similarTo  | Generated by the system during ingest (via package ingest) or creation (via the DCS Front End) |
| Name          | (0,1)       | opmv:hasFileName                     | File system name of the file   |
| Title         | (0,1)       | dcterms:title                        | A description label for the File   |
| Description   | (0,1)       | dcterms:description                  | A summary description of the File's content  |
| Format        | (0,*)       | dcterms:format<br>dcterms:conformsTo | Information regarding the format of the File, such as mimetypes, xml schemas, etc.             |
| Size          | (0,1)       | opmv:hasSize<br>dcterms:extent       | Size of the bytestream contain in the File, system generated property                          |
| Fixity        | (0,1)       |                                      | Checksum value of the File's bytestream  |
| Create Date   | (1,1)       | dcterms:created                      | Date on which the File was first created   |
| Modified Date | (1,1)       | dcterms:modified                     | Date on which the File's information is updated  |
| Deposit Date  | (1,1)       |                                      | Date on which the File is deposited  |
| Depositor Id  | (1,1)       |                                      | Identifier of the user who deposited the File  |

| Relationship name | Cardinality | Targets                 | ORE-ReM representation        | Usage  |
|-------------------|-------------|-------------------------|-------------------------------|--|
| isMetadataFor     | (1,1)       | Collection or Data Item | fedora-rels-ext:isMetadataFor | Represents the relationship between a Data File and its Metadata Files |