

Describing information

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Metadata (NISO)

«Metadata is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource. Metadata is often called data about data or information about information»
([*Understanding Metadata*](#), 2004)

Different use of the term “metadata”

- Database Management Systems (schemas of relational databases): machine understandable information
- World Wide Web (since the mid-1990's): records that describe electronic resources
- Tim Berners-Lee: machine understandable information describing web resources and other objects
- Library environment: any formal scheme of resource description, applying to any type of object, digital or non-digital
 - therefore, traditional library cataloging is a form of metadata; MARC 21 and the rule sets used with it, such as AACR2, are metadata standards
 - other metadata schemes have been developed to describe various types of textual and non-textual objects including published books, electronic documents, archival finding aids, art objects, educational and training materials, scientific datasets etc.

The hybrid library (Rusbridge)

- the Hybrid Library is on the continuum between the conventional and digital library, where electronic and paper-based information sources are used alongside each other
- the challenge associated with the management of the hybrid library is to encourage end-user resource discovery and information use, in a variety of formats and from a number of local and remote sources, in a seamlessly integrated way
- it should be "designed to bring a range of technologies from different sources together in the context of a working library, and also to begin to explore integrated systems and services in both the electronic and print environments" [C. Rusbridge, *Towards the hybrid library*, "D-Lib Magazine", July/August 1998, <http://www.dlib.org/dlib/july98/rusbridge/07rusbridge.html>]
- it should not be seen as a transitional phase between the conventional library and digital library but, rather, as a model in its own right, which can be usefully developed and improved

The digital library (DLF)

«Digital Libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities» ([*A working definition of digital library*](#), 1998)

Typology of metadata formats

	Band One	Band Two	Band Three
Record characteristics	Simple formats Proprietary Full text indexing	Structured formats Emerging standards Field structure	Rich formats International standards Elaborate tagging
Record formats	Lycos Altavista Yahoo etc	Dublin Core IAFA templates RFC 1807 SOIF LDIF	ICPSR CIMI EAD TEI MARC

[L. Dempsey – R. Heery, *Specification for resource description methods. Part 1. A review of metadata: a survey of current resource description formats*, DESIRE: Project Deliverable, 19 March 1997, p. 8, <http://www.ukoln.ac.uk/metadata/desire/overview/overview.pdf>]

Typology of metadata formats (adapted)

Band One	Band Two	Band Three	
<i>(full text indexes)</i>	<i>(simple structured generic formats)</i>	<i>(more complex structure, domain specific)</i>	<i>(part of a larger semantic framework)</i>
Proprietary formats <ul style="list-style-type: none"> • relatively unstructured • typically extracted automatically from resources by Web search services • no widely used standard format 	Proprietary formats Dublin Core ROADS templates <ul style="list-style-type: none"> • some structure simple enough to be created by non-specialist users • no elaborate internal structures • do not easily represent hierarchical objects or complex relationships between objects 	MARC TEI headers EAD CIMI	<ul style="list-style-type: none"> • more descriptive information, both for resource discovery and for the larger task of documenting objects or collections of objects • more structure than those in Band Two

[M. Day, *The metadata challenge for libraries: a view from Europe*, Preprints of the Metadiversity Conference Proceedings, National Federation of Abstracting & Information Services, 1999, http://www.nfais.org/publications/metadiversity_preprints22.htm]

What are metadata for?

In relation to the *context*:

- to document the production, maintenance, distribution, archiving of the resource
- to provide its cultural, technical, administrative, structural background
- to preserve its integrity through medium and long term archiving
- to manage dates, agents, structures etc.
- to enable profiling, data mining etc.

In relation to the *resource*:

- to **find** entities that correspond to the user's stated search criteria (i.e., to locate either a single entity or a set of entities in a file or database as the result of a search using an attribute or relationship of the entity)
- to **identify** an entity (i.e., to confirm that the entity described corresponds to the entity sought, or to distinguish between two or more entities with similar characteristics)
- to **select** an entity that is appropriate to the user's needs (i.e., to choose an entity that meets the user's requirements with respect to content, physical format, etc., or to reject an entity as being inappropriate to the user's needs)
- to acquire or **obtain** access to the entity described (i.e., to acquire an entity through purchase, loan, etc., or to access an entity electronically through an online connection to a remote computer)

- *HyperText Markup Language Specification Version 2.0*
[http://www.w3.org/MarkUp/html-spec/html-spec_toc.html]
Meta-information has two main functions:
 - to provide a means to discover that the data set exists and how it might be obtained or accessed; and
 - to document the content, quality, and features of a data set, indicating its fitness for use
- M. Dillon, *Metadata for Web Resources: How Metadata Works on the Web* [http://www.loc.gov/catdir/bibcontrol/dillon_paper.html]
The first of these bullets targets resource discovery; the second targets resource description

A misunderstanding?

- “Then there is the question of cataloguing and metadata. My view of the latter is that it is an ill-considered attempt to find some kind of Third Way between the wilderness of search engines and free text searching and the grand architecture of bibliographic control that librarians have developed over the last 150 years. I think that metadata is the product of those with no knowledge of, or regard for, cataloguing — they are bibliographic alchemists seeking the philosopher’s stone that will offer us effective cataloguing without expense and effective access without controlled vocabularies. There is no such thing and the sooner that notion is disposed of the better” [M. Gorman, *Electronic resources: which are worth preserving and what is their role in library collections?* International conference “Electronic resources: definition, selection and cataloguing” (Rome, 26-28 november 2001)
[\[http://w3.uniroma1.it/ssab/er/relazioni/gorman_eng.pdf\]](http://w3.uniroma1.it/ssab/er/relazioni/gorman_eng.pdf)

Not simply a cataloguing record

- an important reason for creating descriptive metadata is to facilitate discovery of relevant information, as it serves the same functions in resource discovery as good cataloging does by:
 - allowing resources to be found by relevant criteria
 - identifying resources
 - bringing similar resources together
 - distinguishing dissimilar resources
 - giving location information
- in addition to resource discovery, metadata can
 - help organize electronic resources
 - facilitate interoperability and legacy resource integration
 - provide digital identification
 - support archiving and preservation

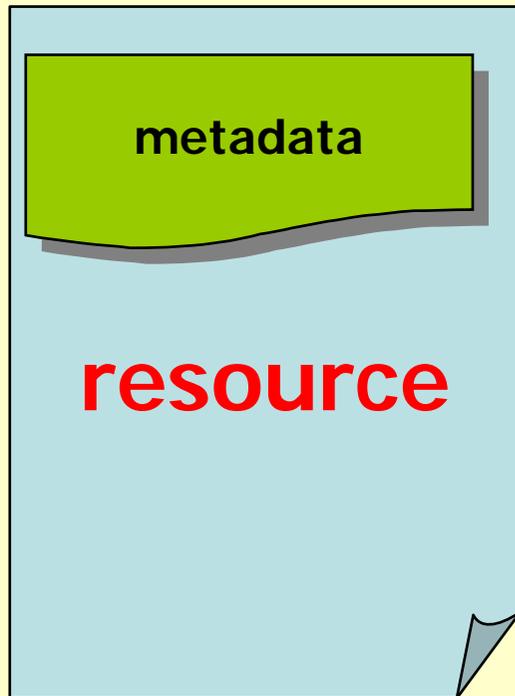
Organizing electronic resources

- given the explosion of Web-based resources, aggregate sites or portals are increasingly useful in organizing links to resources based on audience or topic (VRDs, pathfinders, etc.)
- rather than creating static webpages, with the names and locations of the resources “hardcoded” in the HTML, it is more efficient to generate these pages dynamically from metadata stored in databases
- various software tools can be used to automatically extract and reformat the information for Web applications ([Grokker](#))

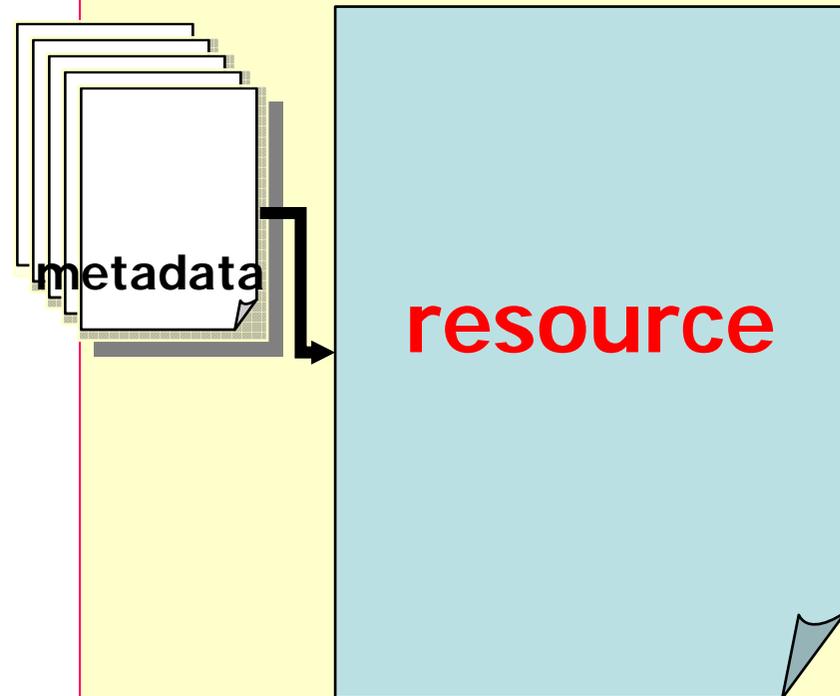
Storing metadata

- metadata can be embedded in a digital object or it can be stored separately. Metadata is often embedded in HTML documents and in the headers of image files
- storing metadata with the object it describes ensures the metadata will not be lost, obviates problems of linking between data and metadata, and helps ensure that the metadata and object will be updated together
- however, it is impossible to embed metadata in some types of objects (for example, artifacts). Also, storing metadata separately can simplify the management of the metadata itself and facilitate search and retrieval. Therefore, metadata is commonly stored in a database system and linked to the objects described

embedded metadata



stand-alone metadata



Types of metadata

- *Descriptive metadata* describe a resource for purposes such as discovery and identification. It can include elements such as title, abstract, author, and keywords
- *Structural metadata* indicate how compound objects are put together, for example, how pages are ordered to form chapters
- *Administrative metadata* provide information to help manage a resource, such as when and how it was created, file type and other technical information, and who can access it. Two subsets of administrative data are:
 - *Rights management metadata*, which deal with intellectual property rights
 - *Preservation metadata*, which contain information needed to archive and preserve a resource

- *Guidance on the Structure, Content, and Application of Metadata Records for Digital Resources and Collections*. Report of the IFLA Cataloguing Section Working Group on the Use of Metadata Schemas [<http://www.ifla.org/VII/s13/guide/metaguide03.pdf>]
- established at the IFLA 1998 Conference in Amsterdam, the Working Group agreed to focus on the following three objectives:
 - Objective 1: to create an inventory of the development and implementation/application of metadata schemas in different countries
 - Objective 2: to provide guidance (and ultimately, as appropriate, guidelines) to libraries as to when and/or how best to use metadata records and bibliographic records (catalogue records)
 - Objective 3: to determine a metadata “core record” – i.e., a set of most commonly occurring elements in selected metadata schemas – that could be used by authors and/or publishers of electronic records to enhance resource discovery, and to provide, where appropriate, elements for incorporation into bibliographic records (catalogue records)

Objective 2

- Concerning the second objective, the Working Group discussed the confusion that exists within the bibliographic community as to when and how best to use metadata records versus catalogue records
 - What, if any, is the relationship between the two?
- Depending on what is included, and the intended purpose(s) or use of the library's specified digital collection, a number of *types* or *structures* of metadata may be considered appropriate to the configuration of the final surrogate record. As a review of a number of large-scale metadata implementations confirm, these can be broadly categorized as follows:
 - Administrative metadata
 - Descriptive metadata
 - Analytical metadata
 - Rights management metadata
 - Technical metadata

Administrative metadata

- “housekeeping” information about the record itself – its creation, modification, relationship to other records, etc. Examples of elements pertaining to administrative metadata include, but are not restricted to, the following:
 - Record number
 - Date of record creation
 - Date of last modification
 - Identification of creator/reviser of record
 - Language of record
 - Notes
 - Relationship of this record to other(s)

Descriptive metadata

- information describing the physical and intellectual properties or content of a digital item or object with such elements as:
 - Title (also alternative and parallel titles; subtitles; short titles; etc.)
 - Creator (author; composer; cartographer; artist; etc.)
 - Date
 - Publisher
 - Unique identifiers (ISBN; ISSN; etc.)
 - Dynamic links (URI; URL; etc.)
 - Summary; descriptive note; review; etc.
 - Audience level
 - Physical media; format; etc.
 - Language of the item or object
 - Version

- information analysing and enhancing access to the resource's contents. Sometimes referred to as “subject metadata”, elements may include:
 - Controlled subject terms, e.g., subject headings, descriptors
 - Subject/topic keywords
 - Abstract; Table of Contents (TOC)
 - Codes derived from classification systems or categorization schemes
 - Other elements of local importance, e.g., department affiliation; links to other related e-content

- information regarding restrictions (legal; financial; etc.) on access to, or use of, digital items or objects. Such elements as the following may apply:
 - Restrictions on use
 - Permission statements
 - Subscriber/licensing/pay-per-use fees
 - Acknowledgements
 - Copyright notice
 - Retention schedules
 - Quality ratings
 - Use disclaimers

- particular hardware or software used in converting an item/object to a digital format, or in storing, displaying, etc., may require the use of such elements as:
 - Digitizing equipment specifications
 - Camera positions
 - Shooting conditions
 - Coding parameters
 - Voice recognition and/or read-back hardware and software
 - Optical scanner specifications
 - Image rendering equipment
 - Type of file and conversion software requirements

Selecting a Metadata Schema

- the choice of a metadata schema or schemas to be used in creating the surrogate records for uniquely identifying and linking to digital items or objects in a collection will depend
 - on where and how the resources will be accessed and used
 - on the desired degree of *granularity*, or the amount of detail to be captured and represented in the metadata record
- an individual, organization, or network of libraries may determine
 - to use one or more *standardized* metadata schemas
 - that a local or “home grown” solution – a set of locally-determined and supported metadata elements – is the preferred option
 - to combine elements of an established standard with elements appropriate to the local situation of resources and objectives

Choosing between metadata and bibliographic records (1/3)

- only metadata
 - a collection of electronic resources (either born digital or digitized) not previously accessible to end-users to be added to a library's Intranet, Internet, portal, or knowledge repository
 - metadata records describing and providing dynamic links to those digital images are created using an appropriate existing or a locally devised metadata schema

Choosing between metadata and bibliographic records (2/3)

- instead of/in the place of “traditional” bibliographic records
 - “traditional” cataloguing standards for physical collections of print and/or audio-visual items, and “emerging” metadata standards for electronic/digital resources accessible via the Web
 - standardize on one metadata schema to facilitate end-user understanding of, and access to, materials regardless of their type of physical format.
 - the development of XML has provided a common syntax for facilitating “interoperability” among metadata schemas. As individual elements within each schema are mapped to, and expressed in the language (or syntax) of, XML, exchange of data within the XML framework is greatly facilitated and transparent to the end-users

Choosing between metadata and bibliographic records (3/3)

- in addition to “traditional” bibliographic records
 - with the growth in cooperative or collaborative projects, the number of tools that will automatically convert a record from one metadata schema format to another (e.g., expressing a MARC record within the Dublin Core metadata set) has been growing, making it possible for legacy records to co-exist with emerging metadata standards
 - a metadata-enabled record describing an electronic resource to which it is linked can be captured and converted into a MARC format for inclusion in a library’s online public access catalogue (OPAC); at the same time, metadata expressed in one environment can be harvested (i.e. by Web-based search engines or Web crawlers) and re-used in another, as appropriate or required
 - such an approach may be especially beneficial to linking across different subject domains, disciplines, fields, or applications, including those associated with archives, museums, art galleries, education, publishing, etc.

- the WG agreed that it would be useful to create a logical core record based on the framework of the Functional Requirements for Bibliographic Records (FRBR), by establishing a set of metadata element types required to fulfill each of the four functions defined in that report:
 - Find (data correspond to search criteria)
 - Identify (confirm entity described in record corresponds to entity sought; distinguish between 2 entities with same title)
 - Select (language; version)
 - Obtain (place order, request; remote access)
- the actual metadata elements (i.e., entity names and values) would depend on which metadata schema is being used

The “core” metadata set

- “Regardless of which metadata schema is being used to encode or markup an electronic resource, which metadata elements within a schema should be included in a surrogate record describing this resource so as to facilitate the processes of finding, identifying, selecting, and/or obtaining the item or object? While the proposed core record *contains* metadata elements, it is not in any way assumed to be, or to represent, or to replace any other metadata schema *per se*. It should be considered, rather, as a model, or framework, or structure for metadata elements descriptive of any type or format of electronic resource in any intellectual discipline or knowledge domain.

- crosswalk [DCMI glossary]
 - a table that maps the relationships and equivalencies between two or more metadata schemes. Crosswalks or metadata mapping support the ability of search engines to search effectively across heterogeneous databases
- a crosswalk among the more widely used metadata schemas in the bibliographic control community was developed to facilitate the comparison process in order to
 - analyze how each element was represented (entity names and values)
 - define and/or refine the terminology of the assigned draft core record elements
 - identify gaps between and among the elements in the original crosswalk of metadata schemas
 - define functions carried out by elements that exist in one domain, but not in another

<i>SCHEMAS</i> ----- ELEMENTS	<i>MARC</i> <i>21</i>	<i>UNI</i> <i>MARC</i>	<i>DC</i>	<i>TEI</i>	<i>EAD</i>	<i>VRA</i>	<i>CSDGM/</i> <i>FGDC</i>	<i>CIMI</i>	<i>GILS</i>	<i>ONIX</i>
Subject	X	X	X	X	X	X	X	X	X	X
Date	X	X	X	X	X	X	X	X	X	X
Conditions of use	X	X	X		X		X	X		X
Publisher	X	X	X	X	X*		X	X	X	X
Name assigned to the resource	X	X	X	X	X	X	X	X	X	X
Language/ Mode of expression	X	X	X	X	X				X	X
Resource identifier	X	X	X	X		X	X	X	X	X
Resource type	X	X	X	X	X	X	X	X	X	X
Author/ Creator	X	X	X	X	X	X	X	X	X	X
Version	X	X	X	X			X			X

<i>FUNCTIONAL REQUIREMENTS</i> ----- ELEMENTS:	<i>IDENTIFY</i>	<i>SELECT</i>	<i>FIND</i>	<i>OBTAIN</i>
Subject	X	X	X	
Date	X	X		X
Conditions of use				X
Publisher	X	X		X
Name assigned to the resource	X	X	X	X
Language/mode of expression		X		
Resource identifier	X		X	X
Resource type	X	X		X
Author/creator	X	X	X	X
Version	X	X		X

Results of the logical and functional metadata mapping

- in addition to analyzing what elements were being used within each metadata schema, how they were represented and defined, and what function(s) they served, the “master crosswalk” also provided a ready visual summary of
 - elements that match across all schemas (i.e., is it an exact match or are there variations in tag names or meanings, e.g., date of origin *versus* creation?)
 - elements that correspond between two systems or among three or more
 - elements that are clearly unique to a domain and missing from all others
 - elements where some inherent ambiguity exists (i.e., the same entity name being used in different metadata schemas to represent different concepts or contexts (e.g., “organization” as institution or as process))

Dublin Core

- the Dublin Core Metadata Element Set arose from discussions at a 1995 workshop sponsored by OCLC and the National Center for Supercomputing Applications (NCSA), which was held in Dublin, Ohio; the element set was named after the location of this workshop
- the current development of the Dublin Core and related specifications is managed by the [Dublin Core Metadata Initiative](#) (DCMI)
- the development and maintenance of a core set of metadata terms (the [DCMI Metadata Terms](#)) continues to be one of the main activities of DCMI. In addition, DCMI is developing guidelines and procedures to help implementers define and describe their usage of Dublin Core metadata in the form of Application Profiles. This work is done in a [work structure](#) that provide discussion and cooperation platforms for specific communities (e.g. education, government information, corporate knowledge management) or specific interests (e.g. technical architecture, accessibility)

The goal of DCMI

- the original objective of the Dublin Core was to define a set of elements that could be used by authors to describe their own Web documents, as countermeasures to the proliferation of electronic resources and the inability of the librarians to cope with such explosion
- the goal was therefore to define a few elements and some simple rules that could be applied by noncatalogers
- originally the core elements were 13, but they were later increased to 15
- “an element is a property of a resource. As intended here, “properties” are attributes of resources -- characteristics of a resource, such as a Title, Publisher, or Subject. Elements are formally defined terms which are used to describe attributes and properties of a resource” [DCMI glossary]

The function of DC

Discover
resources

Manage
documents

Control IP
Rights

Identify
versions

Certify
authenticity

Indicate
status

Mark content
structure

Situate
geospatially

Describe
processes

Characteristics of the Dublin Core

- the elements must be simple to understand and use, so that any creator of networked resources would be able to describe their own work without requiring extensive training.
- every element is both optional and repeatable.
- the elements should be international and cross-disciplinary in scope and applicability.
- the element set should be extensible, to allow discipline or task-specific enhancements.
- the most important strategic application of the element set would be for embedded descriptions of Web resources, created by the resource authors, which meant a syntax that could be accommodated within HTML 's <META> tag

DC data model work-in-progress

- Provides explicit definitions of resources
- Relates DC principles and practices to the developments outside DCMI
- Makes clear the relationship of DC “packages” of information to other metadata “packages”
- Paves the way for future progress for DCMI

DC element set

- Title
- Creator
- Subject
- Description
- Publisher
- Contributor
- Date
- Type
- Format
- Identifier
- Source
- Language
- Relation
- Coverage
- Rights

- Each term is specified with the following minimal set of attributes:
 - **Name:** The unique token assigned to the term.
 - **URI:** The Uniform Resource Identifier used to uniquely identify a term
 - **Label:** The human-readable label assigned to the term
 - **Definition:** A statement that represents the concept and essential nature of the term
 - **Type of Term:** The type of term, such as Element or Encoding Scheme, as described in the DCMI Grammatical Principles
 - **Status:** Status assigned to term by the DCMI Usage Board, as described in the DCMI Usage Board Process
 - **Date issued:** Date on which a term was first declared

Term Name: title

- URI: <http://purl.org/dc/elements/1.1/title>
- Label: Title
- Definition: A name given to the resource
- Comment: Typically, a Title will be a name by which the resource is formally known
- Type of Term: [element](#)
- Status: [recommended](#)
- Date Issued: 1999-07-02

Further term attributes

- where applicable, the following attributes provide additional information about a term:
 - **Comment:** Additional information about the term or its application
 - **See:** A link to authoritative documentation
 - **References:** A citation or URL of a resource referenced in the Definition or Comment
 - **Refines:** A reference to a term refined by an Element Refinement
 - **Qualifies:** A reference to a term qualified by an Encoding Scheme
 - **Broader Than:** A reference from a more general to a more specific Vocabulary Term
 - **Narrower Than:** A reference from a more specific to a more general Vocabulary Term

Term Name: alternative

- URI: <http://purl.org/dc/terms/alternative>
- Label: Alternative
- Definition: Any form of the title used as a substitute or alternative to the formal title of the resource
- Comment: This qualifier can include Title abbreviations as well as translations
- Type of Term: [element-refinement](#)
- Refines: <http://purl.org/dc/elements/1.1/title>
- Status: [recommended](#)
- Date Issued: 2000-07-11

- New Elements (Audience, etc.)
- Element Refinements
 - Make element meanings narrower, more specific:
 - a *DateCreated* versus *DateModified*
 - an *IsReplacedBy* versus *Replaces* Relation
 - Depending on syntax chosen, refinements may appear as stand-alone tags instead of with elements:
 - **<dct:created>2002-10-04</dct:created>**, instead of:
 - **<dc:date><dct:created>2002-10-04 </dct:created></dc:date>**
- Value Encoding Schemes
 - Indicate that the value is:
 - a term from a controlled vocabulary (e.g., Library of Congress Subject Headings)
 - a string formatted in a standard way (e.g., that "05/02" means May 2nd, not February 5th)

Qualified DC (1/3)

DC element	Refinement	Reference schema
Title	Alternative	-
Creator	-	-
Subject	-	LCSH MeSH DDC LCC UDC
Description	Table Of Contents Abstract	-
Publisher	-	-
Contributor	-	-
Date	Created Valid Available Issued Modified Date Copyrighted Date Submitted	DCMI Period W3C-DTF
Type	-	DCMI Type Vocabulary

Qualified DC (2/3)

Format	-	IMT
	Extent	-
	Medium	-
Identifier	-	URI
	Bibliographic Citation	-
Source	-	URI
Language	-	ISO 639-2 RFC 3066
Relation	Is Version Of Has Version Is Replaced By Replaces Is Required By Requires Is Part Of Has Part Is Referenced By References Is Format Of Has Format Conforms To	URI

Qualified DC (3/3)

Coverage	Spatial	DCMI Point ISO 3166 DCMI Box TGN
	Temporal	DCMI Period W3C-DTF
Rights	Access Rights	-
Audience	Mediator Education Level	-

Link to a schema

offline

```
<META NAME="DC.creator" CONTENT="(TYPE=email)
johnsmith@expressmail.com">
<LINK REL=SCHEMA.dc
HREF="http://purl.org/metadata/dublin_core_elements#creator">
```

online

```
<META NAME="DC.language" CONTENT="(SCHEMA=iso639) en">
<LINK REL=SCHEMA.iso639 REFERENCE="ISO 639:1988 Code for
the representation of names of languages">
```

Dumb-down principle

- the qualification of Dublin Core elements is guided by a rule known colloquially as the Dumb-Down Principle
- according to this rule, a client should be able to ignore any qualifier and use the value as if it were unqualified
- while this may result in some loss of specificity, the remaining term value (minus the qualifier) must continue to be generally correct and useful for discovery
- qualification is therefore supposed only to refine, not extend the semantic scope of an element
- example
 - Title="IFLA Journal" and Title.Alternative="International Federation of Library Associations and Institutions Journal"would be treated as if they were expressed as:
 - Title="IFLA Journal" and Title="International Federation of Library Associations and Institutions Journal"

The One-to-One Principle

- Dublin Core metadata describe one manifestation or version of a resource, rather than assuming that manifestations stand in for one another
- a jpeg image of the Mona Lisa has much in common with the original painting, but it is not the same as the painting
- as such the digital image should be described as itself, most likely with the creator of the digital image included as a Creator or Contributor, rather than just the painter of the original Mona Lisa
- the relationship between the metadata for the original and the reproduction is part of the metadata description, and assists the user in determining whether he or she needs to go to the Louvre for the original, or whether his/her need can be met by a reproduction

Application profile

- in DCMI usage, an application profile is a declaration of the metadata terms an organization, information resource, application, or user community uses in its metadata
- in a broader sense, it includes the set of metadata elements, policies, and guidelines defined for a particular application or implementation
- the elements may be from one or more element sets, thus allowing a given application to meet its functional requirements by using metadata elements from several element sets including locally defined sets (for example, a given application might choose a specific subset of the DC elements that meets its needs, or may include elements from the DC, another element set, and several locally defined elements, all combined in a single schema)
- an application profile is not considered complete without documentation that defines the policies and best practices appropriate to the application

What problems do Applications Profiles solve?

- implementors adapt standards to context:
 - DC is felt as too small, more terms are needed
 - some of the terms must be more specific
- a profile describes how an application:
 - uses generic terms (e.g. Dublin Core)
 - uses more specialized terms
 - to describe “photographs”, “products”, “collections”...
 - constrains the use of properties
 - example: “When using dc:language, values must conform to **RFC 3066!**”

- DCAP does not define new terms – it merely cites terms defined elsewhere (e.g., in Dublin Core)
- DCAP is a set of Property Usages
- a Property Usage describes how a (previously declared) Property is used in the metadata of an application
- all DCMI Elements and Element Refinements are Properties

A Property Usage

- references (“uses”) exactly one property defined elsewhere
- may provide additional documentation on how property is interpreted
- may give it an application-specific label
- may specify obligation (e.g., mandatory, optional, conditional)
- may specify constraints on permitted values (e.g., “encoding schemes”)

Name of Term	subject
Term URI	http://purl.org/dc/elements/1.1/subject
Label	Subject
Defined By	http://dublincore.org/documents/dcmi-terms/
Source Definition	The topic of the content of the resource.
DC-Lib Definition	
Source Comments	Typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.
DC-Lib Comments	<p>If a geographic or temporal aspect is recorded use the element Coverage. It may also be repeated in Subject if desired. If there is a subject string with elements in addition to a geographic, include the entire string in Subject with geographic element also in Coverage.</p> <p>It is highly recommended that either freetext or controlled vocabulary be supplied as element Subject in the metadata where appropriate and feasible. It is also recommended that a controlled vocabulary be used with encoding scheme specified. If no encoding scheme is specified, it is treated as keyword.</p> <p>If using qualified DC, always use the encoding scheme(s) for terms from a controlled vocabulary.</p>
Type of term	element
Refines	
Refined By	
Has Encoding Scheme	<p>Library of Congress Subject Headings - http://purl.org/dc/terms/LCSH</p> <p>Medical Subject Headings - http://purl.org/dc/terms/MESH</p> <p>Dewey Decimal Classification - http://purl.org/dc/terms/DDC</p> <p>Library of Congress Classification - http://purl.org/dc/terms/LCC</p> <p>Universal Dewey Classification - http://purl.org/dc/terms/UDC</p> <p>These are encoding schemes currently defined by DCM1. As additional schemes are registered, they will be included.</p> <p>Additional encoding schemes will be registered for those used in the library domain based on the MARC list of subject and classification schemes. Including an identifier to link to a registry where all encoding schemes are defined (e.g. based on RSLP schema) needs to be explored.</p>
Obligation	MA
Occurrence	

Interoperability

- describing a resource with metadata allows it to be understood by both humans and machines in ways that promote interoperability
- interoperability is the ability of multiple systems with different hardware and software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using defined metadata schemes, shared transfer protocols, and crosswalks between schemes, resources across the network can be searched more seamlessly

- [Interoperability](#) can be regarded as the ongoing process of ensuring that the systems, procedures and culture of an organisation are managed in such a way as to maximise opportunities for exchange and reuse of information. It covers many areas including:
 - Technical Interoperability - One important consideration here is the development of communication, transport, storage and representation standards.
 - Semantic Interoperability - The use of different terms to describe similar concepts can cause problems in communication, program execution and data transfer.
 - Political/ Human Interoperability - The decision to make resources more widely available also has implications for organisations, their staff and end users.
 - Inter-community Interoperability - There is an increasing need to require access to information from a wide range of sources and communities.
 - International Interoperability - When working with other countries there are variations in standards, communication problems, language barriers, differences in communication styles and a lack of common ground

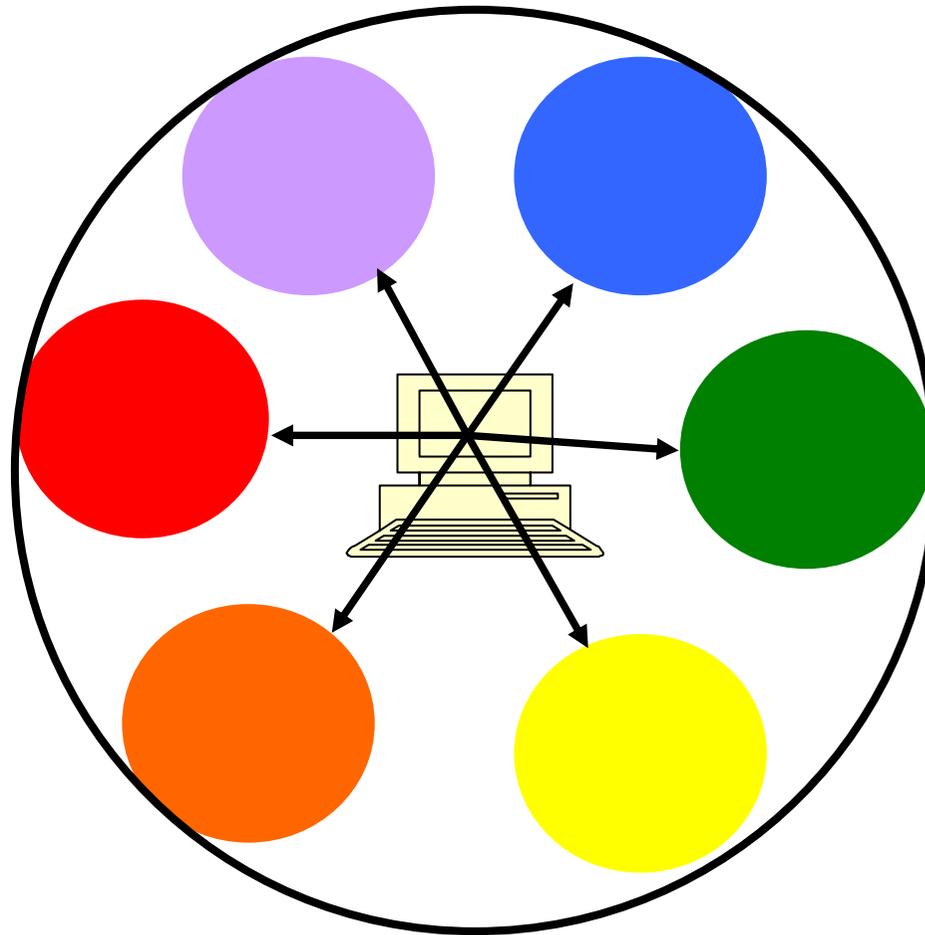
Technical Interoperability

- the most straightforward aspect of maintaining interoperability
- technical issues include ensuring an involvement in the ongoing development of communication, transport, storage and representation standards such as Z39.50, ISO-ILL, XML, etc.
- work is required both to ensure that these individual standards move forward to the benefit of the community, and to facilitate where possible their convergence, such that systems may effectively make use of more than one standards-based approach

Approaches to technical interoperability: Z39.50 protocol

- cross-system search: implies the use of the Z39.50 protocol
- Z39.50 implementers do not share metadata but map their own search capabilities to a common set of search attributes

Z39.50 search model



Z39.50 search attributes

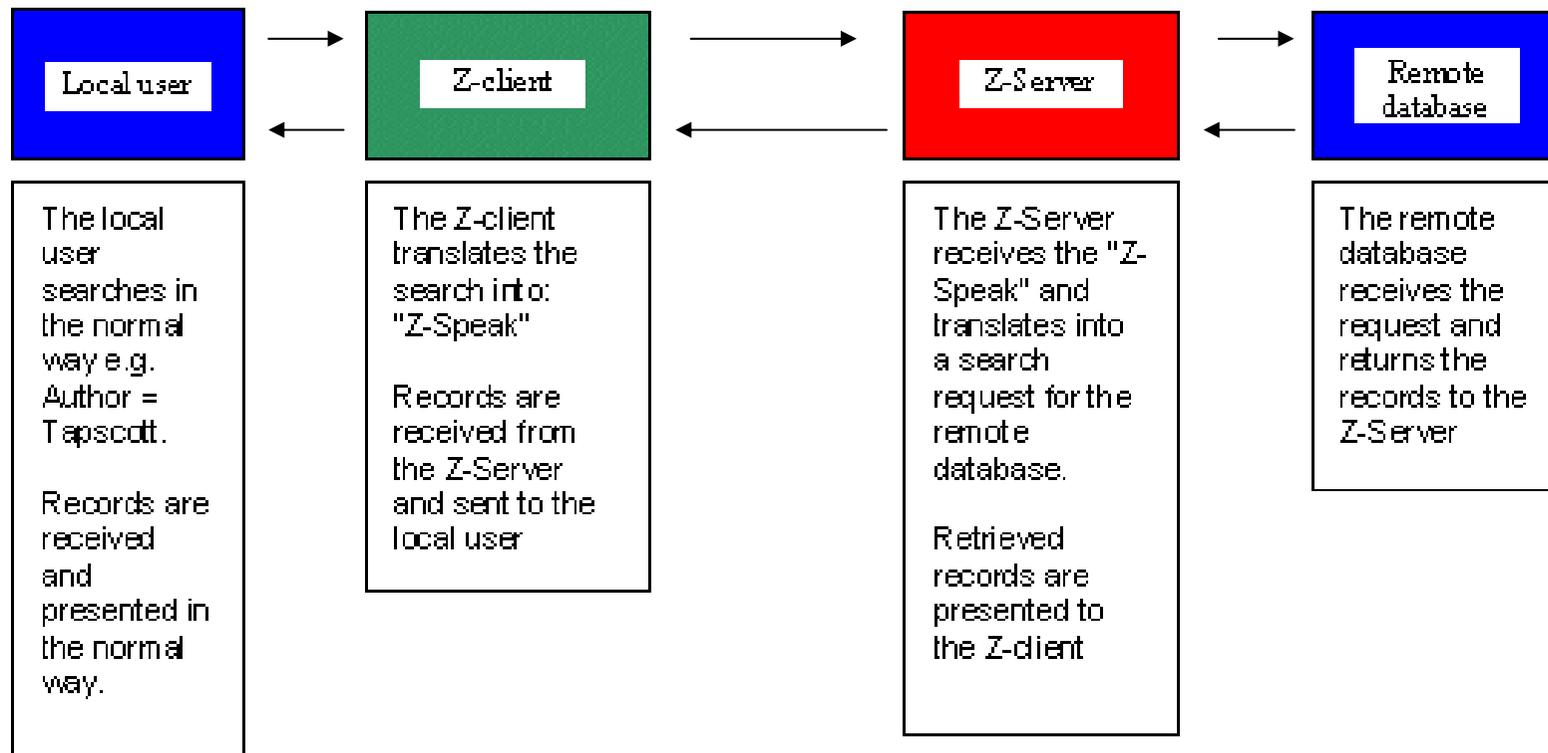
Attribute type	Attribute values	Attribute name
Use (1)	4, 21, 31, 1003, 1007, 1016	title, subject heading, date of publication, author, identifier-standard, any
Relation (2)	1, 2, 3, 4, 5	less than, less than or equal, equal, greater than or equal, greater than
Position (3)	1, 3	first in field, any position in field
Structure (4)	1, 2, 101	phrase, word, normalized
Truncation (5)	1, 100	right truncation, do not truncate
Completeness (6)	1, 3	incomplete subfield, complete field

Bib-1 profile

Attribute type	Attribute values	Attribute name
Use (1)	4	title
Relation (2)	3	equal
<i>Position (3)</i>	<i>3</i>	<i>any position in field</i>
<i>Structure (4)</i>	<i>2</i>	<i>word</i>
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

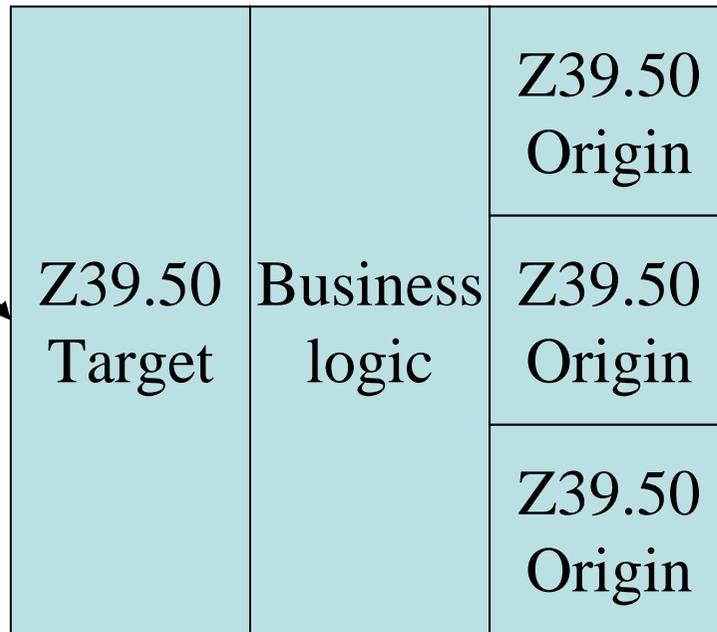
Title keyword search

Z-client – Z-server interactions

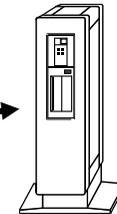


Multi-target Z39.50 gateway

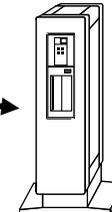
Z39.50 client



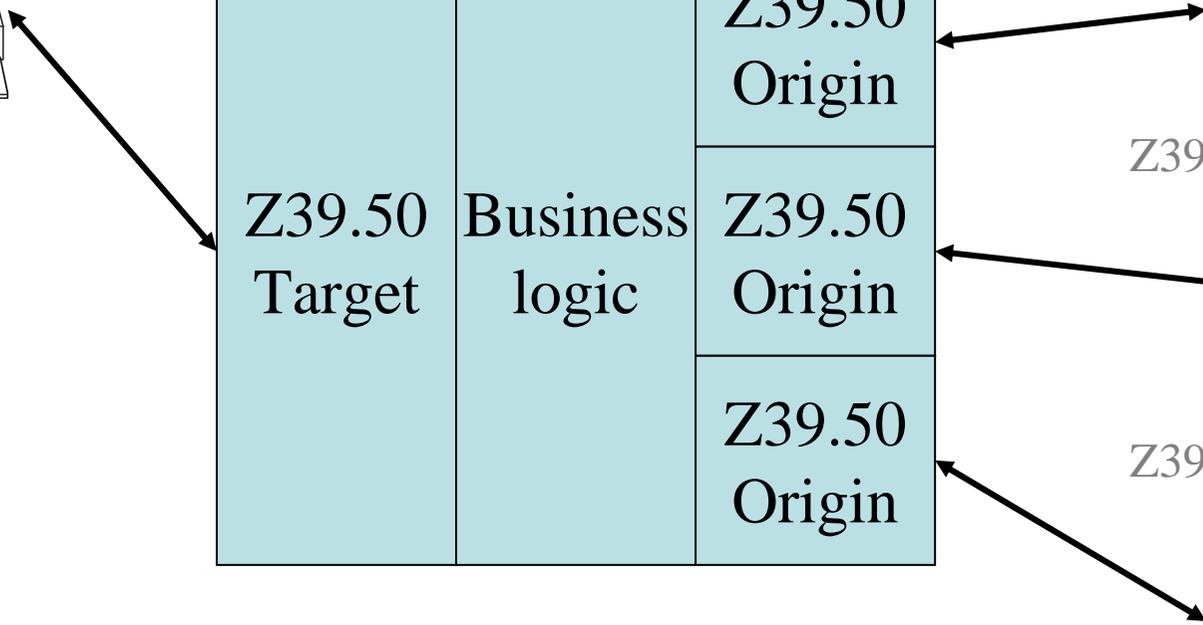
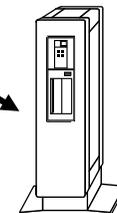
Z39.50 server



Z39.50 server



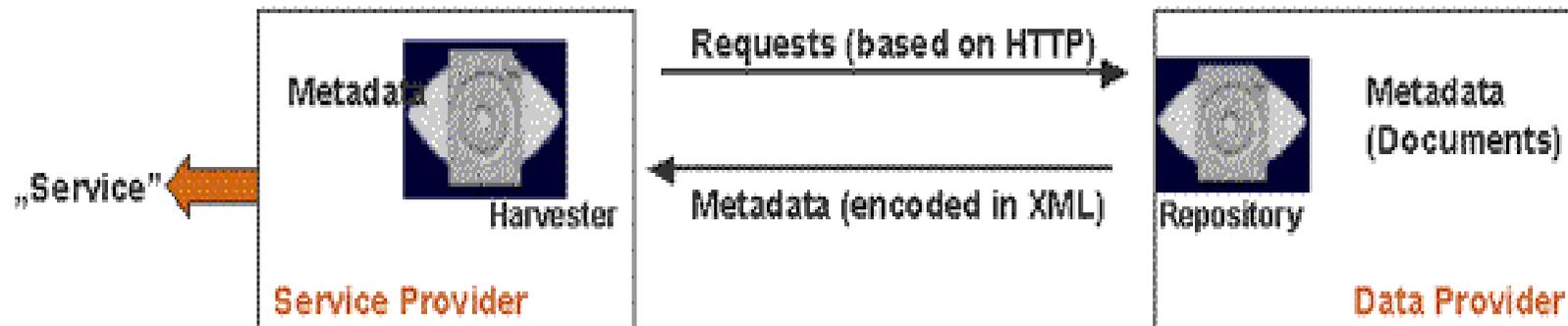
Z39.50 server



Approaches to technical interoperability: metadata harvesting

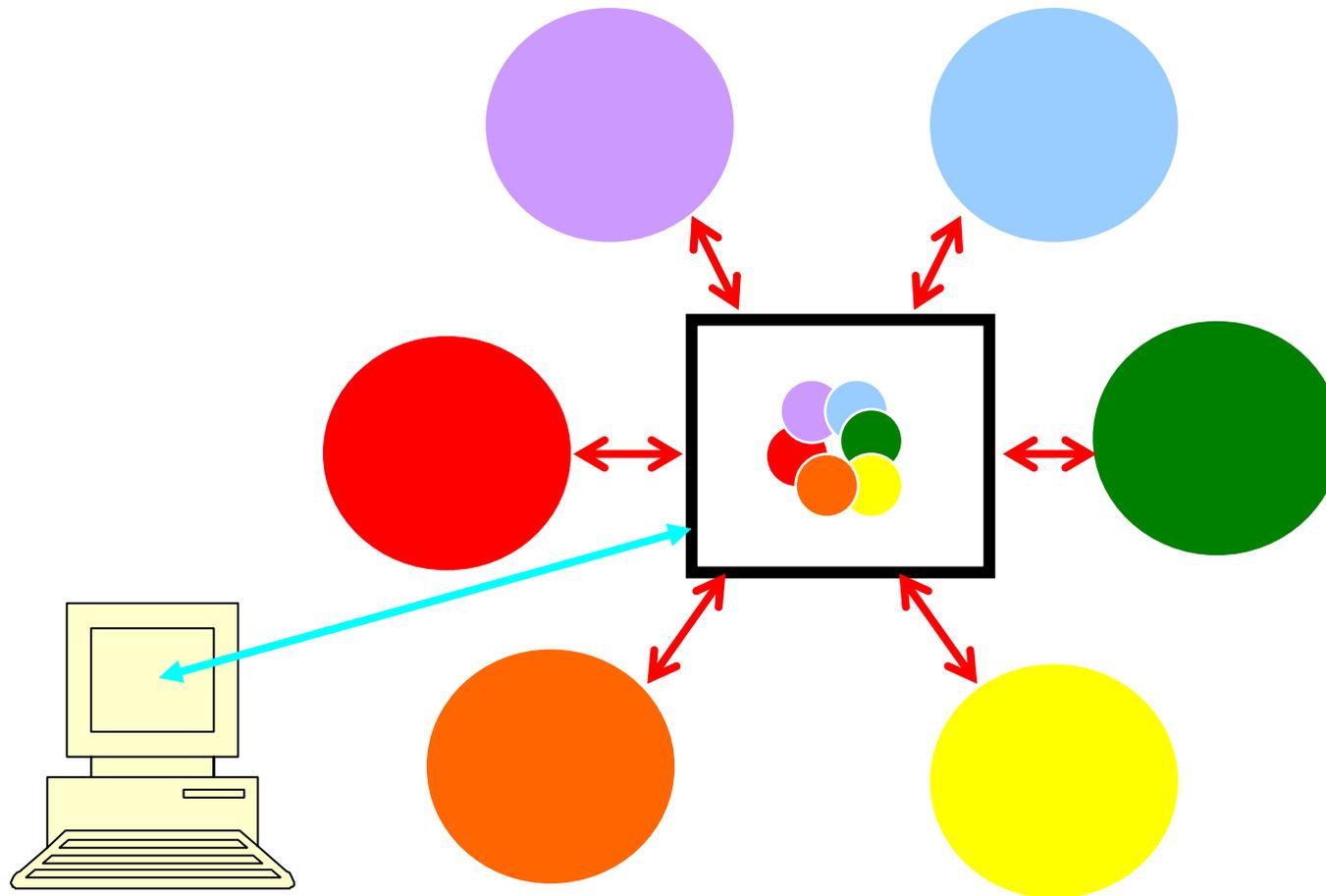
- a contrasting approach taken by the Open Archives Initiative is for all data providers to translate their native metadata to a common core set of elements and expose this for harvesting (OAI-PMH protocol)
- search service provider then gathers the metadata into a consistent central index (aggregator) to allow cross-repository searching regardless of the metadata formats used by participating repositories

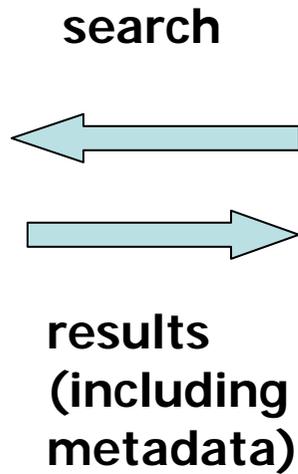
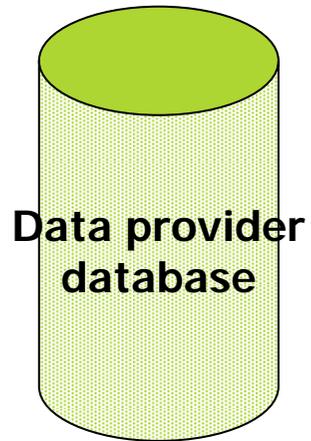
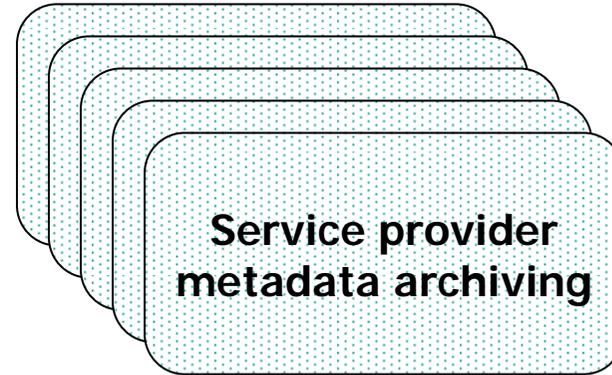
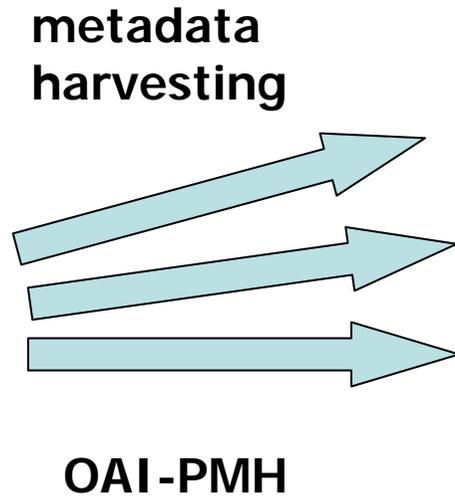
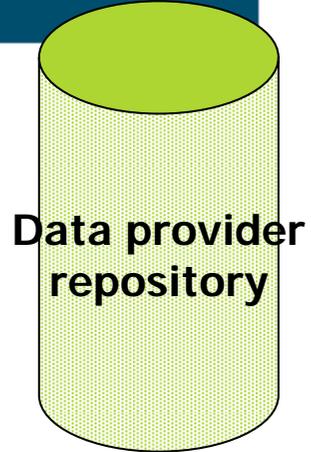
OAI-PMH



L. Carpenter, *OA-Forum Tutorial*, University of Bath, 2003.

OAI search model





Resource with no descriptive metadata

Provider/
 distributor



end user

Resource with descriptive metadata

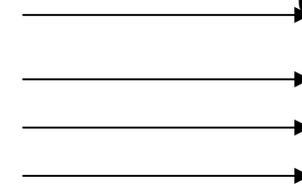
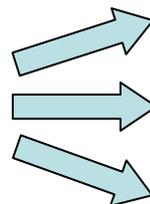
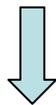
multiple access points

Provider /
 distributor



user
 communities

Metadata
 aggregators



Semantic Interoperability

- a host of issues, all of which become more pronounced as individual resources — each internally constructed in their own semantically consistent fashion — are made available through 'gateways' such as [Intute: Social Sciences](#) or union catalogues like [COPAC](#) (catalogues of all the UK National Libraries, a wide range of major University libraries, plus Trinity College Dublin Library in Ireland, as well as specialist collections such as the National Art Library-V&A Museum)
- almost inevitably, resources use different terms to describe similar concepts ('Author', 'Creator', and 'Composer', for example), or even use identical terms to mean very different things, introducing confusion and error into their use
- ongoing work on the development and distributed use of thesauri such as those from the [Getty](#) is one important aid in this area ([FACET](#), a web interface prototype dynamically generated – a “data driven query builder” –with the aim of exploring how a thesaurus can be integrated into a search interface and the potential of semantic expansion in querying collections indexed with controlled metadata)

Authority control

- authority control is an important aspect of terminology services. Its main function is to identify and use correctly named entities
 - improving precision and recall in retrieval by joining different name variants of an identical entity
 - disambiguating identical name forms that refer to different entities
- the issue is intensified due to the frequency and importance of the occurrence of names, causing extensive problems in a single database or repository
- they multiply, however, when using different sources for searching or when building aggregator services
- areas of application include support for indexing, linking, searching, browsing, disambiguation, metadata enhancement and terminology creation (Project Perseus in 2006 found that about 6-7% of all words in texts are named entities, i.e. person and organisational names, places, times and dates)

Why standardize?

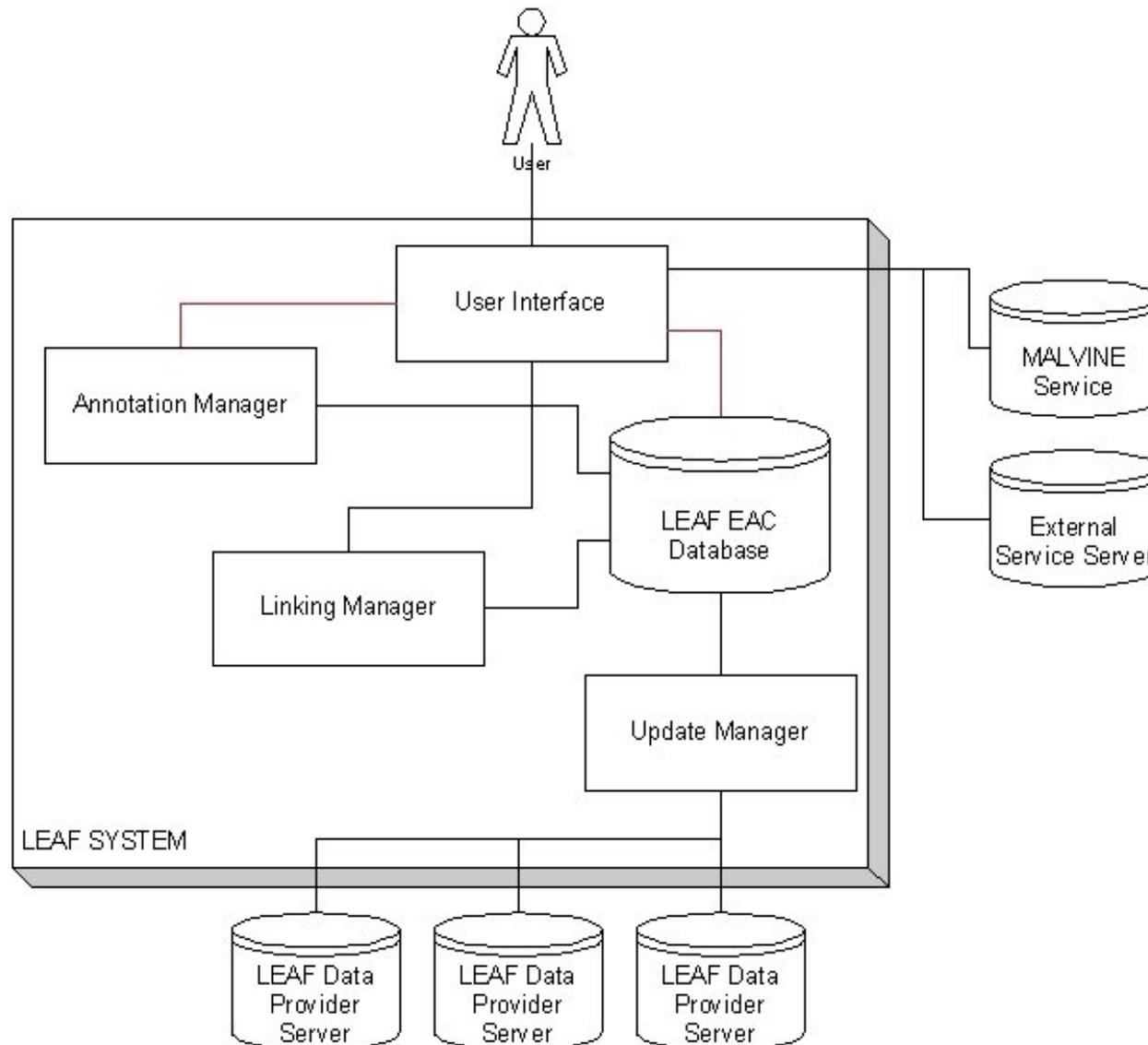
- semantic interoperability efforts have aimed to foster consistency by standardising with the help of, primarily, name authority databases and gazetteers or other geographic name authorities. Text and data mining techniques can be instrumental as a support for such authority files and their creation and maintenance or even as an alternative in some of the application areas
- the results of such efforts are needed to
 - support keyword assignment and named entity indexing
 - allow and improve automatic indexing of content
 - support advanced searching and browsing
 - allow metadata validation and enhancement operations
 - allow cross-searching/browsing and linking between several information sources
 - identify potential candidate terms for the creation of a suitable and topical domain terminology and to contribute to the building of domain-specific authority files

- libraries, especially National Libraries, have a long history of activities, controlling names and creating name authorities
- this was originally aimed at authors in the traditional printed publication world, via printed and online catalogues and national bibliographies
- in its most advanced form, this lists all known name forms; identifies a preferred form; provides additional biographical and affiliation information often taken from biographical and other bibliographical sources, mentioning the sources to assist in uniquely identifying an author
- each record carries a local identifier number, which can be used to associate records in literature databases with a unique person
- this level of authority control is quite expensive, since the key part of uniquely identifying an author needs to be carried out by humans, even though there can be a high level of machine assistance

- the most well-known effort of this kind is the Library of Congress Name Authority File ([LCNAF](#))
- name authority records in MARC format can be downloaded free of charge for use in a local library system
- in the UK, the British Library (BLNAL) Name Authority List is no longer used by the British Library. Since 1997 the BL has been contributing new personal name headings to LC NAF and a retrospective merging of the files is ongoing

- several European projects support development and integration of name authority records, emanating primarily from national libraries
- the LEAF project – Linking and Exploring Authority Files – did develop several modules for a system to co-locate library authority records and authority type records from the museum and archives sector into a single LEAF file
- concluded 2004, there is only a demonstrator available today

LEAF architecture



LEAF record

CNAR of Smith, John (1634-1703)

Name: Smith, John
See Reference: Smith, John Michel
Dates: 1634-1703
Profession: ...
...
...

[Search for documents
of this autor](#) [Download this
record](#)

View this record in:

[EAC](#)
[UNIMARC Authorities](#)
[MARC21 Authorities](#)
[Authorities Format X](#)
[Authorities Format Y](#)
...

This record was created with information from the following records:

[Record 1](#) (Staatsbibliothek zu Berlin)
[Record 2](#) (Biblioteca Nacional)
[Record 3](#) (British Library)

Users annotations on this record:

[Post a new
annotation](#)

<no annotations have been posted>

- The ONESAC (One Shared Authority Control) project tried to consolidate national authority records from five European National Libraries, the LC and the UN FAO in a central repository and to colocate them without converting to a common metadata format. This is to be done based on FRANAR conceptual models, RDF and OWL. In 2004, 2,5 million records were gathered. [Poul Henrik Joergensen, *ONE shared authority control ONESAC*, presentation at ELAG 2004, <http://www.elag2004.no/papers/Jorgensen.pdf>]

- OCLC's Virtual International Authority File ([VIAF](#)) tries to foster international exchange, reuse and enhancement of authority records via matching and linking personal name authority records from the LC and the German national Library DDB. This will still allow regional and national variations to co-exist
- OCLC is also considering to use mining of the huge WorldCat catalogue to enhance authority files and to explore potential benefits of the enriched name authority files when searching and browsing WorldCat in the WorldCat Identities project [Thom Hickey, *Matching names in parallel*, presentation at Access 2006, <http://www.access2006.uottawa.ca/hickeyt.ppt>]

- [BN-OPALE PLUS](#) combines into one catalog the records for BnF's printed, sound, audiovisual, and multimedia materials from its beginnings to the present day
- In addition, this catalog offers more than 850,000 authority records containing extensive information on access rights (intellectual property rights and copyrights, subject matter, certificates, brand names, and others)

- AustLit is a non-profit collaboration between eleven Australian Universities and the National Library of Australia providing authoritative information on hundreds of thousands of creative and critical Australian literature works relating to more than 94,000 Australian authors and literary organisations. Its coverage spans 1780 to the present day
- AustLit indexes and describes Australian literature published in a range of print and electronic information sources. It also makes available selected critical articles and creative writing in full text. Researchers, bibliographers and librarians, working around the country, gather information about Australian writers and writing, providing authoritative information on and facilitating access to [Australian literature](#)

- AustLit employs a range of data models to manage information on Australian literature resources, regardless of format, and to facilitate discovery of those resources
 - the IFLA *Functional Requirements for Bibliographic Records* (FRBR) model to describe literary and creative works, augmented with 'event modeling' (based on work undertaken by the [ABC Harmony](#) and INDECS groups)
 - the [EAC](#) model to describe agents

- the decision to make resources more widely available has implications for
 - the organisations concerned (who may see this as a loss of control or ownership)
 - their staff (who may not possess the skills required to support more complex systems and a newly distributed user community)
 - the end users
- process change, and extensive staff and user training are rarely considered when deciding whether or not to release a given resource, but are crucial to ensuring the effective long-term use of any service

Inter-community Interoperability

- as traditional boundaries between institutions and disciplines begin to blur, researchers increasingly require access to information from a wide range of sources, both within and without their own subject area
- complementing work in the library sector, important initiatives are also underway in related information providing communities, such as museums and archives (example: [ABM-utvikling](#)). In many cases, both goals and problems are similar, and there is much to be gained through adopting common solutions wherever feasible.
- this synergy has been recognised, too, by the European Commission, and a significant number of projects were funded aiming at demonstrating such inter-community interoperability in practice
- crosswalks among specific formats and metadata schemes (e.g. [MARC21 Mappings](#), [Metadata Server](#) (SUB Göttingen), [UKOLN Mapping between metadata formats](#) (M. Day), [Digital libraries: metadata resources](#) (IFLA))

Example of Metadata Crosswalk Mapping

	Dublin Core	EAD	MARC 21
Title Element	Title	<titleproper>	245 00\$a (Title Statement/Title proper)
Author Element	Creator	<author>	700 1#\$a (Added Entry--Personal Name) (with \$e=author) 720\$a (Added Entry--Uncontrolled Name/Name) (with \$e=author)
Date Created Element	Date.Created	<unitdate>	260 ##\$c (Date of publication, distribution, etc.)

01142cam 2200301 a 4500
000
001 92005291
003 DLC
005 19930521155141.9
008 920219s1993 caua j 000 0 eng
010 |a 92005291
020 |a0152038655 :|c\$15.95
040 |aDLC|cDLC|dDLC
042 |alcac
050 00|aPS3537 .A618|bA88 1993
082 00|a811/.52|220
100 1 |aSandburg, Carl,|d1878-1967.
245 10|aArithmetic /|cCarl Sandburg ; illustrated as an anamorphic adventure by Ted Rand.
250 |a1 st ed.
260 |aSan Diego :|bHarcourt Brace Jovanovich,|cc1993.
300 |a1 v. (unpaged) :|bill. (some col.) ;|c26 cm.
500 |aOne Mylar sheet included in pocket.
520 |aA poem about numbers and their characteristics. Features anamorphic, or distorted, drawings which can be restored to normal by viewing from a particular angle or by viewing the image's reflection in the provided Mylar cone.
650 0|aArithmetic|xJuvenile poetry.
650 0|aChildren's poetry, American.
650 1|aArithmetic|xPoetry.
650 1|aAmerican poetry.
650 1|aVisual perception.
700 1 |aRand, Ted,|eill.

http://www.loc.gov/standards/marcxml/Sandburg/sandburg.xml - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media

Address http://www.loc.gov/standards/marcxml/Sandburg/sandburg.xml Go Links

```
- <datafield tag="100" ind1="1" ind2=">
  <subfield code="a">Sandburg, Carl,</subfield>
  <subfield code="d">1878-1967.</subfield>
</datafield>
- <datafield tag="245" ind1="1" ind2="0">
  <subfield code="a">Arithmetic /</subfield>
  <subfield code="c">Carl Sandburg ; illustrated as an anamorphic adventure by Ted Rand.</subfield>
</datafield>
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</datafield>
- <datafield tag="260" ind1="" ind2="">
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  <subfield code="b">Harcourt Brace Jovanovich,</subfield>
  <subfield code="c">c1993.</subfield>
</datafield>
- <datafield tag="300" ind1="" ind2="">
  <subfield code="a">1 v. (unpaged) :</subfield>
  <subfield code="b">ill. (some col.) ;</subfield>
  <subfield code="c">26 cm.</subfield>
</datafield>
- <datafield tag="500" ind1="" ind2="">
  <subfield code="a">One Mylar sheet included in pocket.</subfield>
</datafield>
- <datafield tag="520" ind1="" ind2="">
  <subfield code="a">A poem about numbers and their characteristics. Features anamorphic, or distorted, drawings which can be
  restored to normal by viewing from a particular angle or by viewing the image's reflection in the provided Mylar cone.</subfield>
</datafield>
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</datafield>
- <datafield tag="650" ind1="" ind2="1">
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  <subfield code="x">Poetry.</subfield>
</datafield>
```

Done Internet

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http://www.loc.gov/standards/marcxml/Sandburg/sandburgdc.xml - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media

Address <http://www.loc.gov/standards/marcxml/Sandburg/sandburgdc.xml> Go Links

```
<?xml version="1.0" ?>
- <dc xmlns="http://purl.org/dc/elements/1.1/">
  <title>Arithmetic /</title>
  <creator>Sandburg, Carl, 1878-1967.</creator>
  <creator>Rand, Ted, ill.</creator>
  <type />
  <publisher>San Diego :Harcourt Brace Jovanovich,</publisher>
  <date>c1993.</date>
  <language>eng</language>
  <description>A poem about numbers and their characteristics. Features anamorphic, or distorted, drawings which can be restored to normal
  by viewing from a particular angle or by viewing the image's reflection in the provided Mylar cone.</description>
  <description>One Mylar sheet included in pocket.</description>
  <subject>Arithmetic</subject>
  <subject>Children's poetry, American.</subject>
  <subject>Arithmetic</subject>
  <subject>American poetry.</subject>
  <subject>Visual perception.</subject>
</dc>
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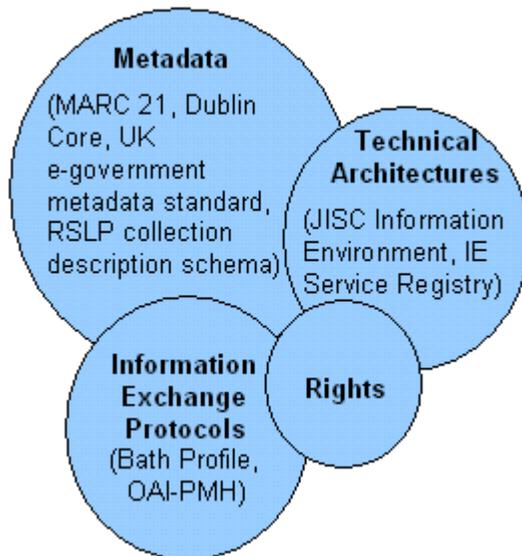
Done Internet

start FAXtnt - Mi... Novell Grou... NoteTab Li... Metadata ... Microsoft P... http://ww... 09:09 AM

International Interoperability

- each of the key issues identified above is magnified when considered on an international scale, where differences in technical approach, working practice and organisation have been consolidated over many years
- issues related to the language in which resources are provided and described become increasingly significant when dealing with those delivered from or provided for other countries

The importance of being interoperable



- being seen to "be interoperable" is becoming increasingly important as people wish to find and use high quality information resources, possibly from many different sources
- digital information services should facilitate that process, and, increasingly, service providers face the challenge of considering how their own services will be used in combination with other services

Adding value to services

- an interoperable organisation is able to maximise the value and reuse potential of information
- it is also able to exchange its own information effectively with other equally interoperable bodies, allowing new knowledge to be generated from the identification of relationships between previously unrelated sets of data
- changing internal systems and practices to make them interoperable is a far from simple task
- however, the greater flexibility and benefits for the organisation and those making use of information it publishes are potentially incalculable

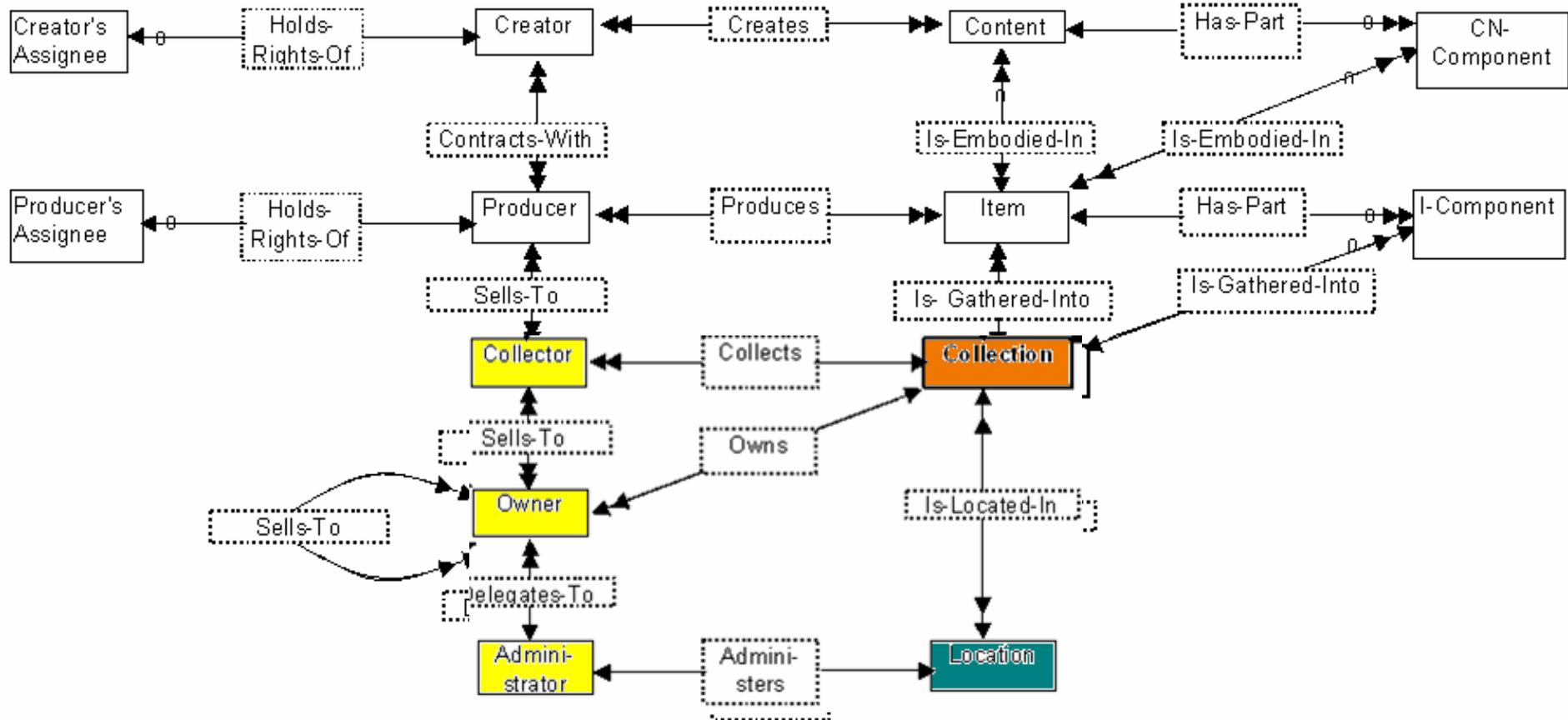
- the MICHAEL and MICHAEL Plus projects have been funded through the [European Commission's eTen programme](#), to establish a new service for the European cultural heritage
- the MICHAEL project is a partnership between France, Italy and the UK to deploy a cultural portal platform that was developed in France. MICHAEL Plus extends the MICHAEL project to the Czech Republic, Finland, Germany, Greece, Hungary, Malta, the Netherlands, Poland, Portugal, Spain and Sweden. The two projects are closely aligned. The projects focus on the integration of national initiatives in digitisation of the cultural heritage and interoperability between national cultural portals to promote access to digital contents from museums, libraries and archives

Objectives

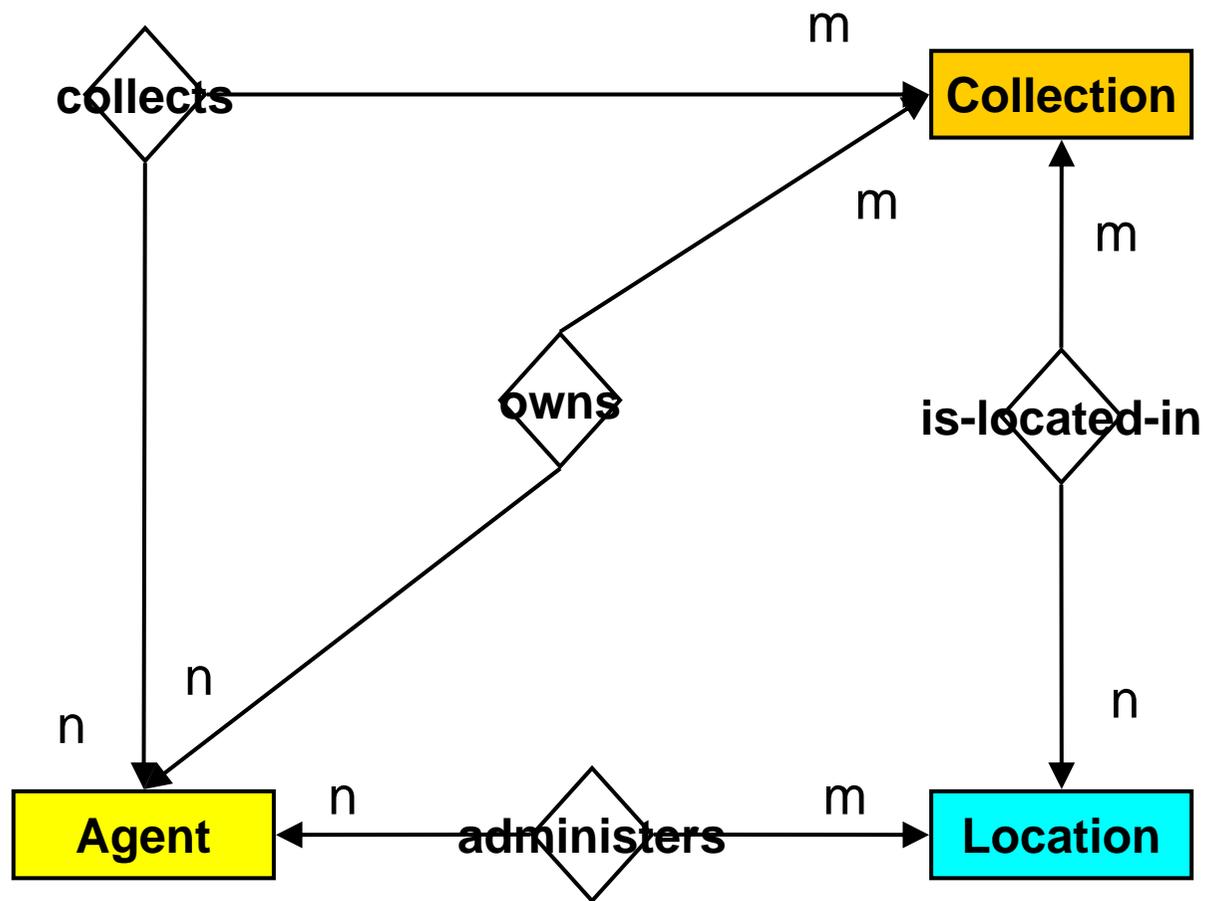
- A European cultural heritage inventory, available to all and providing access to cultural heritage resources
- Sustainable management for the project to continue
- Endorsement and implementation at a national government level, in order to underpin further funding as required
- A methodology and technical platform, which makes it easy to add new national instances of MICHAEL, thus growing the content and user bases

- The MICHAEL data model for multilingual digital cultural heritage inventories
- An open source technical platform for national instances built on Apache Tomcat, Cocoon, XtoGen, XML etc.
- Interoperability protocols for national instances to contribute data to the European service
- European MICHAEL search portal
- Methodology and model which is easy to deploy in additional countries

RSLP CD Model & Schema



RSLP CD Schema (detail)



RSLP Collection Description

- Cornucopia <http://www.cornucopia.org.uk>
- Cecilia <http://www.cecilia-uk.org>
- RASCAL Research and Special Collections Available Locally (Northern Ireland)
<http://www.rascal.ac.uk>
- Archvies Hub <http://www.archiveshub.ac.uk>
- SCONE Scottish Collections Network
<http://scone.strath.ac.uk/Service/Index.cfm>
- Tap into Bath
<http://www.bath.ac.uk/library/tapintobath/>

Welcome to Cornucopia, an online database of information about more than 6,000 collections in the UK's museums, galleries, archives and libraries. Whether you are interested in painters or politicians, dinosaurs or space travel, the Romans or the Victorians, Cornucopia can tell you what is available and where to see it. There are three ways to search Cornucopia:

1. You can **BROWSE THE DATABASE** using the categories below:



2. You can **ENTER A SEARCH TERM** in the Quicksearch box below.

Cornucopia Quicksearch

3. You can use the **ADVANCED SEARCH**

MLA Cornucopia
MUSEUMS LIBRARIES ARCHIVES COUNCIL Discovering UK Collections

Help | News | Access Options | Advanced Search

Cornucopia Quicksearch:

Home Time People Place Subject Culture Institution myCollection

Home > Search > Oral history

Search

Further topics

- Audio tapes

Page: [Start][1][2][3][4] [Next]

Collection Descriptions

Archives (Newark Houses Museum) Newark Houses Museum (Social History) has always taken an integrated approach to interpretation and use of the colle...	Select: <input type="checkbox"/>
Archives Collection (Avoncroft Museum Of Historic Buildings) There is a wide-ranging archive of material related to the buildings and associated trades covered by the object coll...	Select: <input type="checkbox"/>
National Tramway Museum Oral History Collection (National Tramway Museum) Small collection of oral history tapes.	Select: <input type="checkbox"/>
Oral History (Flintham Museum) A small collection of oral history tapes.	Select: <input type="checkbox"/>
Oral History (Erewash Museum) A collection of recordings related to local people and local history. Active policy towards recording.	Select: <input type="checkbox"/>
Oral History (Ruddington Framework Knitters Museum) Recordings of reminiscences relevant to the knitting industry in the area.	Select: <input type="checkbox"/>
Oral history (Harborough Museum) The collection includes recordings of local people and also holds recordings relating to experiences of Symington's f...	Select: <input type="checkbox"/>
Oral History (Woodhall Spa Cottage Museum) Collection of personal reminiscences related to Woodhall Spa, Lincolnshire.	Select: <input type="checkbox"/>
Oral History Collection (True's Yard Fishing Heritage Museum) Archived recordings of North Enders	Select: <input type="checkbox"/>
Oral History Collection (Royal Signals Museum)	Select: <input type="checkbox"/>
Oral History Collection (Museum In The Park) Oral history records have been made by the anthropologist Dr J Sarsby of first hand accounts of those employed in the...	Select: <input type="checkbox"/>
Oral History Collection (Museum Of The Staffordshire Regiment (The Prince Of Wales's)) Recordings of the memories of serving and recently retired members of the Regiment.	Select: <input type="checkbox"/>
Oral History Collection (Tenbury Museum)	Select: <input type="checkbox"/>

MLA Cornucopia
MUSEUMS LIBRARIES ARCHIVES COUNCIL Discovering UK Collections

Help | News | Access Options | Advanced Search

Cornucopia Quicksearch:

Home Time People Place Subject Culture Institution myCollection

Home > Search > Subject

Search

<ul style="list-style-type: none"> Archaeology (341) Archives (501) Art & Design (1948) Building (5) Coins & Medals (256) Costume & Textile (502) Culture (172) 	<ul style="list-style-type: none"> Education Events Health (117) History of Science (367) Home & Garden (36) Industry & commerce (600) Information and communication Mantime (92) 	<ul style="list-style-type: none"> Natural Sciences (726) Oral history (109) Past Societies (3) People (281) Politics, law and economics
--	---	---

Credits | Home | Help | About | News | Privacy | Contact | Access Options

Site design by Orangeleaf Systems

across other

etails.

Collection Summary

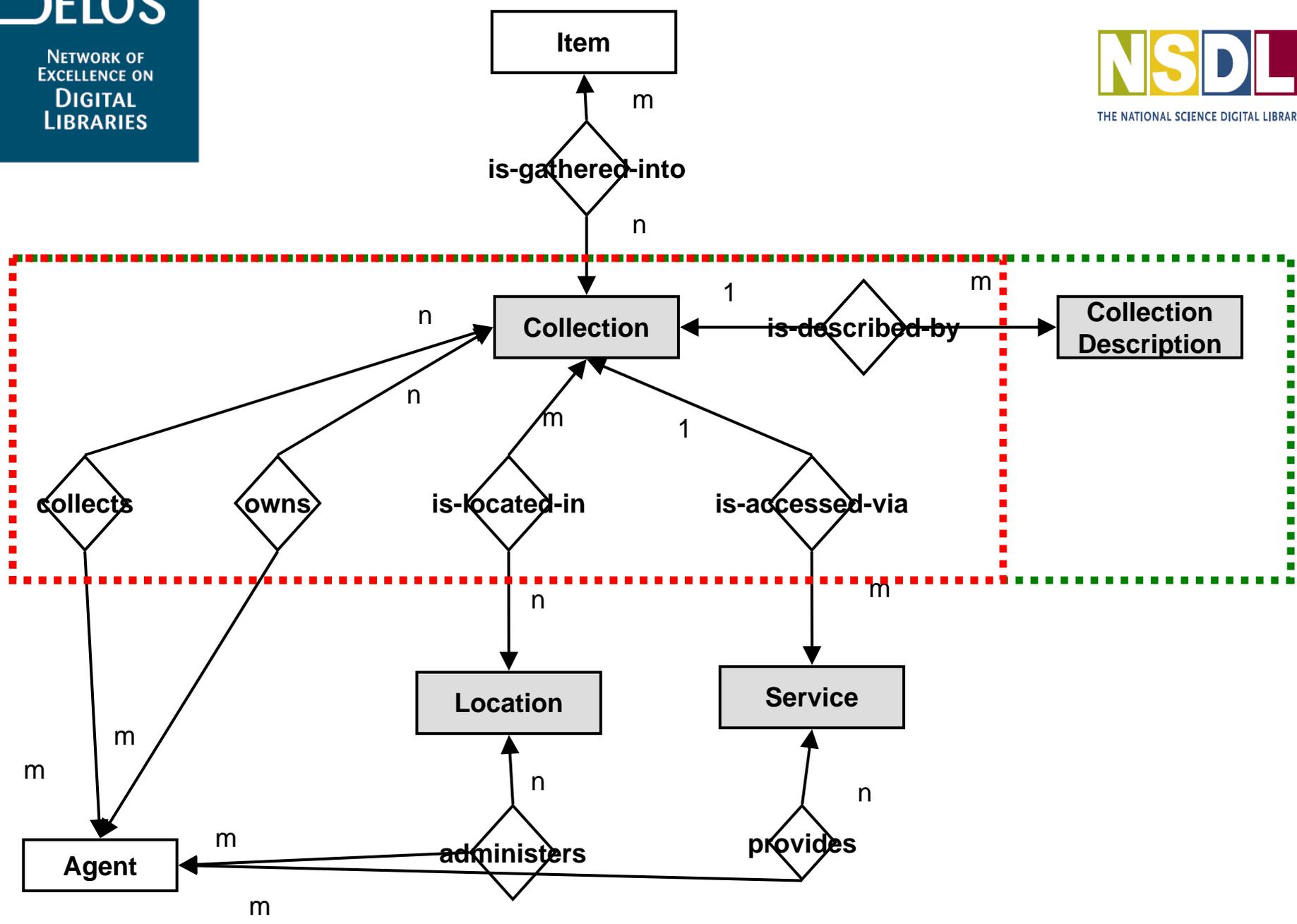
Collection Title	Oral History
Description	Recordings of reminiscences relevant to the knitting industry in the area.
Format	5 Objects ,
Date range of collection	-
Accumulation Dates	-
Suggested Audience	Not Specific
Associated People or Organisations	
Associated Places	Ruddington, Nottinghamshire ,
Associated Times	19th century - late Victorian 1876-1899 , 20th century - early 1900-1930 ,
This collection is about	Oral history , Framework Knitting , Science & Industry , Textile manufacture , hosiery ,

Location Details

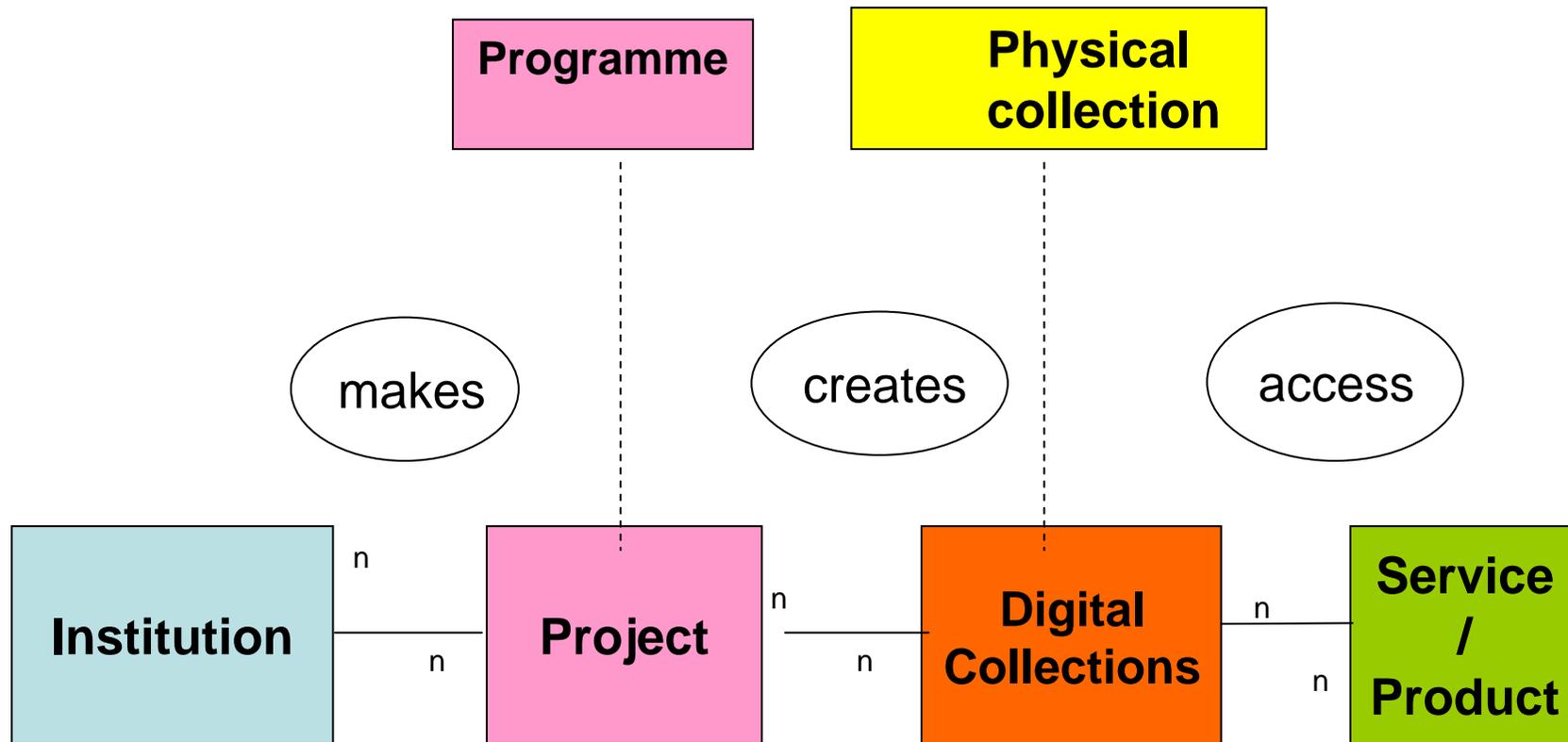
Ruddington Framework Knitters Museum	<i>Chapel Street Ruddington Nottinghamshire NG11 6HE United Kingdom</i>
DOMUS	Open Map
Website	EM000056
Telephone	http://www.rfkm.org
Visiting Information	0115 984 6914
Disabled access possible.	Open 10.30am - 4.30pm Wed to Sat.
Building Information	The museum site is a grouping of purpose built, listed frameshops, cottages and outbuildings arranged around a garden courtyard, together with a former chapel in which many of the knitters worshipped.
Collections Overview	Collections consist of items which interpret the buildings, machinery, skills, working environment and living conditions of the framework knitters of Ruddington and its environs. Including restored working and living conditions, 25 hand frames, collection of circular sock machines and allied equipment.
Display Overview	The site has been restored to show the working and living conditions of the framework knitters who occupied it throughout the 19th century. Displays include working machinery, audio visuals and demonstrations.
	 For details of other collections held at the same location: See the location record

Additional Collection Information

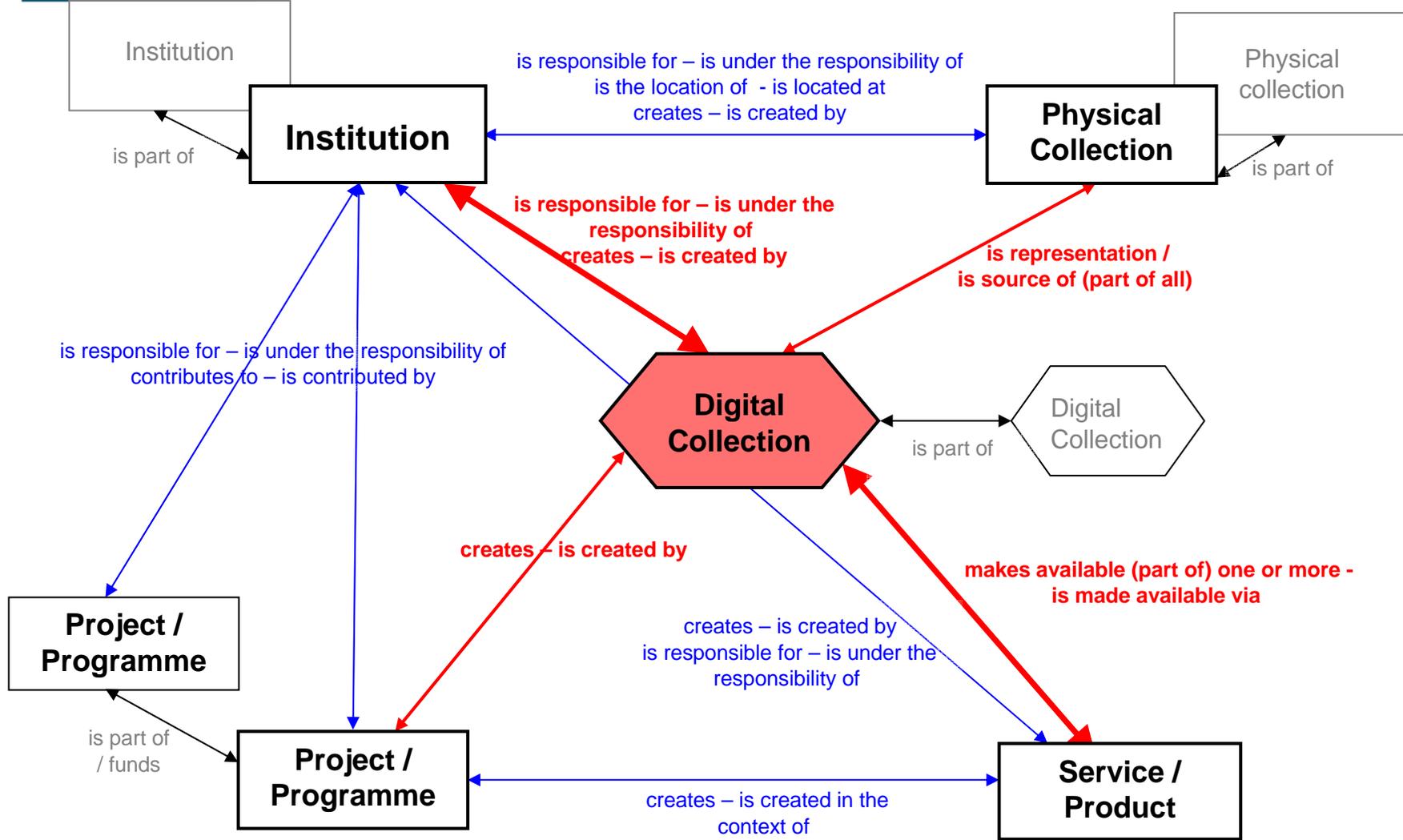
Related Publications	
Management Information (Type)	Archive. ,
Collection Owner(s)	Ruddington Framework Knitters' Shops Preservation Trust ,
Collection Creator(s)	
Collection Collector(s)	
Collection Custodians(s)	
Associated Collection(s)	



MINERVA data model for describing digital collections



Entities and relationships





Michael Multilingual Inventory
of Cultural Heritage in Europe



path: [Home](#) - Documentation

- [Project description](#)
- [Consortium](#)
- [Technology](#)
- [Events](#)
- Documentation
- [Links](#)

Documentation

Project Documents

- MICHAEL data model:
 - EN [[pdf 63kb](#)]
 - FR [[pdf](#)]
 - IT [[pdf 63kb](#)]
- MICHAEL XML schema
- MICHAEL collection description manual:
 - EN [[html](#)]

Technical documents

- MICHAEL Editor's Guide: EN [[pdf 1.4mb](#)]
 - Getting started:
 - EN [[html](#)] - [[pdf 520kb](#)]
 - IT [[pdf 583kb](#)]
 - Reference:
 - EN [[html](#)]
 - Administration
 - EN [[html](#)]
- MICHAEL Implementer's guide:
 - EN [[html](#)]

Archive

- Xdepo platform documentation: FR [[html](#)]
 - Xdepo: Guida per l'utente [[pdf 2mb](#)]
 - Xdepo: Guida all'implementazione [[pdf 427kb](#)]

MICHAEL Project

MICHAEL data model
Version 1.0

Document written by
MICHAEL

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September 30th 2005

1) Abstract

This document is the reference definition of the MICHAEL data model. The data model can represent XML descriptions of digital collections and related information: institutions, projects or programmes, services or products and physical collections.

Table of contents

1) Introduction	1
2) Definitions	1
3) Entities	2
4) Relations	2
5) Fields	4
6) Annex A : XML schema	11

The UK instance

Michael Multilingual Inventory of Cultural Heritage in Europe

M L A
 MUSEUMS LIBRARIES ARCHIVES COUNCIL

Quicksearch

Browse collections

- Subject / theme
- Places
- Time
- People
- Type of material
- Service
- New collections
- Advanced search

Organisations and programmes

- Organisations & Funding Programmes

Your collections

- Your collections

Help

- Tell us about a collection
- Tools for developers

Subject/theme **Places** **Time** **People** **Material**

Welcome to MICHAEL-UK.

Our aim is to offer you simple and quick access to the rich variety of digital material from UK museums, libraries and archives. The online catalogue describes digital collections and associated services or multimedia productions (such as websites, electronic learning resources and CDs). Whether you are interested in Fine Art or History, the Middle Ages or the Victorians, your local area or the collections that have been digitised by your local cultural institutions, MICHAEL-UK can help you to find out what is available and how to see it.

MICHAEL-UK is the national instance of the European project MICHAEL.

<http://www.michael-culture.org.uk/mpf/pub-uk/index.html>

The French instance

PATRIMOINE NUMÉRIQUE
 Catalogue des collections numérisées

À propos | FAQ | RSS | aide | contact | crédits

English | Italiano

Recherche rapide [OK] Recherche avancée

1125 COLLECTIONS

- Sujet
- Type de document
- Période & Siècle
- Type d'institution
- Toutes les collections
- Tous les sites, cd, dvd

453 INSTITUTIONS

- Type d'institution
- Toutes les institutions

ACCÈS GÉOGRAPHIQUE

+ dom-tom

- Affiches de la Deuxième Guerre mondiale. CHAN -

Un catalogue collectif

Le catalogue en ligne du patrimoine culturel numérisé décrit les collections numérisées et les productions multimédia associées (site internet, dévédérom, cédérom...). Il recense les institutions à l'origine de projets de numérisation en France. Vous êtes intéressé par le Moyen Age ou le XXe siècle, un état civil pour construire votre arbre généalogique ou le patrimoine de votre région, le catalogue peut vous aider à chercher, vous indiquer où trouver. Le catalogue est le volet national du projet européen Michael.

Tous les sujets | Tous les types de documents

DERNIÈRES COLLECTIONS

1895. "L'homme-fille de Jésus"
 12. Marguerite-fille de Jésus
 13. Sébastien-fille de Jésus
 14. Étienne-fille de Jésus
 15. Marthe-fille de Jésus
 16. Jeanne-fille de Jésus

Lire la suite

DOSSIER ENLUMINURES

Lire le dossier
 Tous les dossiers

ESPACE PROFESSIONNEL

- Inscrire vos collections
- Faire des liens
- Éditer votre dossier
- S'informer

Michael Multilingual Inventory

minerva Europe

<http://www.michael-culture.fr>

The Italian instance

MINISTERO PER I BENI E LE ATTIVITÀ CULTURALI

Michael
 Multilingual Inventory of Cultural Heritage in Europe

Cerca una collezione digitale

- Tema
- Area geografica
- Periodo
- Personaggi
- Tipo di documento digitale
- Scorri i titoli

Cerca servizio

- Tipo di servizio di accesso
- Pubblico di riferimento
- Scorri i titoli dei servizi di accesso

Cerca collezione fisica

- Tipo di oggetto fisico correlato
- Scorri i titoli delle collezioni fisiche correlate

Cerca istituzione

- Tipo di istituzione
- Area geografica
- Scorri i nomi

Michael Italia

Le collezioni culturali digitali italiane

Benvenuto sul portale italiano MICHAEL!

Scopri ed esplora il patrimonio culturale digitale italiano! Con il servizio MICHAEL è possibile conoscere le collezioni digitali di musei, archivi, biblioteche, uffici del catalogo, soprintendenze e altre istituzioni culturali italiane. Che siate interessati all'archeologia o all'arte contemporanea, alla musica, a Roma antica o agli strumenti scientifici, MICHAEL vi mostra le risorse disponibili.

Sono attualmente descritte 354 collezioni digitali e 191 istituzioni.

Tema Area geografica Periodo Personaggi Tipo di documento digitale

Nuove collezioni
 Guarda le ultime collezioni pubblicate sul portale italiano MICHAEL.

Percorsi tematici
 Servizio attualmente non disponibile.

cultura italia
 APRITEVI AL SAPERE

Michael

eTEN

© 2005 MICHAEL-IT - Copyright | Disclaimer | Quest'opera è pubblicata sotto una Licenza Creative Commons.

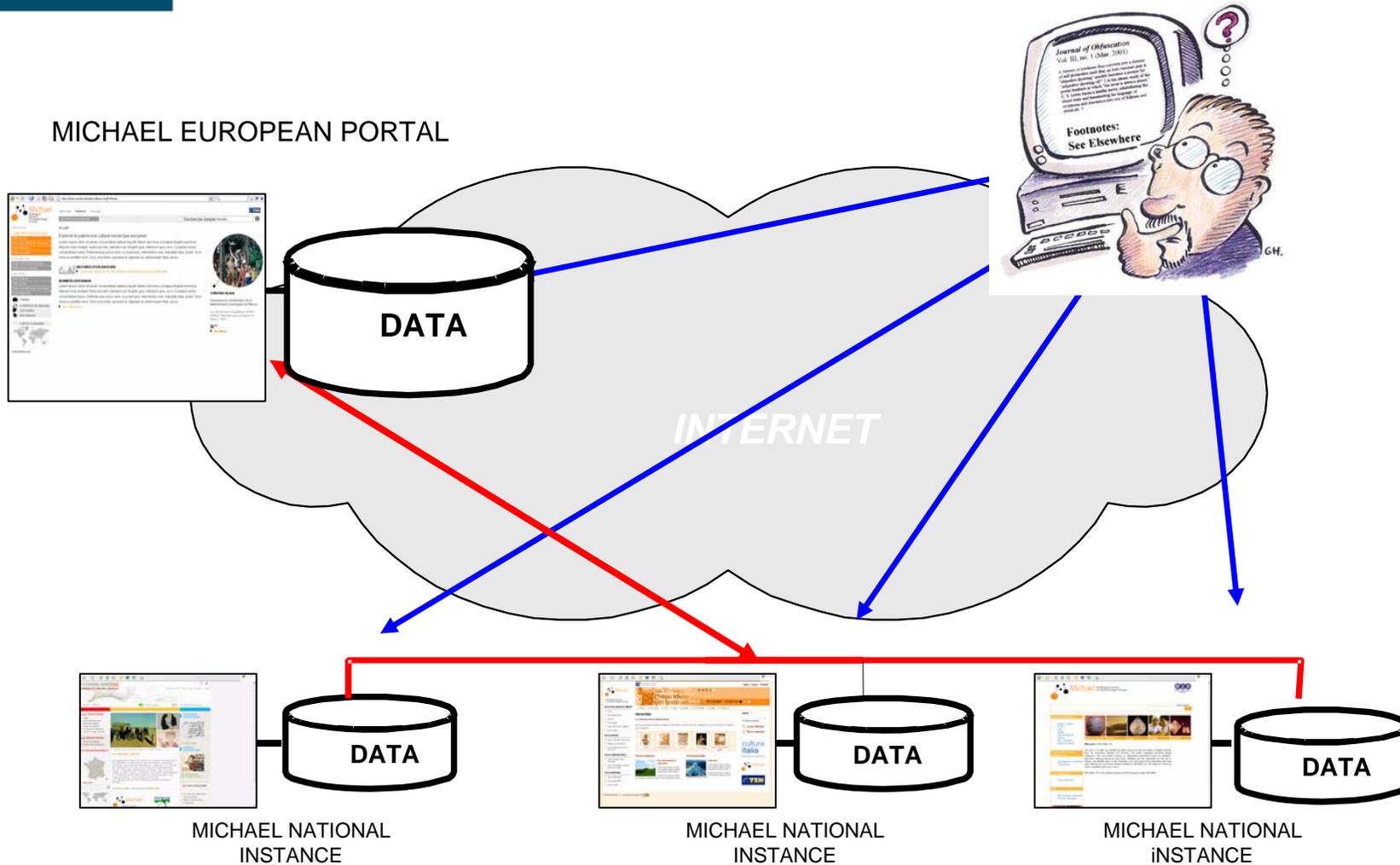
The European portal

The screenshot shows the Michael European Portal website. At the top left is the Michael logo with the text "Multilingual Inventory of Cultural Heritage in Europe". Navigation links include "ENGLISH", "FRANÇAIS", and "ITALIANO". A search bar with "Quick search" and a "TEN" logo is on the right. The main content area features a "Home" section with the heading "Explore the European digital cultural heritage" and a paragraph describing the service. Below this is a "STORIES" section with a link to "Read some stories from users of the MICHAEL European Portal". A "LATEST EDITORIAL - DESIGN IN EUROPE" section follows, mentioning Nikolaus Pevsner and William Morris. On the right side, there is a "Today's collection" section titled "Virtual mathematic models" with a circular image of mathematical models and a link to "Read more...". A left sidebar contains various navigation options like "Digital Collections", "Institutions", "Services", and "CLICKABLE MAP".

<http://www.michael-culture.org>

Searching in MICHAEL

MICHAEL EUROPEAN PORTAL



The European Library

- TEL-ME-MOR stands for ' The European Library: Modular Extensions for Mediating Online Resources'
- the project was selected by the European Commission, Directorate E - Content, as a result of the third call for proposals published in 2004, under the Sixth Framework Programme (FP6)
- in particular, it was funded within the *Activity 2.3.6.1*, which was aimed at stimulating, encouraging and facilitating the participation of organisations from the New Member States and the Associated Candidate Countries in the activities of the [Information Society Technologies \(IST\) area](#) of the European Commission

Objectives of TEL-ME-MOR

- TEL-ME-MOR is supporting the 10 national libraries from the New Member States, which are partners in the project, in becoming full members of [The European Library](#), an initiative, established under the aegis of the Conference of European National Librarians ([CENL](#)), providing unified access to the electronic resources of the main European National Libraries as well as to other library services
- by the end of the project, a comprehensive and easily searchable pan-European collection of top quality information resources, covering all subject areas of interest to the research community, should be available on-line, via The European Library. Multilingual interfaces are developed to enable users from the New Member States to access the on-line facility in their own language
- the second objective of TEL-ME-MOR is to raise awareness and disseminate information on the opportunities for participation in future projects, aimed at fostering an increased participation of institutions and organisations from the New Member States in future calls for proposals published by the European Commission within the Cultural Heritage and Learning sectors of the IST Programme

Target audiences

- TEL-ME-MOR addresses the cultural, educational, industrial and public sectors. It aims to bring together the various professional domain networks, the authorities which are responsible for the institutions and their services to the research sector, the research, scholarly and IT communities. In particular, the project targets the following audiences:
 - Libraries, museums, archives
 - Educational institutions (schools, universities, etc.)
 - Government agencies and policy makers
 - Local authorities
 - Researchers
 - ICT Small and Medium Enterprises (SMEs)
 - Individual users

- when making their collections available in The European Library, full-partner National Libraries need to provide two types of metadata
 - metadata about the collection itself: collection level descriptions
 - metadata about the objects themselves: metadata records / object level metadata

- help users to select collections (e.g. title, description & logo of the collection)
- available in multiple languages
- standardised:
 - TEL Application Profile for Collections
 - NISO Collection Description Specification
- submitted / edited via a web form
- stored in XML format

Help users to select collections

- Encourage users to select collections with relevant content before searching
- Optimal searching: up to 15 collections



- Browse collections by subject
- Search collections by description
- Browse all collections

Collection title, description & logo

The European Library

Language: English (eng) Register | Login

SEARCH COLLECTIONS TREASURES LIBRARIES ABOUT US

Browse collections by subject Search collections by description Browse all the collections

choose your own collections

- ▶ The European Library
- ▶ Austria
- ▶ Croatia
- ▶ Cyprus
- ▶ Czech Republic
- ▶ Denmark
- ▶ Estonia
- ▶ Finland
- ▶ France
- ▶ Germany
- ▶ Hungary
- ▶ Italy-Florence

SELECT / DESELECT ALL

SAVE

National Library of Estonia

top of page

<input type="checkbox"/>	select / deselect all	
<input type="checkbox"/>	Online catalog of the National Library of Estonia (ESTER)	
	Online catalog of the National Library of Estonia (is part of the shared catalogue of several research libraries)	
	▶ Online catalog of the National Library of Estonia (ESTER)	
<input type="checkbox"/>	Digital archive DIGAR	
	Digital archive meeting the international standards for long-term preservation. Collects, preserves and makes available digital pre-print originals and online publications issued by public sector institutions. Compiled since 2004. In December 2005 it contained ca 540 objects. Annual growth is ca 700 publications.	
	▶ Digital archive DIGAR	
	Index Scriptorum Estoniae (ISE)	
	Bibliographic databases of articles on humanities and social sciences (8 subject subdatabases in total). Databases are compiled since 1993 on the basis of newspapers, journals and article collections published in Estonia. The	

The European Library Metadata Registry

> TEL Metadata Registry

Registry elements | Add Registry element | TEL Handbook

- Introduction
- Terms and Elements
- Tel Application Profiles

Application Profile for collection descriptions

version 1.5



National Information Standards Organization

NISO MetaSearch Initiative

[NISO Z39.91-200x, Collection Description Specification](#)

Authors: Standards Committee BB (Task Group 2): Collection & Service Descriptions

Abstract: This draft standard defines a means of describing collections, where a collection is defined as an aggregation of items. It takes the form of a Dublin Core Application Profile, a specification of how metadata terms from the Dublin Core metadata vocabularies and from other metadata vocabularies, some constructed for use in association with this Dublin Core application profile, are used to construct a description of a collection, in accordance with the DCMI Abstract Model. It also specifies an XML binding for serializing such descriptions for interchange between applications.

Status: Draft Standard for Trial Use. Effective November 1, 2005 - October 31, 2006

Step 1. Submit new collection description

Add more elements by using the elements table below this one 

Enter a value and then choose language it is in.
 Add elements through the element list below. Delete items by pressing the bin of that row.

Element	Value	Language	
update_date: *	2006-11-07		
Title: *	<input type="text"/>	en 	
Title:	<input type="text"/>	en 	
Description: *	<input type="text"/>	en 	
Description:	<input type="text"/>	en 	

Edited via a web form

The European Library - Collection Description Editor - Microsoft Internet Explorer

Bestand Bewerken Beeld Favorieten Extra Help

Vorige Zoeken Favorieten

Adres <http://dev.theeuropeanlibrary.org/FUJORE/develop/cdedit.php?recno=collections:a0071>

The European Library Collection Description Editor

>> TEL Handbook >> Collections of Austria >> Edit collection collections:a0071 TEL Handbook

Record

collections:a0048

collections:a0071

collections:a0072

collections:a0177

Step 1. Edit collection description

Add more elements by using the elements table below this one

Enter a value and the choose language it is in.
 Add elements through the element list below. Delete items by pressing the bin of that row.

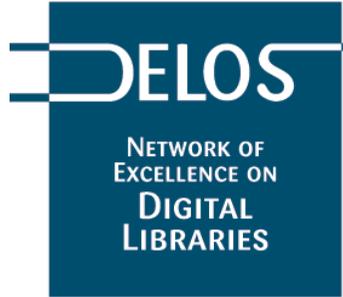
Element	Value	Language	
update_date: *	2006-11-24		
isAccessedVia: *	SRU		
Spatial_coverage:		en	🗑
Temporal_coverage:		en	🗑
RecordSchema: *			
Size: *		en	
Size:		en	🗑
ThumbnailURL:			🗑
CollectionType:			🗑
Title: *	Online-Katalog der Österreichischen Nationalbibliothek a	de	
Description: *	In diesem Online-Katalog sind all jene Werke verzeichnet, die ab 1992 erworben wurden: alle Druckschriften (inkl. Mikroformen und AV-Medien) ab	de	

Internet

- the EL portal searches the local databases of partner libraries
- records are harvested into central index
- metadata records are converted to TEL Application Profile for objects
- the metadata records can then
 - be displayed in The European Library
 - provide access to the digital item or object
 - link to record in native interface

TEL application profiles

- The European Library Application Profiles developed during the TEL project are based on Dublin Core Libraries Application Profile (DC-Lib)
 - TEL AP for collections
 - TEL AP for objects
- all terms are stored and described in [The European Library Metadata Registry](#), which is the place
 - to store all the terms used in both application profiles
 - to describe the terms
 - to provide guidance on how they may be used
- Application Profiles are not static – need to be reviewed and updated; this development process is part of the registry, that is managed by the TEL Metadata Working Group



Cooperation in Europe

