A Dublin Core Application Profile in the Agricultural Domain

DC-2001
International Conference on
Dublin Core and Metadata Applications 2001
Tokyo, Japan - October 22-26, 2001

Irene Onyancha, Johannes Keizer, Stephen Katz

Food and Agriculture Organization (FAO) of the United Nations
Library & Documentation Systems Division (GIL)
AGRIS/CARIS & FAO Documentation Group
Viale Delle Terme di Caracalla, Rome 00100, Italy
Irene.Onyancha@fao.org, Johannes.Keizer@fao.org, Stephen.Katz@fao.org

Abstract

This report outlines a proposed metadata framework for resource discovery of agricultural resources, and in particular to describe information resources in agricultural sciences. The overall work is the result of a collaborative effort between a number of partners in the agricultural community and the Library and Documentation Systems Division of FAO. The endeavour is formally referred to as the "Agricultural Metadata Standards Initiative" (Agstandards)[1]. It is based upon the elements and qualifiers proposed by the Dublin Core Metadata Initiative (DCMI).

Keywords: Metadata, Interoperability, Standards, Dublin Core, Agricultural Information

1.0 Introduction

Resource description has emerged as a challenge that impedes resource discovery even though network technologies have lowered other challenges including geographical barriers. This is because resource discovery varies depending on the structure, type and content of resource and with the interests of the information keepers. Further, complex needs of users require domain specific information systems to be queried in parallel to enable access to distributed information archives. To meet such demands, there is a need for a framework that would allow information access regardless of the above-mentioned barriers. The Dublin core initiative is a potential example of such a format because of its characteristics that distinguish it as a prime candidate for resource description and primary resource discovery.

The report first provides the overall context for the metadata framework; why the standard is needed; how the work was done, and then offers thoughts on the way forward from here. Section 4 provides the elements and qualifiers of the proposed standard presented in a hierarchical structure. The hierarchical structure offers a flexible framework to implement the proposed standard at different levels of granularity, depending on the how rich each metadata source is. In its simplest form, metadata can even be supplied at the most general level of 13 core fields. A more detailed description of all the elements and the qualifiers, including information on definitions, rules, and data typing is presented in a paper at the FAO website[2].

2.0 Objectives

The overall objective of the agricultural metadata framework is to define a low-barrier and richer interoperability layers using emerging standards that aim to facilitate the efficient dissemination of agricultural content. The metadata set consists of core elements and qualifiers that are generic to the description of all agricultural information resources.

The specific goals are:

1. To facilitate the discovery of agricultural information resources;
2. To assist the management of resources by the owners;
3. To enable interoperability between different metadata structures through a simple common format;
4. To develop a metadata framework that is compliant with other standards such as MARC, ISBD and new emerging ones like Dublin Core;
5. To encode the metadata framework using new tools such as Resource Description Framework (RDF) and the Extensible Markup Language (XML). This in turn will greatly facilitate the exchange of information by:
    - Providing an overall metadata framework for better search capabilities on the internet
    - Offering a mechanism for interoperability between applications and
    - Supplying a potential means for automated processing of web resources

[1] More details about the Agstandards initiative can be found at: http://www.fao.org/agris/MagazineArchive/magazine/TaskForceonDCMI.htm.

[2] A detailed description of the elements of the Agricultural Application Profile can be found at: http://www.fao.org/agris/MagazineArchive/MetaData/ElementFinal.doc.

3.0 Strategy and Methodology Adopted

With respect to the strategy and methodology adopted to formulate the metadata framework, specific actions were taken to:

- Develop a conceptual map of the different types of information resources used in agriculture.
- Evaluate standards and common resource description practices currently used in the agricultural domain.
- Initially focus on the description of information (bibliographic) resources.
- Develop a specific application profile for description of resources.
- Document a full element description for these resources using the set of attributes recommended by the Dublin Core Metadata Initiative.

As a result of adopting this strategy and methodology in a participatory manner with all partners of the Agricultural Metadata Standards Initiative, a list of 13 elements for agricultural resources description was proposed.

4.0 Metadata Element Set for the Description of Agricultural Information Resources

This section presents the proposed elements in a hierarchical structure. Preference is given to notation, vocabularies and terms that are currently used in describing agricultural resources. Full description of these elements can be viewed.

Introduction

1. The element ***Creator*** has been revised to represent all the agent elements namely, ***Creator, Contributor and Publisher***
2. Some attributes of elements that have been in the past considered necessary in resource description are not included in this description of a specific resource because this information is currently not considered as primary information that is important for discovery of a particular resource. However to include this information which is also important for resource discovery at a secondary level, ***Authority files*** shall be created and linked to the metadata. Element that will have Authority files include: ***Author, Researcher, Corporate Author, Publisher*** and ***Type***, qualifiers ***Event*** (Conferences, Workshops, Meetings)

The hierarchical notation presents the different levels of description, which is noted by the use of different formats and colours as indicated in the legend in the footnote.

I. Proposed core elements and the qualifiers for agricultural resources description[3]

1. **Core element: Creator (new)**

Qualifiers for Agricultural Resources

(DC) Corporate author
Name
(DC) Personal author
Name
(DC) Publisher
Name
(DC) Editor
Name
(DC) Compiler
Name

[3]

Legend

Bold:	DC Elements & Proposed elements for agricultural resources
Underlined:	Qualifiers for agricultural resource description
Italic:	Sub-elements or attributes of the qualifiers
Blue:	Attributes of sub-elements

Recommended DC qualifiers are noted with prefix (DC) while the new qualifiers are noted with (new)

2. **Core element: Rights**
Qualifiers for Agricultural Resources

(DC) Statement
(new)Terms of use
(new) Patent

3. **Core element: Title**
Qualifiers for Agricultural Resources

(DC) Main title
(new) Title supplement
(DC) Alternative title

4. **Core element: Relation**
Qualifiers for Agricultural Resources

(DC) Is Part Of
part of monograph (AM)
(Unique identifier of related record. If URI should be PURL)
part of monographic series (AMS)
(Unique identifier of related record. If URI should be PURL)
part of series (AS)
(Unique identifier of related record. If URI should be PURL)
(DC) Has Part (analytical)
(Unique identifier of related record. If URI should be PURL)
(DC) Edition
Version Of Monograph,
(Unique identifier of other version)
URI
(Unique identifier if URI should be PURL)
(DC) References
Related Records
(Unique identifiers of related record. If URI should be PURL)
Related Language Versions
(Unique identifiers of related language versions

5. **Core element: Subject**
Qualifiers for Agricultural Resources

(DC) Subject Classification
AGRIS Subject Categories
CABI Codes
LCSH
DDC
LCC
UDC

(DC) Thesaurus
CABI Thesaurus
AGROVOC Thesaurus
NAL Thesaurus
ASFA Thesaurus

6**. Core element: Coverage**

Qualifiers for Agricultural Resources

- (DC) Thesaurus
  - AGROVOC Thesaurus
  - GTN
- (DC) Country codes
  - ISO 3166 country codes

7. **Core element: Description**

Qualifiers for Agricultural Resources

- (DC) Abstract
- (DC) Table of contents
- (new) Notes
- (new) Holdings
  - Location
    - Address
  - Online
    - URI (PURL)

8. **Core element: Date**

Qualifiers for Agricultural Resources

- (DC) Publication date
- (DC) Date of Creation
- (DC) Date of Modification

9. **Core element: Identifier**

Qualifiers for Agricultural Resources

- URI
- ISBN
- ISSN
- Report no.
- Accession no.
- Call no.
- Patent no.
- Job no.

10. **Core Element: Language**

Qualifiers for Agricultural Resources

- (DC) Language of text
  - ISO 639 language codes

11. **Core element: Type**

Qualifiers for Agricultural Resources

- (DC) Collection
  - Monographs
  - Serials
  - Monographic serials
  - Web Pages
  - Analyticals
- (new) Document class
  - Publication
  - Non conventional

- (new) Literary indicator
  - Grey Literature
  - Legislation
  - Standard
  - Bibliography
  - Summary
  - Statistical data
  - Directory
  - Thesis
- (DC) Event
  - Conference
  - Training course
  - Workshops
  - Seminars
  - Consultations
- (DC) Images
  - Photograph
  - Film
  - Picture
  - Map
  - Slide
  - Microfiche
  - Video Cassettes
- (DC) Sound
  - Audio cassettes
  - Digital Audio
- (DC) Interactive Resources
  - CD-ROM
  - Web Forms
- (DC) Software
- (DC) Dataset
- (DC) Text

12. **Core element: Format**

Qualifiers for Agricultural Resources

- (DC) Medium
  - Internet Media Type, (IMT)
    - Application
    - Audio
    - Image
    - Text
    - Video
  - Print
  - Electronic media
    - CD-ROM
    - Diskette
    - DVD
- (DC) Extent
  - Collation
    - Pagination
    - Duration

13. **Core element: Target Audience (new)**

Qualifiers for agricultural resources

Policy makers
Planners
Researchers
Research Institutions
Educational institutions
Students
Information intermediaries
Media

Note:

The new proposed core element, Target audience will be further developed to have a standardised list. It is currently under review.

II. Full element description[4]

This part defines each element using a set of 10 attributes recommended by DCMI that conforms to the ISO/IEC 11179 (ISO11179) standards for describing elements. There are 10 attributes of which eight attributes were used for each element. These are ***Name, Label, Definition, Comments, Language, Datatype*** and ***obligation.*** The other 2 namely, ***Version*** and ***Registration Authority*** are applied globally.

The following example show how each of the elements and sub-elements was described.

Example: **Element Title**

Name	Title
Label	Title
Definition	A name given to the resource. Typically, a title will be a name by which the resource is formally known
Datatype	Alphanumeric text
Maximum Occurrence	Not Repeatable
Language	English
Obligation	Optional
Comments	

5.0 Conclusions and Future developments

A. Implementation aspects compared to generic Dublin Core

Suggestions and comments were received from all partners of the Agricultural Metadata Standards Initiative, as well as from Stuart Weibel, Executive Director of the Dublin Core Metadata Initiative. These led to the following implementation decisions with respect to the generic specification of Dublin Core:

- Merged the DC elements ***Creator, Contributor and Publisher*** to one main element called ***Creator;***
- Dropped the element ***Source,*** but elaborated the element ***Relation*** to include information about the source;
- Proposed a new element called **TARGET AUDIENCE**;
- Proposed new qualifiers and attributes that are vital to the description and discovery of information in the agricultural domain.
- Proposed creation of ***Authority files*** for elements and qualifiers that have secondary information that is not included in the metadata description of a resource but is relevant for resource discovery.

The proposed metadata set for describing information resources in the domain of agriculture contain 13 elements, namely, *Creator, Title, Rights, Identifier, Relation, Description, Subject, Coverage, Date, Type, Format, Target Audience.*

[4] Full description of all elements is presented at: http://www.fao.org/agris/MagazineArchive/MetaData/ElementFinal.doc.

B. Future developments

As mentioned earlier, this paper only represents the first step in the development of tools to aid resource discovery in the agricultural domain. The initiative will be posted and advertised in agricultural forums so as to impact the targeted audience. Work is still in progress and the logical frameworks that have been developed are in the process of being converted into technical frameworks. The proposal will also be presented to the intergovernmental process of FAO for possible endorsement by member countries.

Some of the immediate future developments are as follows:

- To encode and publish the Application Profile both as an XML Document Type Definition as well as an RDF Schema;
- To initiate a pilot project between FAO and a number of important and successful agricultural gateway services. The project aims to provide a single access point with multi-host searching using the Agricultural Application Profile as the standard for linking common metadata across the different gateway services;
- To develop software tools in support of the proposed standard (e.g. for import, export, validation, query purposes, etc.);
- To register the metadata framework and specific application profile with authoritative metadata registries.
- To develop guidelines for the application profile to assist implementers and users.
- To monitor the impact of the proposed metadata application profile for agricultural resources, making any changes or enhancements based on the results of the impact study, and undertaking outreach work to promote and facilitate the rational and widespread use of metadata

References

1. Dublin Core Qualifiers. http://www.dublincore.org/documents/2000/07/11/dcmes-qualifiers/
2. Dublin Core Metadata Element Set, Version 1.1, Reference description. http://www.dublincore.org/documents/1999/07/02/dces/
3. DMCI Type vocabulary. http://dublincore.org/documents/dcmi-type-vocabulary/
4. Food and Agricultural Organization (FAO) Cataloguing and Indexing Manual.
5. Resource Description Framework (RDF) Model and Syntax Specification. http://www.w3.org/TR/REC-rdf-syntax/
6. Metadata: standards for Retrieving WWW Documents (and Other Digitized and Non-Digitized Resources). http://www.stsci.edu/stsci/meetings/lisa3/ruschfejad.html
7. Interoperability Metadata Standard for Electronic Thesis and Dissertations- Version .03. http://ndltd.org/standards/metadata/current.html
8. Using Dublin Core. http://dublincore.org/documents/2001/04/12/usageguide/
9. Discovering Online Resources across the Humanities: A Practical Implementation of the Dublin Core. http://ahds.ac.uk/public/metadata/discovery.html
10. Dublin Core Metadata and the Cataloguing Rules. American Library Association, Committee on Cataloguing: Task Force on Metadata and the Cataloguing Rules (Final Report). http://www.ala.org/alcts/organization/ccs/ccda/tf-tei5.html.
11. The open Archives Initiative: Building a low-barrier interoperability framework. http://www.openarchives.org/documents/oai.pdf