Metadata Lifecycle Model and Metadata Interoperability

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Content

- Background Information
- The Metadata Lifecycle Model
- The Metadata Interoperability
The Background Information of Developing Metadata Lifecycle Model

MAAT and the NDAP: Organization Chart

Organization Chart of NDAP

MAAT: Metadata Architecture and Application Team

NDAP: National Digital Archives Program (Taiwan)

Institutional Projects of Major content holders:
- Academia Historica
- Academia Sinica
- National Central Library
- National Museum of History
- National Museum of Natural Science
- National Palace Museum
- National Taiwan University
- Taiwan Historica

Program Office:
- Content Development Division
- Research & Development of Technology Division
- Applications & Services Division
- Training & Promotion Division
- Operations Management Division

Coordination, Technical Support:
- Thematic Working Groups
- Digital content and digital technology

Technical Support Group:
- Metadata Architecture and Application Team
- Sustainable Content Architecture
- Legal Issues Review of Digital Archives
- Catalog

Non-solicited Projects:
- 21 for digital content development;
- 19 for technology R&D;
- 18 for applications of digital archives;
- 17 for capacity building of digital archives.
Objectives of MAAT

• **Service**
  – Collection Projects (80+ by 2004)
  – Strategic planning and application of metadata standards
  – Metadata application profiles/best practices
  – Metadata consultant services

• **Research**
  – Metadata methodology
    • Metadata Lifecycle Model
    • Domain Analysis
    • Metadata registry
  – Knowledge organization
    • Domain ontology
    • Thesaurus
    • Authority Control
Layers of Knowledge Management for Metadata in the NDAP

**Community**
- Museum, Archives, Library, Herbarium, etc.

**Data Type**
- Rubbings, Files, Rare Books, Full Text, Specimens,
- Corpus, Maps, Photos, Painting and Calligraphy,
- Audio-Visual, Score, Dress, Reports, Investigation, etc.

**Discipline**
- Arts History, Politics, Humanities, Archeology,
- Ethnology, Diplomacy, Zoology, Botany, Genomics,
- Linguistics, Geology, Geography, etc.

**Functionality**
- Resource Discovery, Description, Exhibition,
- Preservation, Rights Management for e-Commerce,
- e-Learning, etc.
Standards Used

- CDWA
- VRA Core
- EAD
- TEI Lite
- Species 2000
- HISPID
- Darwin Core
- CSDGM (FGDC)
- ADL Gazetteer
- OLAC
- ECHO – an FRBR-based profile
- MARC21
- LOM
- DC - All projects

The importance of MLM

- The NDAP faces issues of
  - A diversity on communities, disciplines, data types, and functions simultaneously.
  - The limitation of metadata practitioners.
- The MLM (Metadata Lifecycle Model) is developed as a systematic approach for various projects to achieve:
  - Cost-effectiveness
  - Quality assurance
  - Consistency
  - Interoperability
Step 1
Acquisition of Metadata Base Needs

- INTERVIEW
  - Acquire preliminary information and contacts
    - Contact window, scope, legacy system…
  - Establish a better understanding among the team work
    - Goal, schedule…
Step 2
Review of Relevant Metadata Standards and Projects

• REVIEW
  – Identification of potential metadata standards
    • The four-layer for metadata selection
  – Current metadata trends and issues
    • (Example) Biodiversity - GBIF, TDWG, BioCASE, Species 2000
  – Examination of use cases and their experiences

The Four Layers and Exemplar for Selection of Metadata Standards

Types of Standards

Borrowed from: David Bearman’s WIGSAD Matrix (1989)

Step 3
Investigation of Deep Metadata Needs

- **IDENTIFICATION**
  - A concept of content analysis is deployed.
  - A set of work documents
Model of the levels of arrangement of a fonds
A Case of the NDAP

12 archival collection projects
4-8 levels
- 2 projects
- 1 project
- 2 projects
- 2 projects

Association Diagram
Step 4
Identification of Strategies for the Metadata Schemes and Interoperability Mechanism

- One size can not fit for all.
- The concept of metadata “application profile”
  - Adopting one or several existing metadata standards
  - (Example) Rare book : MARC21 + EAD + TEI Lite
Step 5
Preparation of the Metadata Requirement Specification

- A common agreement / bridge among collection project participants, metadata specialists, and system designers.
- The content includes:
  - Background information of the project
  - Objectives and scope of the metadata system
  - Statement of adopted metadata standards
  - Metadata elements and structure
  - Attributes of metadata elements
  - Input template and related standards crosswalking
  - Functional requirements
  - XML DTD

Step 6
Evaluation of Metadata Systems

- EVALUATION
  - Assessment of potential metadata systems
  - As a reference for
    - Revision of metadata requirements
    - Outsourcing
    - System design, or
    - Collaboration of system development
Step 7
Preparation of Best Practice Guidance

- To ensure the quality control of the metadata records in the collection project
- The content includes:
  - Element name
  - Definition
  - Description rules
  - System suggestion
  - Examples
  - Mapping to relevant standards

Step 8
Development of the Metadata System

- Approaches include:
  - Metadata Requirement Specification (MRS)
    - Develop metadata systems according to the final version of MRS that are agreed between collection project team and metadata team
    - The case is usually happened in the situation that the collection project well understands/expresses their own requirements
  - Prototyping
    - Develop metadata systems according to both the draft of MRS and the direct interactive communication between collection project team and system development team
    - This case is usually happened in the situation that the collection project only have rough/unclear ideas about their own requirements
Step 9
Maintenance of Metadata Service

• Guarantee the quality assurance of metadata mechanisms
• The service model

![Diagram of metadata service relationships]

Step 10
Evaluation of Metadata Performance

• ASSESSMENT
  – The whole metadata process and performance.
  – The content includes to evaluate:
    • Metadata record quality
    • Effectiveness of adopting a metadata scheme for retrieval
    • Use of metadata creation tools within the collection project
    • How well each stage of the metadata lifecycle model has been performed
Interoperability Strategy

1. **Generic**
   - Dublin Core

   - For the public, serve as a base for cross-domain interoperability

2. **Domain-specific**
   - CDWA, EAD, LOM, TEI Lite...etc.

   - For a discipline-oriented, professional, in-depth, and precise search

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Interoperability Strategy

- **Generic**
  - NDAP Union Catalogue

- **Thematic**
  - Thematic or Institutional Union Catalogue

- **Institutional**
  - Individual Project Repository

**Domain-specific**

CDWA, EAD, LOM, TEI Lite...etc.
Union Catalogue of NDAP²

Union Catalogue of NDAP³
Union Catalogue of NDAP

Interoperability Strategy Metadata Registry

Note1: M-multiple ; 1-single
Note2: 「」 linkage element
Interoperability Strategy

Metadata Registry

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1. Agency (Ex: Getty Institution - National Palace Museum)
   - Agency
   - Search

2. Encoding Scheme (Ex: Value list)
   - Encoding Scheme
   - Search

3. Element Set (Ex: CIDOC, EAD)
   - Element Set
   - Search

4. Application Profile (Ex: NPM Digital Archive Project, Academia Historica Government Archive)
   - Application Profile
   - Search

Catalogue Interface

Metadata Interoperability Layers in the NDAP

<table>
<thead>
<tr>
<th>ICT</th>
<th>XML, OAI-PMH, Web Services, et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic</td>
<td>Metadata Stds. Crosswalking, MDRs, Application Profile</td>
</tr>
<tr>
<td>Culture</td>
<td>Cross Institutions, Domains and Communities</td>
</tr>
</tbody>
</table>
Complexity of Metadata Landscape in NDAP

Ongoing and Future Work

- Knowledge Organization System
  - Thesaurus development
  - Ontology (Conceptual Model)
    - IFLA FRBR (Functional Requirement of Bibliographical Record)
    - CIDOC CRM (Conceptual Reference Model)
    - OAIS Reference Model
Selected Publication¹


Selected Publication²

Thanks for your attention, and welcome any comments.