ARIADNE Project

• ARIADNE (Advanced Research Infrastructure for Archaeological Dataset Networking in Europe)

• FP7-INFRASTRUCTURES-2012-1 EU project (Grant agreement no: 313193)

• Primary goals
  • To integrate existing archaeological research infrastructures
  • To enable the use of distributed datasets and services
  • To develop new and powerful technologies as an integral component of the archaeological research methodology
ARIADNE Project

- CIDOC-CRM chosen to implement integration
- Mapping activities already started within the project
- To convert data and try to build integrated scenarios
- ARIADNE Year 1:
  - Content providers supported by FORTH Crete, PIN and CNR
  - MiBAC, the Italian Ministry of Cultural Heritage and Tourism
- Mapping the **Italian national standards** for the encoding of archaeological information (developed and maintained by ICCD) to CIDOC-CRM
ICCD and the Italian CH Documentation

• Central Institute for Catalogue and Documentation

• One of the 7 central institutes of the Italian Ministry of Cultural Heritage (MiBAC)

• Main goal: to create a centralized national catalogue of the Italian cultural heritage

  • Research and development of tools, methods and standards for knowledge, protection and enhancement of the Italian cultural and artistic heritage

  • Management of the national general catalogue of archaeological, architectural, historical, artistic and ethno-anthropological heritage

  • Realization of the integration between databases of MiBAC and the ones of the local institutions distributed on the territory
ICCD *Corpus* of Cataloguing Standards (v. 3.00)

- *Regulations for cataloguing*, describing the data models and the Authority files, to be used for cataloguing activities
- *Catalogue schemas*: descriptive *models* and *forms* for collecting information in a structured way, according to a “path of knowledge”
- *Authority files*, a complete control system to guarantee uniformity in the use of information concerning key concepts used throughout the whole system
  - ICCD created and maintains 3 authority files for *archaeology*: “AUT” (Authors), “DSC” (Archaeological Excavations), “RCG” (Archaeological Surveys)
- *Support and control tools*: *thesauri* and *terminological tools* developed to perform data acquisition operation in a uniform way
ICCD Models for Archaeology

- Data Models for the cataloguing of **movable** and **immovable properties**
  - Paper forms
  - Digital Archives (SIGEC, SIGECWeb)
- **SI Schema - Archaeological Sites**: to document archaeological sites, intended as a “portion of land that preserves evidence of human activities”
- **SAS Schema - Stratigraphic Surveys**: to document stratigraphic sequences found in contexts of archaeological excavations
- **CA Schema - Archaeological Complexes**, to document archaeological properties having a functional architecture easily identifiable, composed of various building units
- **MA Schema - Archaeological Monuments**: to document archaeological properties consisting of a single identifiable building unit identified and organized on functional basis
ICCD Models for Archaeology

- **RA Schema - Archaeological Finds**: to document movable objects
  - Most used and well established standard for Italian archaeology
  - Very high number of artefacts, already available and continually increasing as a result of archaeological activities throughout the national territory

- **NU Schema - Numismatics**: to document of all the objects mainly having a monetary relevance

- **TMA Schema - Archaeological Materials**: to record large collections of materials without significant characteristics

- **AT Schema - Anthropological Finds**: to document biological evidences in close relation with archaeological and paleontological, historical and cultural contexts

- **EP Schema - Epigraphic Documents**: to record the various aspects of the epigraphic documentation
ICCD Models for Archaeology
ICCD RA Mapping to CIDOC-CRM

• The RA schema: “Reperto Archeologico” (Archaeological Artifact)
• Physical objects purposely created by human activity
• Provides huge amount of information for the description of archaeological objects, (ca. 300 fields and subfields; ca. 20 sections)
• Different object types (Vocabularies)
• Relationships: internal and with other archaeological entities
• The “cross-sections”, also present in other schemas: a good base for the prosecution of the mapping activities
• Mapped on CIDOC-CRM E22 Man-made Object
### Scheda

<table>
<thead>
<tr>
<th>CD - CODICI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TSK - Tipo Scheda</td>
<td>RA</td>
</tr>
<tr>
<td>LIR - Livello ricerca</td>
<td>I</td>
</tr>
<tr>
<td>NCT - CODICE UNIVOCO</td>
<td></td>
</tr>
<tr>
<td>NCTR - Codice regione</td>
<td>08</td>
</tr>
<tr>
<td>NCTN - Numero catalogo generale</td>
<td>00487640</td>
</tr>
<tr>
<td>ESC - Ente schedatore</td>
<td>S06</td>
</tr>
<tr>
<td>ECP - Ente competente</td>
<td>S06</td>
</tr>
<tr>
<td>OG - OGGETTO</td>
<td></td>
</tr>
<tr>
<td>OGT - Definizione</td>
<td>opere</td>
</tr>
<tr>
<td>CLS - Classe e produzione</td>
<td>STRUMENTI, UTENSILI E OGGETTI D'USO/CONTENITORI E RECIPIENTI</td>
</tr>
<tr>
<td>LC - LOCALIZZAZIONE GEOGRAFICO-AMMINISTRATIVA</td>
<td></td>
</tr>
<tr>
<td>PVC - Localizzazione geografico-amministrativa attuale</td>
<td></td>
</tr>
<tr>
<td>PVC- - Stato</td>
<td>ITALIA</td>
</tr>
<tr>
<td>PVCR - Regione</td>
<td>Emilia Romagna</td>
</tr>
<tr>
<td>PVER - Provincia</td>
<td>BO</td>
</tr>
<tr>
<td>PVCZ - Comune</td>
<td>Mazziolino</td>
</tr>
<tr>
<td>LDC - COLLOCAZIONE SPECIFICA</td>
<td></td>
</tr>
<tr>
<td>LDCT - Tipologia</td>
<td>museo nazionale</td>
</tr>
<tr>
<td>LDON - Denominazione</td>
<td>Museo Nazionale Etrusco &quot;Pompeo Aria&quot;</td>
</tr>
<tr>
<td>LDCU - Denominazione spazio viabilistico</td>
<td>Via Ponrienta Sud, 13</td>
</tr>
<tr>
<td>LDCS - Specifiche</td>
<td>Sala IV, vetrina 16</td>
</tr>
<tr>
<td>UB - DATI PATRIMONIALI</td>
<td></td>
</tr>
<tr>
<td>INV - INVENTARIO DI MUSEO O SOPRINTENDENZA</td>
<td></td>
</tr>
</tbody>
</table>

|  |  |  |
| INV - Numero | 1487 |
| INVD - Data | 1969 |
| STI - STIMA |  |
| STIS - Stima | L. 20000 |
| STID - Data stima | 1969 |

#### RES - LOCALITA' DI RIFERIMENTO

| DSG - DATI DI SCAVO |  |
| SCAN - Denominazione dello scavo | Sasso Marconi, Via Ponrienta 225/9 |
| DSAG - Ente responsabile scientifico | G. V. Gentili |
| DSCT - Motivo | opera privata |
| DSID - Data | 1969 |
| DSGS - Numero tomba | T1 |
| DSCH - Specifiche | G. V. Gentili, "La recente scoperta di due tombe etrusche a Sasso Marconi (Bologna)", in Studi Etruschi XXXVIII (1970), pp. 241-245 |

#### DT - CRONOLOGIA

| DTZ - CRONOLOGIA GENERICA |  |
| DTZO - Fase cronologica di riferimento | secolo V a.C. |
| DTFZ - Frazione cronologica | terzo quarto |
| DTM - Motivazione cronologica | contesto |
| DTM - Motivazione cronologica | analisi tipologica |

#### MT - DATI TECNICI

| MTC - Materiale e tecnica | bronzo, laminatura, fusione |
| MIS - MISURE |  |
| MSU - Unità | cm |
| MISA - Altezza | 18,4 |
| MISD - Diametro | 8,8 |
| MISE - Spessore | 0,3 |

#### DA - DATANANALITICO

| DES - DESCRIZIONE |  |
| DESEO - Indicazioni sull'oggetto | Blocco rotondo, leggero estroflesso, brevissimo collo tronconico, corpo globulare senza soluzione di continuità con il fondo convesso, area eromentante con attacco a motivo vegetale stilizzato, imposta dal ventre all'interno dell'urlo, a sec. rettangolare |

#### CO - CONSERVAZIONE

| STC - STATO DI CONSERVAZIONE |  |
RA Model: The “Codes” Section (CD)

- ICCD general identifiers
- Local institutions identifiers

<table>
<thead>
<tr>
<th>CD</th>
<th>CODICI</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>NCTR</td>
<td>Codice regione (Regional Code)</td>
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<tr>
<td>NCTN</td>
<td>Numero catalogo generale (General Catalog Number)</td>
<td></td>
</tr>
<tr>
<td>NCTS</td>
<td>Suffisso numero catalogo generale (General Catalog Number Suffix)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INV</th>
<th>INVENTARIO DI MUSEO O SOPRINTENDENZA</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVN</td>
<td>Numero Inventario (Inventory Number)</td>
<td></td>
</tr>
</tbody>
</table>

URI: http://www.culturaitalia.beniculturali.it/object/NCTR-NCTN-NCTS
Es: http://www.culturaitalia.beniculturali.it/object/08-00487640-0200
RA Model: Object Features (OG, SGT)

- **Object Definition (OGTD)**: functional and morphological aspect expressed according to the tradition of the studies
- **Specific Object Typology (OGTT)**: specific class to which the object pertains
- **Production Class (CLS)**: category, class or type of production to which the object belongs
- **Object Subject (SGTI)**: the subject or scene represented by the object (only for objects that represent themselves an iconographic subject)

ICCD specific vocabularies
RA Model: Locations and Places (LC, LA)

• **Specific sections** (LC and LA) for the description of the various locations related with the recorded object

• Terminology for location definition
  • UNI-ISO 3166-1 standard (alphabetical list of country names)
  • Standard lists of terms for the Italian administrative areas provided by ISTAT (the Italian Institute for Statistics)

• GeoNames URIs to unique identification and to enhance interoperability

• **Section LC: Current location**, a set of fields providing identification of the geographic and administrative where the artefact was located at the moment of the ICCD record creation
RA Model: Locations and Places (LC, LA)

- **Section LA**: Other locations (i.e. different from the Current Location)
- **TCL field** *(Location Type)*
  - 3 values *(Provenance, Finding, Production)*
  - Determines the meaning of the fields in the LA section and the mapping to be followed
- **Provenance places**
  - Provides information on the object’s previous places of conservation
  - **Repeatable fields**: reconstruction of the object’s location history, i.e. the sequence of all the places in which it was present through time
- **Production place**: set of fields describing the place (if known) where the object was created
- **Finding place**: place where the artifact was found, typically during an archaeological excavation or a survey
RA Model: Finding Event (RE)

TCL: Type = "Finding"

Archaeological Object
E22 Man-made Object

P24B changed ownership through

OBJECT FINDING
E8 Acquisition

P117 occurs during

DSC, DSCS: Finding Place
E53 Place

P14 carried out by

P32 used general technique

P17 was motivated by

Excavation/Survey
E7 Activity

P7 took place at

P57 is identified by

P1 is identified by

[Open Vocabulary]
"Stratigraphic"
"Open Area"
...

SCAN: Excavation Name
E41 Appellation

DSCM, RCGM: Method
E55 Type

[Open Vocabulary]
"Rescue Archaeology"
"Photo Interpretation"
...

P17 has time-span

DSCD RCGD: Excavation Date
E52 Time Span

NCUN, DSCI: Identifiers
E42 Identifier

DSC Authority File

NCUN: Codice univoco ICCD
RCG: Modalità di reperimento
RCG: Modalità di ricerca
RCG: Ente responsabile
RCG: Responsabile scientifico
RCG: Data
RCG: Motivo
RCG: Metodo
RCG: Unità stratigrafica
RCG: Numero tomba
RCG: Numero inventario di scavo

DATI DI SCAVO

NCUN: Codice univoco ICCD
SCAN: Denominazione dello scavo
DSC: Ente responsabile
DSCA: Responsabile scientifico
DSCT: Motivo
DSCD: Data
DSCU: Unità stratigrafica
DSCS: Numero tomba
DSCI: Numero inventario di scavo
RA Model: Acquisition (ACQ)

Archaeological Object
E22 Man-made Object

New Owner
E39 Actor

Current Owner
E39 Actor

Former Owner
E39 Actor

Acquisition
E10 Transfer of Custody

ACQD
E52 Time Span

ACQL
E53 Place

ACQN
E82 Actor Appellation

ACQT
E55 Type

P131 is identified by
P22 transferred title to
P52 has current owner
P23 transferred title from
P9 has time span
P7 took place at

[Open Vocabulary]:
"Purchase"
"Donation"
"Auction Adjudication"
...
RA Model: Other sections

- Visual documentation
  - Images, Videos, Sketches
  - E38 Image, E36 Visual Item
- Bibliography (P70 is documented in -> E31 Document)
- Data rights and accessibility conditions (E30 Rights held by E39 Actor)
- Other notes and comments (P3 has note - > E62 String)
- Administrative information (Record creator, Record creation date etc.) -> not considered for the mapping
- Conservation and restoration information -> to be addressed ...
Data Conversion and Publication

- Early stage: conceptual mapping
- Conversion of data encoded with the RA model in a CIDOC-CRM RDF format
- Performed in various ways, (mapping and exporting tools)
- Exporting features provided by SIGECWeb
  - Able to export information concerning entities, cross-references and internal relationships, in various ways (XML, Excel)
  - ICCD “exporting package”: a set of directories containing textual data descriptions and multimedia files; very easy to convert into RDF
- New facilities SIGECWeb for the direct CIDOC-CRM RDF exporting and the direct publication of semantic information as Linked Open Data
- MiBAC online infrastructure:
  - RDF frameworks for hosting and management of semantic information
  - SKOS and Linked Open Data facilities for the semantic web implementation
Conclusions

• **Mapping of RA model:** the beginning of a wide activity that will be carried out within the ARIADNE project

• Mapping work has demonstrated an extremely **high compatibility** of RA with CIDOC-CRM

• Mapping of other ICCD models (**MA model** for archaeological monuments – PIN + MiBAC)

• ICCD is releasing version 4.00 of **Corpus:** more rational (event based)

• CIDOC-CRM **archaeological extension:** in progress (ARIADNE project)

• Other mapping experiences within ARIADNE: English Heritage, ADS, DANS, FASTI Online

• **ARIADNE Infrastructure** for integration and interoperability: triple store and LOD framework