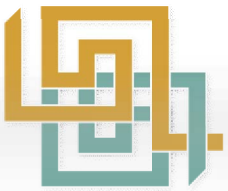
Interoperability

Holly Wright

ARIADNE is funded by the European Commission's Seventh Framework Programme

Overview

- Why do we care about interoperability? Isn't it enough to just make our data available for re-use?
- Once you go through all the hard work of preserving and disseminating your data, a whole world opens up!
- By combining your data with the data of others in new ways, we can create new knowledge and understanding that was not possible before.

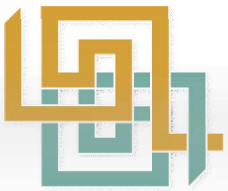


Overview

- Metadata
- Controlled vocabularies, thesauri or ontologies
- Geo-Data
- Linked Open Data
- Portals

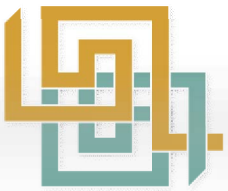
Metadata

- Metadata sits at the heart of interoperability. Without good metadata, interoperability isn't possible.
- Metadata should, whenever possible be based on standards
- It often takes some time and research to determine what the appropriate standards are for your metadata
- Very often the metadata created for a project, may not conform to a standard, and mapping has to take place. This isn't a bad thing, but if metadata is already standards compliant (all or in part), its much less work!



Mapping

- Use of standards-based ontologies, thesauri and controlled vocabularies can help your data become interoperable.
- The most widely used ontology in Cultural Heritage is the CIDOC CRM, which is an ISO standard.
- Not specific to any one domain, so no terminology or relationships are presented that are specific to archaeology.
- Extensions have been developed like the CRM-EH and CRMarcheo

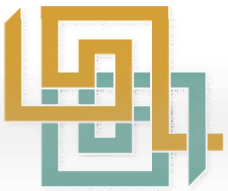


Mapping

- Working with ontologies can require a lot of work and expert knowledge, which may or may not be necessary
- Using thesauri; lists of agreed upon terms with simple, hierarchical relationships is often all that is needed
- Even using controlled vocabularies, where you just map to a list of terms can be an easy path to interoperability
- Example is the SENESCHAL project, which brought together archaeology vocabularies and thesauri used by the national agencies for England, Scotland and Wales, which can now be used as standards

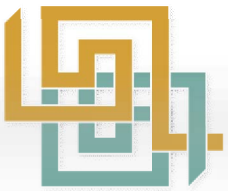
Mapping

- ARIADNE is using the CIDOC CRM and experimenting with the new CRMarchaeo, but for archaeological subjects has chosen to map to the Getty Art & Architecture Thesaurus (AAT) as a central spine
- Perceived as the most ‘neutral’ by most European partners
- Mappings are made in the partner’s native language (and English if desired)
- This means you can search for a subject in Hungarian, and get results in German (English is just the glue)



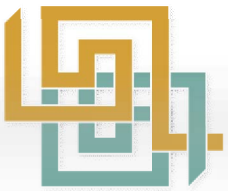
Geo data

- Lots of work has been done with making archaeological data interoperable with regard to place
- One of the best examples is the Pelagios project
  - Links online resources to the historic past, primarily within the classical world, meant to be primarily machine readable
  - New initiative called Peripleo, which provides a map interface



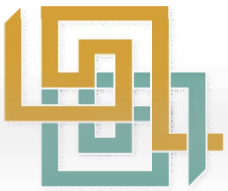
Temporal Data

- Most of the work has been done on what and where, as its (relatively) easy
- By far the most difficult aspect of making archaeological data interoperable is dealing with WHEN
- When is always dependent on where (bronze age is different depending on where you are in the world
- CRMarchaeo has tried to deal with this using a concept called ‘space-time’ volumes
- PeriodO is using ‘assertions’ to build consensus around temporal terms



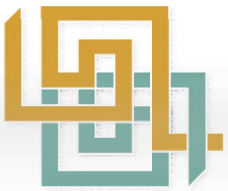
Different Approaches

- Some approaches for making data interoperable use a top-down approach
  - Using a controlled vocabulary to which everyone agrees to map their data
  - Mapping to an ontology like the CIDOC CRM
- Some approaches for making data interoperable use a bottom-up approach
  - Using a variety of sources showing where an archaeological place is mentioned in a text to create a research resource
  - Using the assertions used by different people in different place to build up assertions about archaeological time periods



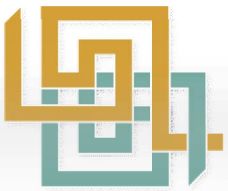
Linked Open Data

- Most of what underlies all of the examples shown is based on technologies and concepts that use Linked Data, preferable Linked Open Data (LOD)
- Linked Data is a very different way of organising data
- Rather than using relational tables found in most traditional databases, it uses a graph data structure, which has no hierarchy.



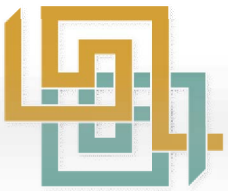
Linked Open Data

- Everything is built using a subject-predicate-object relationship that can linked in any direction, pulled apart and recombined in any direction.
- It allows the use of inference to leap across concepts.
- We even use it as important part of our CMS.



Portals

- Interoperable data can be brought together and searched from a single interface, often a portal. This is known as a federated query.
- One of the earliest examples of portal was part of the ARENA2 project.
- Most of the previous examples are portals, using data from a variety of sources which has been made interoperable.



Acknowledgements

ARIADNE is a project funded by the European Commission under the Community's Seventh Framework Programme, contract no. FP7-INFRASTRUCTURES-2012-1-313193.