D 12.6 – Final Testing Report

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Executive Summary

This document is a deliverable (D12.6 *Final Testing Report*) of the ARIADNE project ("Advanced Research Infrastructure for Archaeological Dataset Networking in Europe"), which is funded under the European Community's Seventh Framework Programme. D12.6 is associated with Task 12.4 *Testing* within WP12, which is titled *Implementing Interoperability*, and falls within the larger ARIADNE conceptual framework for the ARIADNE e-Infrastructure. It is an extension of D12.4 *Initial infrastructure testing report*, and reports the outcomes of the final acceptance testing, taking on board the outcomes of the initial testing. This deliverable was also used to inform Tasks 12.3 *Implementing* integration and 12.4 *Testing*, to facilitate fine tuning of the infrastructure before completion of the project.

As outlined in D12.3 one of the goals of the ARIADNE infrastructure is to integrate data and metadata from different providers across Europe into one common schema, and also to provide semantic integration along different axes (e.g. subject, space, time). This integration intends to provide useful and user-friendly information services for archaeology. The services are intended to be available not only to researchers and related stakeholders, but also to a wider range of potential users requiring access to collections and datasets.

It was this user-centred approach that was adopted for the testing of the infrastructure and is reported here. The testing comprised a survey of content-providing partners and formal testing methods. Each strand aimed to balance the requirements set out in D12.1 with the services designed and implemented in D12.2 and D12.3. Following on from the recommendations and results of D12.4 (which are addressed below) this document tests the infrastructure using broader methodologies including the application of usability heuristics and the System Usability Scale (SUS). This document reports on the results of an online survey of content-providing partners and indicates that while there was a general level of satisfaction with the infrastructure there are a number of areas in which improvements would likely benefit the opening out of the infrastructure to an even broader audience, particularly in relation to user-friendliness and help documentation.

Results of D12.6 testing are presented according to the methods used with further subdivisions according to the services tested. Comments and further recommendations are provided in each section.

It must be noted that some of the comments provided in the survey do not concern the implementation level required by the project Grant Agreement or the requirements set out in the infrastructure initial design. Such comments rather concern features that could improve the system usability and effectiveness, and will be taken into account in the next version. As discussed in the conclusions, there is space for improvement in future versions, not unexpectedly for a complex and novel system as the ARIADNE one.

1 Introduction and Objectives

This document is a deliverable (D12.6 *Final Testing Report*) of the ARIADNE project ("Advanced Research Infrastructure for Archaeological Dataset Networking in Europe"), which is funded under the European Community's Seventh Framework Programme. D12.6 is associated with Task 12.4 *Testing* within WP12, which is titled *Implementing Interoperability*, and falls within the larger ARIADNE conceptual framework for the ARIADNE e-Infrastructure. It is an extension of D12.4 *Initial infrastructure testing report*, and reports the outcomes of the final acceptance testing, taking on board the outcomes of the initial testing. This deliverable was also used to inform Tasks 12.3 *Implementing integration* and 12.4 *Testing*, to facilitate fine tuning of the infrastructure before completion of the project.

The objectives of work package 12 are:

- To adapt infrastructures provided to ARIADNE for integration.
- To design and set up the necessary tools (crosswalks, mappings) and resources for interoperability.
- To set up the internal (APIs) and external (human) interfaces to access the integrated resource.

Work Package 12 is comprised of the following tasks:

- 12.1 Use requirements
- 12.2 Design and Specifications
- 12.3 Implementing Integration
- 12.4 Testing

Task 12.4 tested the integrated infrastructure built in Task 12.3 *Implementing Integration*, based on the requirements and design specified in Task 12.1 *Use Requirements* and 12.2 *Infrastructure Design*. Infrastructural elements with user interfaces were tested for this task.

Documented in D12.2, the ARIADNE Registry is a key element of the interoperability framework and drives resource discovery within the public-facing ARIADNE portal. In particular, the deposit service allows registered users to deposit data and metadata descriptions following the ARIADNE Dataset Catalogue Model (ACDM) schema. The provided metadata is managed through a Digital Assets Management service, and is presented to the public through the ARIADNE portal. The Resource Discovery Services (mainly indexing and retrieval) enables access to data resources and integrated viewing of data resource descriptions, through the portal. The vocabulary management service is responsible for maintaining a list of SKOSified vocabularies and thesauri. The metadata enhancement

service allows for automatic enhancement of metadata found in ACDM records. These enhancements include the mining of relations, and automatic linking with thesauri and vocabularies etc. [D12.2, 10]

In summary the architecture provides:

1. the functionalities of the ARIADNE Catalogue;
2. interoperability and integration functionalities for archaeological resources;
3. the platform upon which the ARIADNE services will run. [D12.2, 11]

This report is focused on testing each component of the ARIADNE infrastructure to ensure that each module is compatible and contributes to the integrated system. The methods used to test the ARIADNE integrated infrastructure were varied and included group meetings relating to portal testing, communication by e-mail/skype with individual partners about implementing the recommendations of D12.4, an online survey of content-providing partners as well as in-house testing using formal usability methods. This report also outlines the current workflows in place for providing content for integration into the ARIADNE infrastructure.

2 Use Requirements, Service Design and Implementation

The work of WP12 specified use requirements for the ARIADNE infrastructure (noting the extensive work of WP2 on user needs and WP3 on the Registry), to design and implement a specification for the infrastructure based on the use requirements. Use requirements specified in D12.1 focused on three areas: datasets, metadata standards, schemas and vocabularies and access and sharing policies. The use requirements reflected the data available in the archaeological sector, and priorities for the integration activities for different types of data. Use requirements for the infrastructure have both practical and policy implications, both of which must be reflected in the implementation as appropriate (D12.1, 4-5). The design specification focused on an integration strategy which addressed metadata integration and data integration, and in the first instance, enabled cross-search of resources through What, Where, When and Resource Type facets. Consistency and quality are key requirements for content added to the ARIADNE infrastructure (D12.2, 16-17).

D12.4 provided a comparison of the use requirements of D12.1, the service design of D12.2 and its implementation in D12.3. It also offered preliminary testing of the various interfaces of the infrastructure which were available at the time. This document provides further testing of the infrastructure via several methods which incorporate aspects of the general use requirements of D12.1 with additional testing using formal methods.

3 Infrastructure Design

3.1 Infrastructure Elements

The integrated infrastructure incorporates the ARIADNE registry, aggregation and validation services (MORe) as well as the ARIADNE portal. These combined elements enabled archaeological and cultural heritage content in various forms to be made available to researchers, chiefly through their integration in the online web portal. Although the portal is crucial to discovering, visualising and accessing archaeological data, even more crucial is the quality of the metadata submitted to the infrastructure by ARIADNE partners. This is born out in community feedback and concerns articulated in D2.1 and across other disciplines and infrastructures (see for example metadata principles in the *Framework of guidance for building good digital collections* of the National Information Standard Organisation). D2.1 reported that 50% of archaeological researchers felt that metadata quality was 'very important' while a further 34% felt it was 'rather important'. The infrastructure sought to mitigate metadata quality issues by validating deposited data against the ACDM schema, thus ensuring a minimum standard which could be used for integration. The enrichment services aim to further improve metadata quality by allowing automatic enhancement of ACDM records. To continue to ensure metadata quality the workflow for how the data reaches the portal must be clear and well-defined for future content providers.

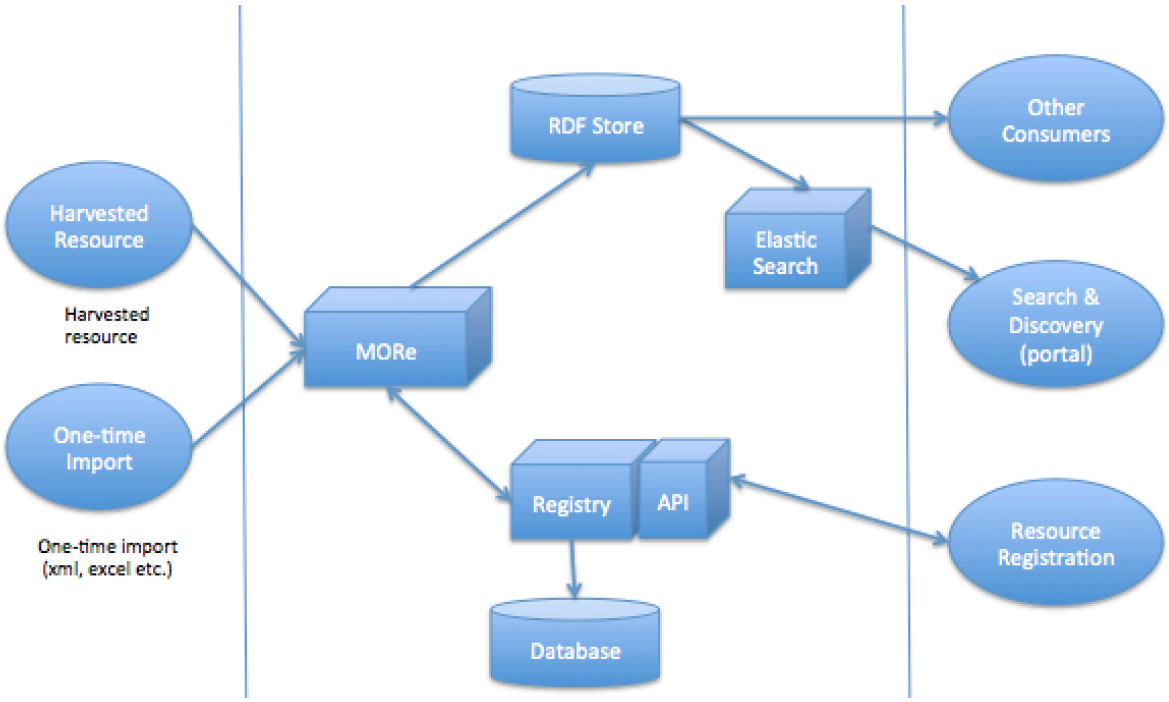

Figure 1. *The ARIADNE data aggregation workflow from D12.3 [p.13]*

3.2 Content Provision Workflow

ARIADNE content-providing partners have different routes for sharing their data in the infrastructure, these are outlined below.

Stage 1: Ingest

The metadata registry provides three different interfaces for managing information:

1. Web based UI. This is designed for manual editing of information by human users. Each content provider has their own user account through which they can add new/edit existing information per class and link different instances together. The use of this tool was extensively documented in D12.4, see pp. 18-33.
2. Batch Import. The batch import is available to partners through contact with technical partners and allows the batch ingest of datasets and collections through: a) OAI-PMH target, b) XML file, c) Excel file. Templates for Excel and XML files are available through the Registry support portal and must be correctly structured for ingest. The Excel file contains all mandatory classes, as well as some recommended classes, and is then sent to technical partners for inclusion in the registry. Similarly, providers can create an XML file for their data, this can be validated against an .xsd file also available in the registry web tool and then sent to technical partners.

3. REST API. The REST API allows users to export all catalogue information (per provider) in XML format and to manipulate it through a REST API. The access to the API is controlled by a session key that is generated from within the Web interface (per provider). REST API can be used to return, edit, add and delete records in the ARIADNE Catalogue. The authentication required to perform these tasks is provided through the ARIADNE Catalogue, using API keys for the machine interface and user/password challenge on the human interface (D12.2, 34).

Stage 2: Validation, enrichment and publication

The MORe aggregation workflow has been proven through experience in LoCloud, CARARE and other European projects. MORe provides a flexible architecture, and is used here to aggregate content in various formats, and from a variety of sources, to the RDF store, the registry and Elasticsearch. MORe incorporates a micro-service oriented architecture supporting the following core services (D12.3, 13):

- Input
- Validation
- Transformation
- Enrichment
- Publication

The tool has a user-friendly interface for metadata ingest, validation and enrichment. The workflow for the tool is well designed, as the user is guided through the steps necessary for completing the publication of metadata to the portal by a virtual assistant. An illustrated workflow is given in Annex II.

After validation and enrichment, data is then published to the web portal for search and discovery as well as integrated viewing of data resource descriptions.

4 Usability & Testing

4.1 Results of D12.4

The initial testing of the infrastructure was reported in D12.4, the result of which was a list of specific recommendations which were circulated to relevant partners. Upon consulting with technical partners it was agreed that the web tool component of the registry would not be developed further owing to its limited use by content providers. It was recommended, however, that should the tool be used more frequently in the future by new content providers, the recommendations of D12.4 relating to the service should be addressed and incorporated into the web interface. The recommendations related to other aspects of the infrastructure are listed below, with the addition of a comments field indicating the current status of the recommendation. These comments were informed by recent testing of the infrastructure as well as partner feedback from the survey conducted for this deliverable. It must be observed that many of the issues evidenced concern future new users, and thus will need to be considered when planning a new release of the system, where content provision would be enlarged to a much wider audience.

		Recommendations	Comments
	3	**12.1 Requirements**	
R31	3.1.1	Resolve the use of language around the terms 'Registry' and 'Catalogue' in any support documentation and user interfaces.	To be addressed in future versions for new content providers. Current users are clear about the equivalence of the two terms.
R32	3.1.1	Clarification of the use requirements for the Preview Service.	Clarified: Preview service will not contain a preview of data but will provide a preview of metadata in the form of search results in the portal.

		Recommendations	Comments
R33	3.1.2	Appropriate, targeted guidance for the user in the use of the Registry to add data resources is required.	To be addressed in future versions. Although there is user documentation available, there should be one single section on the portal interface which allows users to determine how they might deposit data, including basic workflow, ingest formats and contact details for partners responsible for this.
R34	3.1.2	A business and sustainability model is required.	Ongoing: This is being examined as part of the sustainability plan.
R35	3.1.3	Guidance for users on the nature of the errors encountered during the deposit and ingest process would be helpful.	Partially resolved, and to be completely addressed in future versions. There are no further developments conceived for the Registry tool. Errors manifested through other deposit/ingest processes (e.g. Excel, XML) are communicated to providers directly by technical partners. The MORe tool has robust error notifications.
R36	3.1.3	A word cloud of the 'derived subject' facet or Getty AAT terms, either as a filter or a second word cloud in the 'What' browsing area.	Resolved: This has been resolved by WP13 and the word cloud is now populated with Getty AAT terms. However, this leads to weighting in favour of those datasets which have been successfully enriched by Getty AAT terms, and is perhaps not fully representative of the entirety of the data in the catalogue.
R37	3.1.4	The project should communicate clearly to users its approach to data and metadata.	Resolved: While some users were uncertain as to whether data was to be ingested at item or collection level, partners are clear that the catalogue contains metadata with external links to data. Experiments for data integration at item level are ongoing and are taking place within alternative metadata repositories (CNR-ISTI). These will be implemented in a separate experimental section of the portal interface.

		Recommendations	Comments
R38	3.1.5	The source vocabularies available through the Vocabulary matching tool could be expanded to allow broader mapping to AAT.	Resolved: Currently the vocabulary matching tool contains vocabularies from British providers. As the tool is offered as a partner service (as opposed to one developed specifically within ARIADNE) it is not practicable to expand the source vocabularies, in addition most partners have mapped native vocabularies to the Getty AAT as part of WP15.
R39	3.1.5	Guidance documentation on how to prepare vocabularies for inclusion in the tool and for mapping would be required.	Resolved: Partners communicated directly with WP15 partners and mapped vocabularies are available through MORe for enrichment of provider data.
R40	3.2.1	Documentation is required for the PeriodO enrichment service.	Resolved: The PeriodO enrichment is in being implemented in MORe.
R41	3.2.5	Clarify, from D12.1 and D12.2, what kind of integration and interoperability is sought for scientific datasets.	Resolved: This aspect is being addressed by WP16 where data mining is ongoing for dendrochronological data.
	5	**Aggregation services**	
R42		Documentation for the use of MORe should be available within the Support Portal and accessible from within MORe.	Postponed. Some partners expressed confusion about the role of MORe in the workflow. In future versions there will need to be clear guidelines on partner access to MORe.
R43		Include worked examples of provision of the Collection class in user guidance, including metadata provision for the items or data resources of which the collection is composed, would illustrate for users how their content will be represented in the portal.	Postponed. Several survey respondents proposed that further examples be provided in the user guidance in future versions.

		Recommendations	Comments
R44		Further testing should be carried out with a panel of users who do not have previous experience of MORe and associated tools.	Resolved: See internal testing section of this document.
R45		Manual entry workflow in the Registry should be harmonised with user guidance and the latest version of the ACDM.	Resolved: No further development of the tool in the near future. This may change if it is used more frequently. A walk-through video of the tool may be useful for future first time users.
	6	**Support Portal**	
R46		User guidance should include examples of all data resource classes worked with their language resource associations.	Postponed to future versions. See D12.4 pp38-9.
R47		Expand the Registry FAQ.	Postponed to future versions. Questions in the Registry FAQ are quite specific, more general questions should be added, page needs to be re-structured to include sections for ease-of-use.
R48		Change navigation around adding an instance of foaf:agent from within a data resource. (See recommendation under 'Add Dataset' 4.1.3 above).	Postponed to future versions. Even though this tool has ceased active development, this feature should be addressed in the future as a potentially significant usability issue for new users.
R49		Comprehensive step-by step workflow and mapping guidance could be provided both in one resource and broken into parts which reflect various user interactions with the infrastructure.	Postponed to future versions. This was remarked on by only one respondent of the online survey. They noted that the support portal needs 'to be edited for users not familiar with the ARIADNE project, and with their ease of use in mind', such as potential new contributors the ARIADNE registry envisaged in the future.

Table 1 List of Recommendations from D12.4 Initial infrastructure testing report.

4.2 Testing Methodologies

There are several methodologies for testing infrastructural systems like the ARIADNE registry and portal. D12.4 outlined further methods for testing, including the implementation of the System Usability Scale (SUS) in the testing of the registry (D12.4 , 40). This is one of the most common methods for usability and is discussed in detail below.

Other usability methods include **inspection** and **test** methods (see table 2). **Inspection methods** are carried out by system creators and do not use end users as part of the testing process. The methods included under this type are heuristic evaluation, cognitive walkthrough and action analysis. The second type; known as **test methods,** involve the use of end users in the testing phase and also encompasses three strands, thinking aloud, field observation and questionnaires (Holzinger , 2005).

Inspection methods seek to improve interface usability by checking design against established standards (Holzinger, 72). Studies have shown that inspection methods often find many issues that are overlooked by testing with real users, and likewise user testing illustrated problems that were missed in inspection methods, therefore the most beneficial course is to test using a combination of inspection and user test methods (Nielsen (1994a), 413).

Inspection methods	**Test methods**
Heuristic evaluation	Thinking Aloud
Cognitive Walkthrough	Field Observation
Action Analysis	Questionnaires

Table 2 Usability Evaluation Techniques

It is commonly agreed that there are five essential usability characteristics: learnability, efficiency, memorability, low error rate and satisfaction. The performance of a system relative to these characteristics ensures the system will be successful to end users. Jakob Nielsen extended usability principles and outlined ten "heuristics" or principles which user interfaces should comply with, see below (Nielsen, 1994b, 25-62).

For the purposes of testing the ARIADNE integrated infrastructure, a combination of methods was used. From the inspection methods tier, heuristic evaluation was used as the most time-efficient method, while from the test methods tier, a questionnaire in the form of an online survey was conducted.

Heuristic evaluation

"*Heuristic evaluation is a usability engineering method for finding the usability problems in a user interface design so that they can be attended to as part of an iterative design process*" (Nielsen, 1994b, 25-6).

In this inspection method, a usability tester carries out several run-throughs of the system interface and tests them against a set of defined principles. The most commonly used set are the 'heuristics' of Jakob Nielsen which set out ten standards against which systems should be tested. Nielsen's heuristics were used for testing the interface of the ARIADNE integrated infrastructure. Heuristic evaluation is a cost and time effective method for testing and has been noted to have a low "intimidation barrier" to its implementation (Nielsen, 1994b, 25).

4.3 Internal Testing

4.3.1 Methodology

Each individual evaluator inspects the interface alone. After evaluations have been completed, findings can be aggregated, but prior to this, there is no collaboration between evaluators in order to ensure independent conclusions (Nielsen, 1994b 26). As the registry was deemed to have too steep a learning curve in this testing phase, only users familiar with the tool assessed this aspect. A better indication of user experience with the registry can be gauged from the survey questionnaire circulated to content-providing partners (see below).

4.3.2 Testing

A group of internal testers tested the infrastructure individually, as they were familiar with the overall aims of the ARIADNE project and experienced in both content provision and utilisation of the tools. Each user was given a form outlining the usability principles and asked to give them a rating (• Poor/•• Moderate/••• Good). The testers were also asked to provide comments on aspects of the infrastructure that addressed, or didn't address, the usability principle in question.

Feedback from testers was amalgamated and relevant comments provided below. As usual, they concern improvements to be implented in future versions. Table 3 shows the usability principle with corresponding description.

Visibility of system status	The system should always keep users informed about what is going on, through appropriate feedback within reasonable time
Match between system and the real world	The system should speak the user's language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
User control and freedom	Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
Consistency and standards	Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Error prevention	Even better than good error messages is a careful design which prevents a problem from occurring in the first place.
Recognition rather than recall	Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
Flexibility and efficiency of use	Accelerators- unseen by the novice user- may often speed up the interaction for the expert user to such an extent that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
Aesthetic and minimalist design	Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
Help users recognize, diagnose, and recover from errors	Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
Help and documentation	Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

Table 3 Usability heuristics as outlined by Nielsen. [Source: J. Nielsen,

'Heuristic Evaluation' ***Usability inspection methods 17.1 (1994) p.30.***

ARIADNE Registry Tool

Ratings: • *Needing improvement/*•• *Satisfactory/* ••• *Good*

Usability feature	Rating	Comments
Visibility of system status	•	It was sometimes unclear when data had been successfully ingested into the registry. It is recommended that in future versions users are given feedback on successful or unsuccessful actions in the tool. It is difficult to determine where in the process one is, whether the system is saving progress and the status for data input at organisation level (multiple separate accounts for individuals in one organisation, without flags of other content or visibility across accounts.)

Match between system and the real world	••	Some help texts could be improved to allow information 'appear in a natural and logical order'.
User control and freedom	••	There are adequate exit points for users, however there is scope to support undo and redo.
Consistency and standards	••	For the most part the tool followed the wording and structure of the ACDM which led to a standard method of expression, however, it is necessary to point users to the ACDM specification should they need to check their metadata against the model. This could be in the form of a link to the description of the ACDM class, property or attribute in the specification.
Error prevention	••	There were few experiences of direct errors in the tool, for specific examples see D12.4, p.22. Requiring values in certain fields reduces the likelihood of errors occurring in later stages of the data ingestion process.
Recognition rather than recall	••	Options and actions are visible to the user in the tool with the same interface for each resource to be added which facilitates user recognition.
Flexibility and efficiency of use	•	Both expert and novice users interact in the same way, there is only one interface for all users. There is no possibility to tailor frequent actions.
Aesthetic and minimalist design	••	Although the user interface is minimalist, it may benefit from a clearer visual structure. Seven of the available resource types are not visible on this page, including the mandatory foaf:agent. Key data resource classes could be grouped together, and language resources grouped separately, reflecting the resource types. A basic visualisation may help the user to better understand the relationships between data resources and language resources, and illustrate which language resources are mandatory or recommended for particular data resources.
Help users recognize, diagnose, and recover from errors	••	There were no experiences of coded error messages, however, the lack of feedback once datasets have been added and saved creates uncertainty about whether resources have been successfully added. A pop-up message indicated that resource has been successfully saved/ingested would be useful.
Help and documentation	••	There is a help section on the Registry but this could be expanded. It is important to include a way of contacting partners for technical support. However, when technical support was required response was swift and efficient.

Aggregation Service, Validation Services, Metadata Enrichment Services: the MORe aggregation tool

Ratings: • *Needing improvement/*•• *Satisfactory/* ••• *Good*

Usability feature	**Rating**	**Comments**
Visibility of system status	•••	The tool has very good feedback mechanisms. Users receive alerts each time there has been a change in the status of a package (ingestion, validation, enrichment etc.)
Match between system and the real world	•••	The tool is simple to use. A virtual guide takes users through the system with simple pop-up instructions once each stage has been completed. Language and concepts are plain and easily understandable to non-technical users.
User control and freedom	•••	Supports undo: Packages can be easily rejected or deleted at any stage prior to and after publication. There are clear exit paths for users at all stages when using the tool.
Consistency and standards	••	Language used in the tool is uniform throughout. However, there is some need to update the support documentation in the micro-services section which currently points to LoCloud support.
Error prevention	•••	There was no experience of direct errors in the tool.
Recognition rather than recall	•••	The tool has a very clear visual structure with each component accessible from the main interface. Objects, actions and options are visible at all times and remain so from one part of the dialogue to another.
Flexibility and efficiency of use	•••	Frequent actions can be tailored by the ability to build an enrichment plan for data, this can be re-used for newly ingested data.
Aesthetic and minimalist design	•••	The tool has a very clear interface design.
Help users recognize, diagnose, and recover from errors	•••	Messages are easy to understand for non-technical users. Validation errors are clearly indicated, with users able to get details for the records and elements that are causing the errors. A notification log from previous actions can also be accessed in the tool.
Help and documentation	••	While there is support documentation available within the MORe tool, this is for the LoCloud project. This documentation should tailored for and be made available for the ARIADNE instance of the tool, or at least be described on the ARIADNE website.

Portal[1]

Usability feature	Rating	Comments
Visibility of system status	●●●	It is easy to see where you are in a search, as the facets chosen which lead to current views are displayed on screen beside the search results.
Match between system and the real world	●●●	There are no system-orientated terms and the portal follows real-world conventions. It may be necessary to re-structure and re-write the descriptions on the support page for non-technical users. For example it is not immediately clear why the ACDM is described here. It would be more useful to have a guide to the portal, rather than information about the registry. Archaeologists' several paths to data and information are well reflected in the portal. Extensive efforts in integrating archaeological vocabularies and existing information structures ensure a good match between real world archaeology and the system.
User control and freedom	●●●	It is easy for users to refine their search parameters using the filters, these facets can be added or removed with ease, thus supporting undo and redo. A link to the search page to begin again is always available.
Consistency and standards	●●	Information display is clear and consistent. While ARIADNE has a strong data standard, ensuring adherence to the standard across partners from different contexts is key to consistency across archaeological data in the portal. There may be some confusion among users in the number of facets related to thematic concepts-in particular the presence of three similar refinements- subject, keyword and original subject. It should be made clear that

[1] Note the portal has also been tested together with the services in WP13, readers are urged to also consult WP13 deliverables.

		'subject' relates to the Getty AAT term, while the other facets (from the native metadata) may benefit from a help text to point users to where these terms originate (i.e. with depositors).
Error prevention	●●●	The portal always returns search results rather than producing error messages. It is also clear when there are no results to display for a given search.
Recognition rather than recall	●●●	The resource landing pages and search pages display buttons for relevant options in a uniform way. However, no general 'help' button is visible within the portal.
Flexibility and efficiency of use	●●	Use of faceted searching may increase efficiency of use for experienced users. Options to save shortcuts for frequent actions are not available. It would be worth exploring the addition of a login so that users can create an account in the portal and save or export their search results.
Aesthetic and minimalist design	●●●	The portal very successfully shares sufficient relevant information and options without crowding the search or landing pages. Some of the rolling images on the landing page of the portal may need to be reviewed as there needs to be a high contrast between the search and browse boxes and the background images. Some images are too 'busy' and need to be a higher resolution, file sizes should be reviewed as occasionally certain images take longer to load than others.
Help users recognize, diagnose, and recover from errors	●●	There were very few experiences of errors in the portal. The function for viewing a record's metadata in ACDM XML is not currently functioning.
Help and documentation	●●	Help and documentation is not easily visible or accessible within the Portal. The ARIADNE Portal Guide PDF document is a clear and effective guide which should be accessible from the portal 'about' section, rather than the project website.

4.4 Online Survey

A survey was conducted among content-providing partners to the ARIADNE infrastructure. This was done through an online survey tool (SurveyMonkey) and the link circulated to all partners through basecamp. There was a good response rate from content-providing partners, with about 65% of partners completing the survey. The questionnaire implements a usability technique from the second tier of Table 2, balancing the heuristic evaluation used above.

The main impetus behind the survey was to test the integrated features and workflows of the ARIADNE infrastructure. As such it posed questions on the registry, enrichment services and the portal, with a focus on content preparation, ingest and publication. There was also significant examination of the help/support documentation available to users. How integrated the overall architecture is will be essential for the future integrity of the ARIADNE project. The survey provided multiple opportunities for partners to expand on their answers or comment on aspects of the infrastructure which they felt were not highlighted in the survey itself.

The survey results are presented here based on the various sections of the infrastructure which were evaluated. The results of the survey were communicated to the technical partners for review and analysis, and for eventual integration into the infrastructure. This is an ongoing process as more content is ingested and the infrastructure is refined.

A copy of the survey questions is available in Annex I. Within the survey there was an embedded usability testing mechanism called the System Usability Scale (SUS).

4.4.1 System Usability Scale (SUS)

The System Usability Scale (SUS) was created by John Brooke in 1986 and is designed to provide the following benefits:

- Is a very easy scale to administer to participants
- It can be used on small sample sizes with reliable results
- Is valid- it can effectively differentiate between usable and unusable systems

The SUS must be understood in terms of the limitations of usability as a tangible quality and must be viewed ‘in terms of the context in which it is used, and the appropriateness to that context.’ It is, as Brooke outlined, ‘impossible to specify the usability of a system… without first defining who are the intended users of the system, the tasks those users will perform with it, and the characteristics of the physical, organisational and social environment in

which it will be used.'[2] (Brooke, 1996) It has been found to be highly reliable and useful across a range of interface types (Bangor, Kortum and Miller, 2008).

The SUS is simple ten-point scale which aims to give a global view of subjective assessments of usability. It was born of the need to replace hitherto complicated evaluation methods which were time-consuming, expensive and frustrating for users. The ten statements that comprise the SUS are designed to cover a variety of different aspects including the need for support, training and complexity and therefore 'have a high level of face validity for measuring usability of a system.'

SUS statements:

1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to sue
4. I think that I would need the support of the technical person to be able to use this system
5. I found the various functions in this system were well integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use this system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

Respondents are asked to rate each of the above statements on a five point scale ranging from **strongly disagree** (1) to **strongly agree** (5).

SUS Scoring

SUS scores are calculated by totally the score contributions from each statement, each statement's score ranges from 0-4. For statements 1, 3, 5, 7 and 9 the score is the rating given by the respondent -1. For statements 2, 4, 6, 8 and 10 the score is 5 – the rating given by the respondent. The total of all the scores multiplied by 2.5 gives the overall system usability value. This ranges from 0 to 100.

The average SUS score is 68, scores above this are considered 'above average'. The score ranges from 0 (negative) to 100 (positive). However, the SUS score is not a percentage. In addition to the scoring Bangor, Kortum and Miller have developed an adjective rating scale to provide more meaningful and helpful results. These are shown in the chart below.

[2] These aspects have been addressed in the course of the ARIADNE project by several strands, in particular by the work of WP2 and the resulting D2.1 First Report on user's needs.

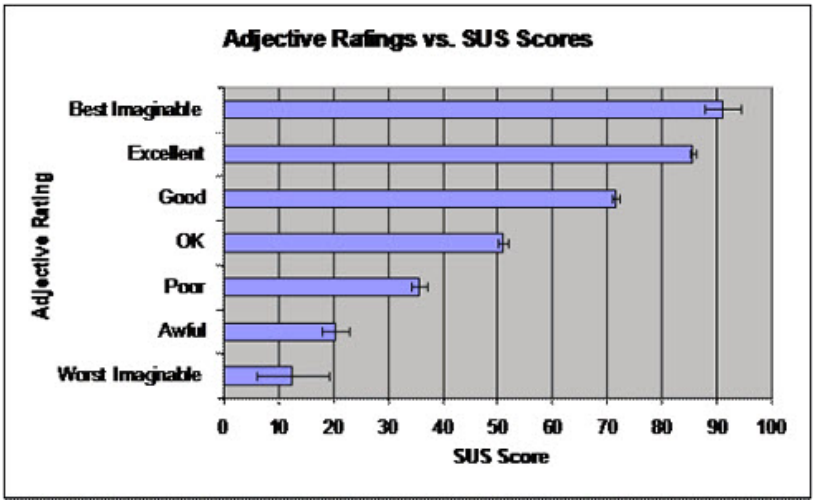

Figure 2. *Mean SUS score ratings corresponding to the seven adjective ratings (error bars +/- one standard error of the mean). From Bangor, Kortum and Miller, 'Determining what individual SUS scores mean: adding an adjective rating scale' in Journal of Usability Studies, 4:3 (2009)*

SUS testing was carried out through the Task 12.4 survey for the registry and portal; results are given below.

Registry

Results for the registry varied somewhat from partner to partner (see comments below). The lowest SUS score was 37.5 with the highest being 75. On average the SUS score was 58.75, below what is considered average. It gives an adjective rating of 'Ok'.

Portal

The portal had considerably higher scoring than the Registry. The SUS scores for the portal ranged from 42.5 (from one partner, the next lowest score being 65) to 90 indicating a higher level of satisfaction among partners. The average SUS score being 77.5, well above the average. This gives an adjective rating of 'good'.

Comments: While the results indicate that there is general satisfaction with how the infrastructure performs, there was in each respondent's case a lower level of satisfaction with the registry than there was with the portal. This is perhaps a false dichotomy as the registry contains the data powering the content that appears in the portal. It is likely that the lower score more fully represents some difficulties experienced with adapting native content to the ARIADNE infrastructure which often involved varied technical considerations on the best method for mapping, ingesting and exposing provider's databases to the project. During system development, uploading content to the registry was sometimes cumbersome as it happens in early development stages, while these difficulties substantially decreased when the system was fully operational. Possibly, the memory of the problems encountered

during this initial development stage inconsciously influenced some answers in the negative, especially with non-technical partners. The ingestion activity was carried out at a partner-to-partner level and in the initial stages involved an iterative process whereby the infrastructure was being developed as different (and sometimes unforeseen) types of content was being offered by partners. This (largely undocumented) work is a key consideration for future collaboration within ARIADNE and the publication of case studies for how native data repositories were exposed to the infrastructure may be useful for future users.

An important aspect of the responses is the difference of experience from partners who had large infrastructural resources at their disposal and those who had smaller operations and fewer technical staff. This is a critical factor to consider when assessing the way the consortium will operate in the future. Should larger partners share resources (training, workshops, technical services etc.) or should these partners act as conduits for content provision by smaller providers? Alternatively, should the infrastructure be adapted to ensure that smaller institutions with fewer resources are catered for by improving the overall accessibility to relevant documentation and technical support?

4.4.2 Survey Results

The five areas defined as important for archaeological research data highlighted by D2.1 were:

- **Data transparency**: having a good overview of available datasets
- **Data accessibility**: the required datasets are available in an uncomplicated way
- **Metadata quality**: the available datasets are well described
- **Data quality**: the available datasets are complete and well organised
- **International dimension**: having easy access to international datasets

These areas were assessed in the course of the online survey conducted for WP12 testing. Respondents were asked to rate how they felt different aspects of the infrastructure addressed the key five areas.

The Registry

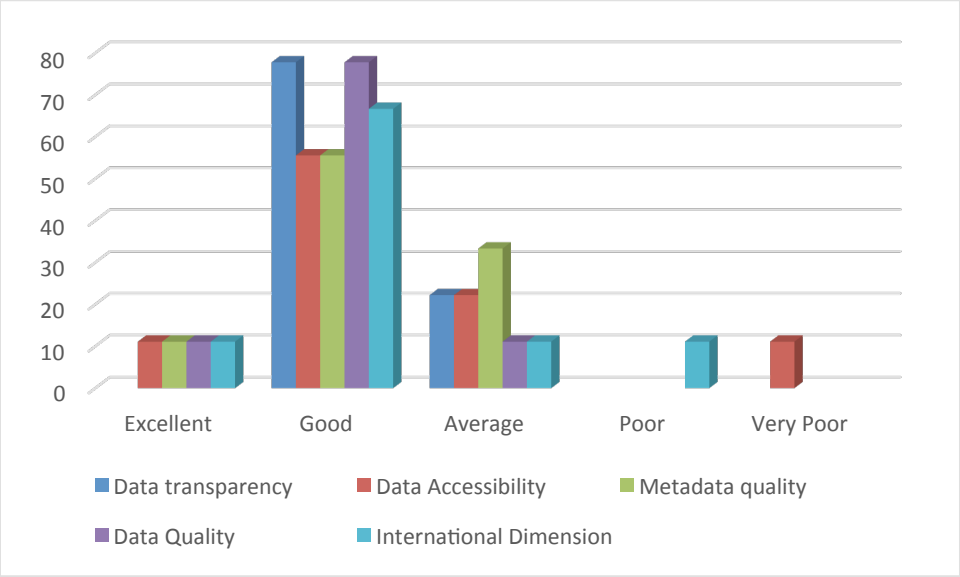

Figure 3. *Chart showing the level of satisfaction with the registry in relation to the general use requirements of the ARIADNE infrastructure*

The Portal

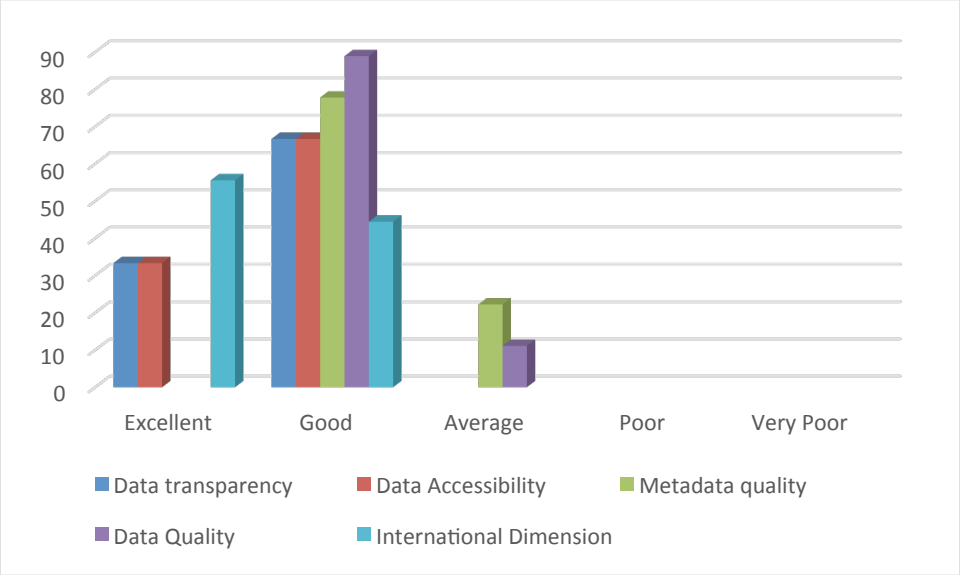

Figure 4. *Chart showing the level of satisfaction with the portal in relation to the general use requirements of the ARIADNE infrastructure*

Comments: The feedback from respondents in relation to the general use requirements of the ARIADNE infrastructure reflects the results of the SUS scores. A higher level of satisfaction with the portal indicates that there are needs to be a more user-friendly, documented workflow for data ingest to the registry. Some responses indicate that depositors desired a higher level of user control over the ingest process so that data would appear according to provider's needs in the portal. It is important to recognize that the portal represents the final stage of the data ingestion workflow and as such is more likely to reflect satisfaction compared with earlier stages of content provision, which may have involved technical and infrastructural issues to be overcome, and is in general less rewarding in terms of "seeing the results of work done".

Additional survey themes

The online survey also sought to understand the level of satisfaction with other aspects of the infrastructure including how familiar partners were with other features of the infrastructure, how their data was ingested into the infrastructure and their level of satisfaction with the process from ingest to publication.

The ARIADNE Catalogue Data Model (ACDM)

ARIADNE Catalogue Data Model is an extension of the Data Catalog Vocabulary (DCAT), a quasi-recommendation of the W3C Consortium that "is well-suited to representing government data catalogues such as Data.gov and data.gov.uk". The reason for adopting the DCAT Vocabulary (apart from re-use) is that DCAT is proposed as a tool for publishing datasets as Open Data. Its adoption places therefore ARIADNE in an ideal position for publishing datasets as Open Data as well (see http://portal.ariadne-infrastructure.eu/about).

Respondents were asked about their level of familiarity with the ACDM as well as how necessary they felt a knowledge of the ACDM was for the provision of content to ARIADNE.

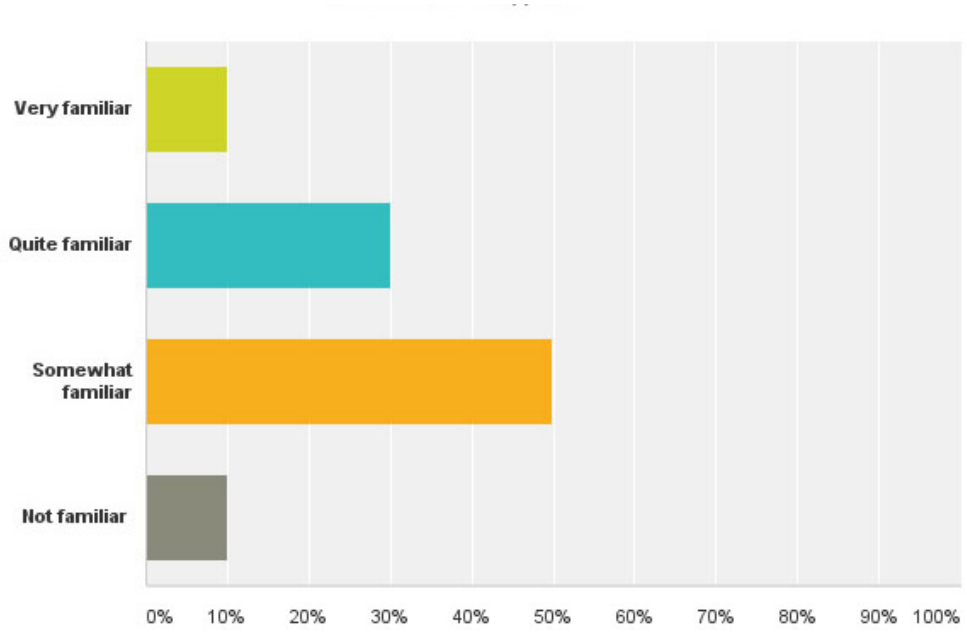

Figure 5. *Chart showing responses to the question 'How familiar are you with the ACDM?'*

The majority of respondents were familiar with the ACDM, the largest number (50%) considered themselves 'somewhat familiar'. Respondents were further asked about how necessary they felt a knowledge of the ACDM was for ingesting data, with all respondents considering it either necessary (70%) or partially necessary (30%). 60% of respondents felt that there was insufficient training and resources available for using the ACDM within ARIADNE, while the remainder felt that there were sufficient resources. Several recommendations from partners on how this might be achieved were suggested, these are grouped according to similarity below:

- '…Publishing worked examples of application…. I think more examples are necessary…. Adding more examples of mapping. Using a mapping tool that shows the preview of the mapping results…… By adding tutorials and example files (e.g. spreadsheet or xml file)…… A guide listing and describing each ACDM concept (as it is some are missing)…….'

- '….make it easier to find the most current information/help/tutorials ....The Help link in the registry should be linking to the support portal http://support.ariadne-infrastructure.eu/. Within the support portal, there is a heading titled 'Mapping Guidelines' but what follows aren't Mapping Guidelines', but rather the many iterations of the Specification of the ARIADNE Catalogue Data Model. The actual mapping guidance is buried at the end of the section and called the DataResources user guide. This whole page and the documents within it need will need to be edited for users not familiar with the ARIADNE project, and with their ease of use in mind…..'

Comments: The specification for the ACDM is currently contained in the 'About' section of the portal, [http://portal.ariadne-infrastructure.eu/about] the user guide should be updated with more examples and added to this section. The help section of the registry includes example Excel and XML files. These should be expanded to reflect more varied content and in particular the Excel file should include several more rows of sample data. This is particularly important given that these formats were most commonly used by partners (see below). In addition to this, as highlighted by a user above, the help link in the registry should be linked to the support portal at http://support.ariadne-infrastructure.eu/#intro. The example files should also be included on this interface. In general, however, it must be noted that understanding the ACDM and the required mappings requires substantial technical skills that were not always available for the content provider partners, as those commenting above. Thus it is likely that just adding more examples may not solve the issue, unless accompanied by training of content providers.

Ingesting Data- The ARIADNE registry

This section should be used in order to assess the best methods for future development of the ingest workflow as it reflects the formats best suited for mapping from provider's native data (and presumably the archaeological community at large).

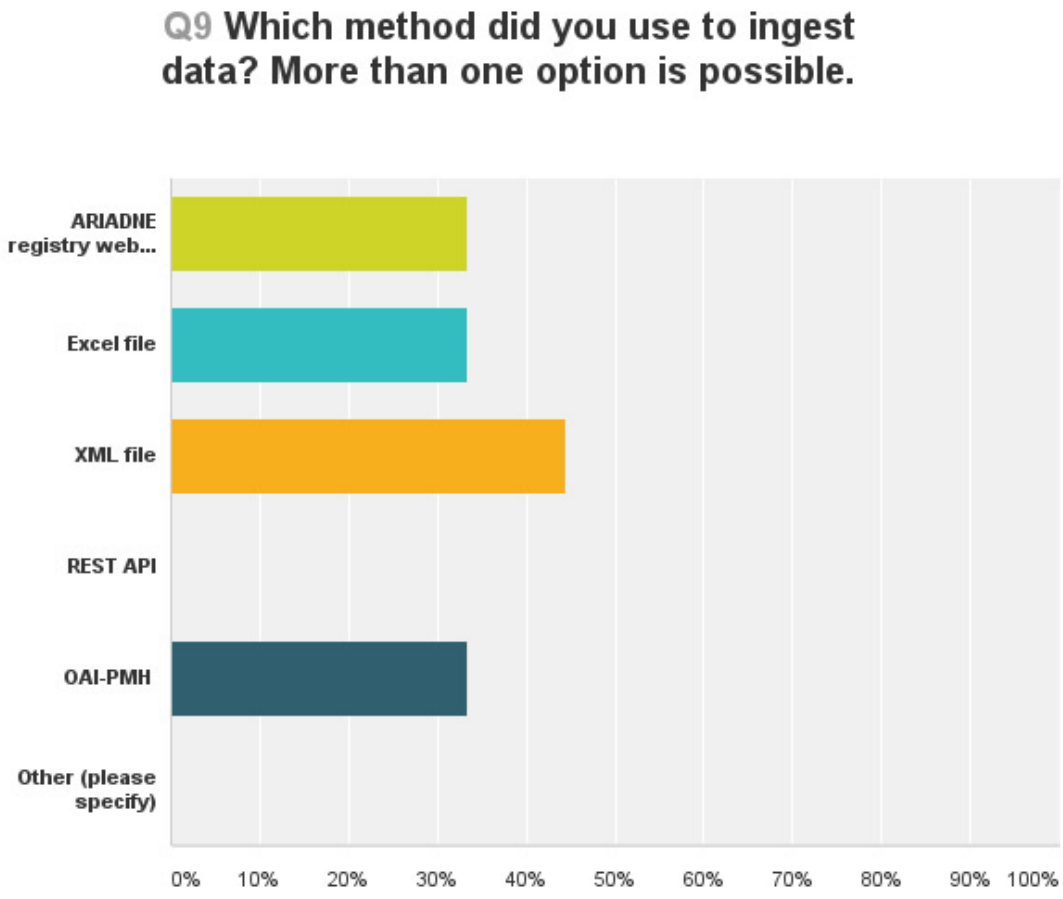

Figure 6. *Chart indicating which methods used by partners to ingest data into the infrastructure. Note that some partners used more than one method.*

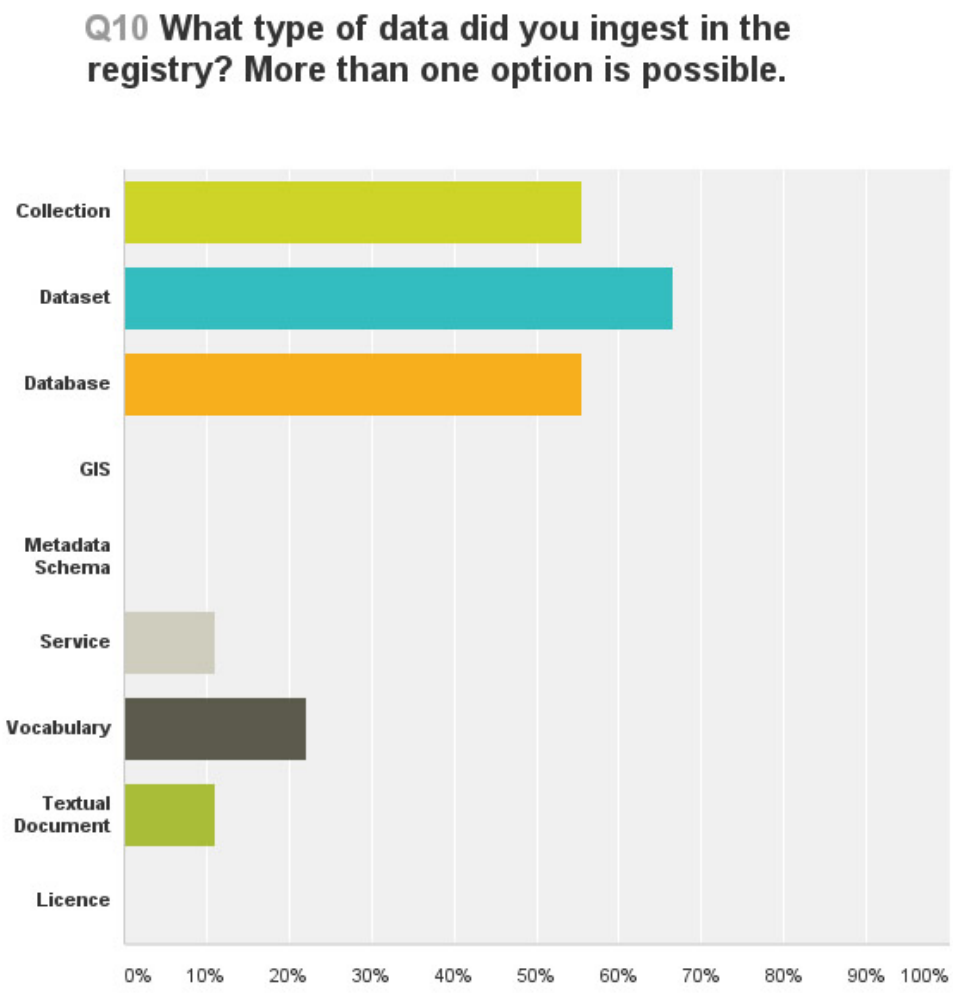

Figure 7. *Chart indicating the type of digital resources ingested to the ARIADNE infrastructure.*

Comments: It should be noted that no partners used the REST API to ingest records. There is technical documentation for the API contained in the Registry help section as well as in D12.3. It may be useful to edit this to provide more suitable documentation for non-technical users, with step by step instructions. Smaller providers without OAI-PMH targets are likely to use the Excel and XML files to ingest data, therefore the comments noted above (about more detailed example files) should be addressed for new users, possibly setting up a training program. It was recommended that a webpage with clear details on how data can be added to the registry is added to the portal (as this will generally be the first point of interaction with the infrastructure). This page should include contact details for technical partners for future collaborators who wish to submit content to the ARIADNE infrastructure.

The type of content ingested is given in Figure 6. Although no respondents reported ingesting GIS data, 40% indicated that they would be likely to ingest GIS data in the future.

Partners were given the opportunity to comment on any issues which they encountered when ingesting data to the registry. Some reported that there were difficulties with aligning/normalising their native data with the requirements of the registry. Two respondents commented on the need for guidance on whether data should be ingested at item or collection level. These difficulties were mainly resolved by contacting the partners responsible for technical support. Respondents indicated a general level of satisfaction with individual technical support, how this support will be maintained in the future should be considered by the consortium at large.

MORe aggregation tool

Only a small number of respondents reported using the MORe aggregation, validation and enrichment tool. Users are directed to read section 4.3.2 which details internal testing carried out on this feature. Of those respondents who used the tool, all were satisfied with the enrichment of their data with only two enrichment services recorded as being used, LoGeo and Thesauri mappings. Therefore, it is recommended in the first instance that these two services, as well as PeriodO, be comprehensively documented in the tool and links updated to refer to ARIADNE documentation rather than LoCloud documentation. Some enrichment micro-services may be imrpoved with more comprehensive descriptions. For a detailed workflow of this tool see Annex II.

Support/Help documentation

There was an overall level of satisfaction with the support documentation with 70% of respondents finding the documentation either helpful or sometimes helpful. The chart below gives details on how respondents felt the documentation could be improved.

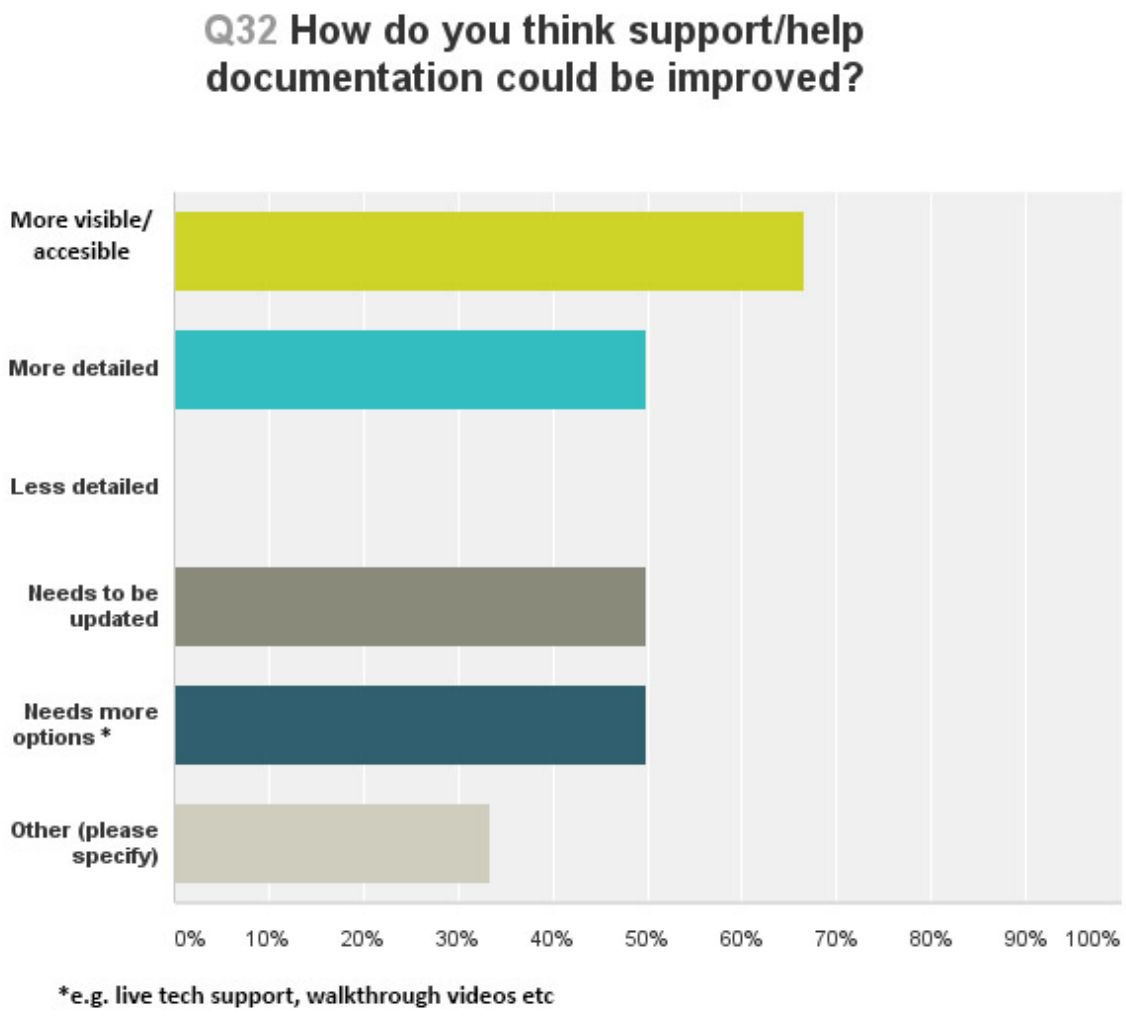

Figure 8. *Chart indicating how the support and help could be improved*

Reiterating what was outlined for the ingest process (see above) respondents commented that example datasets and more mapping examples would improve user experience.

5 Conclusions

5.1 Registry tool testing

Based upon the requests of the user testing in D12.4 the resolution of outstanding issues had been completed in several areas with 50% of issues reaching solution now and 50% of issues postponed to the next version of the system, where future new users will find a friendlier environment. This is particularly the case in the support portal that will need to take into account the characteristics of a new wave of content providers.

Overall the user feedback from the new round of internal testing of the Registry Tool resulted in a satisfactory score with specific improvements to be planned into several areas to improve the usability, including:

- Addition of Undo/Redo function
- Ensure all help texts are present including help links which describe the different properties of the ACDM
- Employ a clearer visual structure for the interface which reinforces grouping of key resourcing classes

Areas where the registration tool could be improved include also:

- Development of a “basic” and “expert/advanced” setting
- Provision the user feedback on the results of their action and error reporting

Based upon the SUS testing average score result of **58.75** the Registry tool would be considered below average so some level of improvement is required in future developments. The already noted fact that the current providers/testers/responders had to pay a price for contributing to a system being developed and tested, with the related frustration and dissatisfaction of availing, at least in the beginning, of a still incomplete system, somehow mitigates this result.

Based upon the online user testing the Registry received predominantly good rating across all the areas of testing including: data transparency, data accessibility, metadata quality, data quality and international dimension.

Based upon the online testing users’ feedback effort should be made to improve the understanding and comprehension of the ACDM as familiarity was relatively low and the provision of training resources should be considered as very important.

5.2 MORe aggregation tool testing

Overall the user feedback from the internal testing of the MORe aggregation tool resulted in a moderate to good score with good marks given to all the testing criteria. Where there is the potential for a slight improvement would be to update support documentation to coordinate tool to reference the ARIADNE project. Based upon the online user feedback the MORe aggregation tool was not being utilized by several project testers and the benefits of its use should be promoted widely, specifically as regards the use of the PeriodO, LoGeo and Thesauri mapping functions.

5.3 Portal testing

Overall the user feedback from the internal testing of the Portal resulted in good score with good marks given to all the testing criteria. The areas highlighted for slight improvement include:

- Ability for users to save and use previous search queries
- Improve error reporting functions and visibility of help and guides

The first feature was not included in the initial specifications of the portal, and will be considered in ARIADNE 2.0. There is always space to improve help, and users' feedback is the best way to understand which aspects need further detail, as they look simple to the developer but are instead difficult for the user, while others treated with great detail are maybe of little relevance for the user.

Based upon the SUS testing average score result of **77.5** the portal the Portal would be considered well above average with an adjective rating of good.

Based upon the online user testing the portal received predominantly good rating across the areas of testing including: metadata quality, data quality and international dimension, and excellent to good ratings for data transparency and data accessibility

6 References

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Selhofer, H., Geser, G., *D2.2: Second Report on Users' Needs*, February 2015, http://www.ariadne-infrastructure.eu/content/view/full/1188

A framework of guidance for building good digital collections (2007)
[http://www.niso.org/publications/rp/framework3.pdf]

7 Annex 1: Online Survey

Q1. Are you affiliated with an ARIADNE participating partner?

Answer Choices	Responses
Yes	92.3%
No	7.7%
Total	13

Q2. What is the name of your organisation?

Responses
Svensk Nationell Datatjänst
Austrian Academy of Sciences
Stuart Eve Consulting
National Institute of Archaeology with Museum at the Bulgarian Academy of Sciences (NIAM-BAS)
ArheoVest Association
Archaeology Data Service
German Archaeological Institute
Hungarian Natioanl Museum
Central Institute for the Union Catalogue of Italian Libraries and Bibliographic Information
ZRC SAZU
Digital Curation Unit, Athena Research Centre
ARUP_CAS_17
Inrap

Q3. What best describes your role?

Answer Choices	*Responses*	*No.*
Archaeologist	76.9%	10
Researcher	69.2%	9
Computer Scientist	0%	0
Software developer	0%	0
Digital Archivist/Records Manager/Information scientist	38.5%	5
Other (please specify) ***"Data Manager"***	7.7%	1

Q4. How familiar are you with the Ariadne Catalogue Dataset Model (ACDM)?

Answer Choices	Responses	No.
Very familiar	10%	1
Quite familiar	30%	3
Somewhat familiar	50%	5
Not familiar	10%	1
Total		**10**

Q5. How necessary do you think a knowledge of the ACDM is when using the Metadata Registry?

Answer Choices	Responses	No.
Necessary	70%	7
Partially necessary	30%	3
Not necessary	0%	0
Total		**10**

Q6. Do you feel that users who are not familiar with the ACDM would be able to ingest material into the registry, as it is currently designed?

Answer Choices	Responses	No.
Yes	20%	2
No	40%	4
Perhaps	40%	4
Total		**10**

Q7. Do you think there is sufficient training and resources (e.g. information/help/tutorials) on using the ACDM within ARIADNE?

Answer Choices	Responses	No.
Yes	40%	4
No	60%	6
Total		**10**

Q8. How could the training and understanding of the ACDM be improved in ARIADNE?

Responses
Make it easier to find the most current information/help/tutorials.
Publishing worked examples of application.
I think more examples are necessary
The Help link in the registry should be linking to the support portal http://support.ariadne-infrastructure.eu/. Within the support portal, there is a heading titled 'Mapping Guidelines' but what follows aren't Mapping Guidelines', but rather the many iterations of the Specification of the ARIADNE Catalogue Data Model.The actual mapping guidance is buried at the end of the section and called the DataResources user guide. This whole page and the documents within it need will need to be edited for users not familiar with the ARIADNE project, and with their ease of use in mind.
For archaeologists, who never done such thing it is difficult to understand and perphaps a step-by-step explanation is needed.
Adding more examples of mapping Using a mapping tool that shows the preview of the mapping results
A guide listing and describing each ACDM concept (as it is some are missing)
By adding tutorials and example files (e.g. spreadsheet or xml file)

Q9. Which method did you use to ingest data? More than one option is possible.

Answer Choices	*Responses*	*No.*
ARIADNE registry web tool (manually)	33.3%	3
Excel file	33.3%	3
XML file	44.4%	4
REST API	0%	0
OAI-PMH	33.3%	3
Other (please specify)	0%	0
Total		**9**

Q10. What type of data did you ingest in the registry? More than one option is possible.

Answer Choices	*Responses*	*No.*
Collection	55.6%	5
Dataset	66.7%	6
Database	55.6%	5
GIS	0%	0
Metadata Schema	0%	0
Service	11.1%	1
Vocabulary	22.2%	2
Textual Document	11.1%	1
License	0%	0
Total		**9**

Q11. What type of data are you likely to ingest in the future?

Answer Choices	*Responses*	*No.*
Collection	66.7%	6
Dataset	66.7%	6
Database	55.6%	5
GIS	44.4%	4
Metadata Schema	11.1%	1
Service	0%	0
Vocabulary	22.2%	2
Textual Document	11.1%	1
License	0%	0
Total		**9**

Q12. Did you ingest data at item or collection level?

Answer Choices	**Responses**	
Item level	22.2%	2
Collection level	33.4%	3
Both	22.2%	2
Not applicable	22.2%	2
Total		**9**

Q13. Did you encounter any problems when ingesting data? Please detail concisely.

Responses
None, ingesting to the registry. Though encountered several problems ingesting to MoRE. There was some confusion as to whether we should ingest at collection or item level, which we feel should have had more guidance on.
As our data was the test data, there were a lot of problems, but this was to be expected. We encountered problems with the size of our files (harvested from the OAI-PMH target) and with mappings (as they had to be done manually by ATHENA). I'm sure these issues were likely resolved by the time other partners were ingesting their data.
We are still working on ingesting data.
In our data the ACDM:subject corresponds to dc:title, in which the values can be one of the following ones: type (eg. Vago con capocchia con ombrellino) or object definition (eg. Fibula) or subject title (eg. Toro Farnese) or the name of the object (eg. Vaso di Baratti) . To normalize these values we had to map dc.title value to the vocalulary AAT and we created a TAG native:subject with the normalized values.
Ingesting at item level needs a non-manual method. Excel is always mentioned as a possibility but it turned out that it was not so. We needed external help (provided within ARIADNE, many thanks to Achille!) to create XML's from Excel. The process was not transparent and there was a lot of back and forth (due to the mistakes in our DB, but ones that are common in most DB's). A more transparent and above all systemic way to ingest Excel is needed since this is the only means that 90% of archaeologists are familiar with. If there is no Excel the ARIADNE portal will be limited to the big institutions with internal computer technicians/scientist support.
Distribution of multiple subjects and keywords; place names have not been useful for geocoding

Q14. Please rate how you feel the registry addresses the general use requirements of the ARIADNE infrastructure:

Answer Choices	Excellent	Good	Average	Poor	Very poor	Total
Data transparency [i.e. does the registry facilitate the aim of having a better overview of available data?]	0% 0	77.8% 7	22.2% 2	0% 0	0% 0	***9***
Data Accessibility [i.e. does the registry facilitate data being available to the user in an uncomplicated way?]	11.1% 1	55.6% 5	22.2% 2	0% 0	11.1% 1	***9***
Metadata Quality [i.e. Does the registry ensure that ingested data is well-described and implements standards for interoperability?]	11.1% 1	55.6% 5	33.3% 3	0% 0	0% 0	***9***
Data Quality (i.e.Does the registry ensure that ingested data is complete and well organised?)	11.1% 1	77.8% 7	11.1% 1	0% 0	0% 0	***9***
International Dimension (Does the registry allow for easy access to international data, e.g. through data integration)	11.1% 1	66.7% 6	11.1% 1	11.1% 1	0% 0	***9***

Q15. How would you rate your overall experience of the ARIADNE metadata registry?

Answer Choices	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
I think that I would like to use the registry frequently.	11.1% 1	11.1% 1	22.2% 2	55.6% 5	0% 0	***9***
I found the registry unnecessarily complex.	22.2% 2	33.3% 3	44.4% 4	0% 0	0% 0	***9***
I thought the registry was easy to use.	0% 0	11.1% 1	55.6% 5	33.3% 3	0% 0	***9***
I think that I would need the support of a technical person to be able to use the registry.	11.1% 1	44.4% 4	33.3% 3	11.1% 1	0% 0	***9***
I found the various functions in the registry were well integrated.	0% 0	0% 0	55.6% 5	44.4% 4	0% 0	***9***
I thought there was too much inconsistency in the registry.	0% 0	44.4% 4	33.3% 3	22.2% 2	0% 0	***9***
I would imagine that most people would learn to use the registry very quickly.	0% 0	22.2% 2	33.3% 3	33.3% 3	11.1% 1	***9***
I found the registry very cumbersome to use.	11.1% 1	44.4% 4	22.2% 2	22.2% 2	0% 0	***9***
I felt very confident using the registry.	11.1% 1	11.1% 1	44.4% 4	33.3% 3	0% 0	***9***
I needed to learn a lot of things before I could get going with the registry.	11.1% 1	11.1% 1	44.4% 4	33.3% 3	0% 0	***9***

Q16. Did you use the ARIADNE metadata registry web tool?

Answer Choices	Responses	No.
Yes	55.6%	5
No	44.4%	4
Total		**9**

Q17. What type of account did you register with in the tool?

Answer Choices	Responses	No.
Individual	33.3%	2
Institution	66.7%	4
Other (please specify)	0%	0
Total		**6**

Q18. Did other individuals from your institution register separately?

Answer Choices	Responses	No.
Yes	16.7%	1
No	83.3%	5
I don't know	0%	0
Total		**6**

Q19. If yes, did this result in difficulties when ingesting data to the registry?

Answer Choices	Responses	No.
Yes	0%	0
No	100%	4
Total		**4**

Q20. Do you feel the registration procedure could be improved?

Answer Choices	Responses	No.
Yes	20%	1
No	80%	4
Total		**5**

Q21. If yes, please select from below

Answer Choices	Responses	No.
Tighter controls over data providers e.g. registration of institutions who control local access	100%	1
Implementation of a hierarchy of users, e.g. institutional manager/editor	100%	1
On first registration users are presented with a walkthrough video/ navigation pop-ups/further guidance etc	100%	1
Visibility of support documentation improved on registry landing page	100%	1
Other (please specify)	100%	0

Q22. How would you rate the user interface/design of the metadata registry web tool?

Answer Choices	Responses	No.
Very Good	0.00%	0
Good	60.00%	3
Average	40.00%	2
Poor	0.00%	0
Very poor	0.00%	0
Total		**5**

Q23. What improvements would you consider necessary to the metadata registry web tool?

Answer Choices	Responses	No.
Better layout & design	20%	1
Improved introductory and/or explanatory documentation	60%	3
Improved help/support documentation	60%	3
Improved technical support	20%	1
Other (please specify) *"The possibility to load data directly from spreadsheets or XML files"*	20%	1
Total		**5**

Q24. Please rate how important it is to improve the following in the registry web tool:

Answer Choices	Very Important	Important	Less important	Not Important	No.
Design/User Interface	0% 0	0% 0	60% 3	40% 2	5
Support documentation	40% 2	60% 3	0% 0	0% 0	5
Facility for previewing data	40% 2	20% 1	40% 2	0% 0	5
Help texts/pop-ups	20% 1	40% 2	20% 1	20% 1	5
Validation/Quality controls	60% 3	40% 2	0% 0	0% 0	5

Q25. Did you use the MORe aggregation tool as part of your ingest process?

Answer Choices	Responses	No.
Yes	33.3%	3
No	33.3%	3
I don't know what this is	33.3%	3
Total		**9**

Q26. Were you…

Answer Choices	Responses	No.
familiar with the MORe tool from other EU projects, e.g. Locloud, Carare	33.3%	3
given training in the MORe tool as part of the ARIADNE project	0%	0
learned how to use the MORe tool through online support/documentation	33.3%	3
Other (please specify) *"I don't know whether this was unusual to ARIADNE partners, but our MORe tool was set up, and completed in the first instance by the DCU. It was only much later that we were told about the account"*	33.3%	3
Total		**9**

Q27. Did you use any enrichment services in MORe?

Answer Choices	Responses	No.
Yes	66.7%	2
No	33.3%	1
Total		**3**

Q28. If yes, which enrichment services did you use?

Answer Choices	Responses	No.
Language	66.7%	2
DaiGazeteer	0%	0
LoGeo	50%	1
Geocode	0%	0
Rev. Geocode	0%	0
GeoInvertion	0%	0
Pelagios	0%	0
Vocabulary	0%	0
Back Link	0%	0
Thesauri mappings	100%	2
PleiadesPlus	0%	0
Perio.do mappings	0%	0
Other (please specify)	0%	0
Back Link	0%	0

Q29. Were you satisfied with your enriched data?

Answer Choices	Responses	No.
Yes	100%	2
No	0%	0
Total		**2**

Q30. Did you use any of the help/support documentation for the registry?

Answer Choices	Responses	No.
Yes	75.00%	6
No	25.00%	2
Total		**8**

Q31. Did you find this documentation helpful?

Answer Choices	Responses	No.
Yes	14.3%	1
Sometimes	57.1%	4
No (Please give details) ***"We didn't have to consult this document as the ingestion had been done for us in the first instance by the DCU."*** ***"It's too brief and incomplete"***	28.6%	2

Q32. How do you think support/help documentation could be improved?

Answer Choices	Responses	No.
More visible and/or accessible	66.7%	4
More detailed	50%	3
Less detailed	0%	0
Needs to be updated	50%	3
Needs more options e.g. live tech support, walkthrough videos etc.	50%	3
Other (please specify) ***"Example datasets to get an idea of what should be entered where."*** ***"more mapping examples"***	33.3%	2

Q33. Please use this opportunity to comment on any other aspects of the Registry which you feel need improvement:

Answer Choices
Better communication of what our responsibilities were with regard to MORe. A workshop perhaps, as was done with the Registry. Poor design with regards to mapping to the Getty AAT. AIAC had developed our OAI-PMH to deliver the AAT URIs, but MORe required us to look up the AAT preferred terms, which we believe resulted in unnecessary double handling of the data to reach the same end result.
There were some problems with the acdm:temporal
I chose average for questions 14-15 we didn't use the registry, and there was no way to skip the questions.

Q34. Were you satisfied with how your data appeared in the ARIADNE portal after ingestion?

Answer Choices	Responses	No.
Yes	55.6%	5
No (please specify) ***"It has not been ingested into the portal yet."*** ***"We had several problems to begin with. First our date spans weren't working, second, we weren't advised on the need to have landing pages as they were initially indicated as optional. We're dissatisfied with the fact that the user is unable to select two publishers in the filter options, so that our data can be compared with others."*** ***"We are still working on ingesting our data in the portal"*** ***"Place names have not been useful for geocoding and it still doesn't appears the mapping of thesauri (enrichment)"***	44.4%	4
Total		**9**

Q35. Please rate how you feel the ARIADNE Portal addresses the general use requirements of the ARIADNE infrastructure:

Answer Choices	Excellent	Good	Average	Poor	Very poor	Total
Data transparency [i.e does the portal facilitate the aim of having a better overview of available data?]	33.3% 3	66.7% 6	0% 0	0% 0	0% 0	9
Data Accessibility [i.e. does the portal facilitate data being available to the user in an uncomplicated way?]	33.3% 3	66.7% 6	0% 0	0% 0	0% 0	9
Metadata Quality [i.e. Does the portal ensure that data is well-described and implements standards for interoperability?]	0% 0	77.8% 7	22.2% 2	0% 0	0% 0	9
Data Quality [i.e. Does the portal ensure that data is complete and well organised?]	0% 0	88.9% 8	11.1% 1	0% 0	0% 0	9
International Dimension [i.e. Does the portal allow for easy access to international data, e.g. through data integration]	55.6% 5	44.4% 4	0% 0	0% 0	0% 0	9

Q36. How would you rate your overall experience of the ARIADNE portal?

Answer Choices	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
I think that I would like to use the portal frequently	0% 0	0% 0	22.2% 2	55.6% 5	22.2 % 2	9
I found the portal unnecessarily complex.	44.4% 4	44.4% 4	0% 0	11.1% 1	0% 0	9
I thought the portal was easy to use.	0% 0	0% 0	22.2% 2	55.6% 5	22.2% 2	9
I think that I would need the support of a technical person to be able to use the portal.	66.7% 6	22.2% 2	0% 0	11.1% 1	0% 0	9
I found the various functions in the portal were well integrated.	0% 0	0% 0	33.3% 3	55.6% 5	11.1% 1	9
I thought there was too much inconsistency in the portal.	33.3% 3	55.6% 5	0% 0	11.1% 1	0% 0	9
I would imagine that most people would learn to use the portal very quickly.	0% 0	0% 0	11.1% 1	55.6% 5	33.3% 3	9
I found the portal very cumbersome to use.	44.4% 4	33.3% 3	0% 0	22.2% 2	0% 0	9
I felt very confident using the portal.	0% 0	0% 0	22.2% 2	55.6% 5	22.2% 2	9
I needed to learn a lot of things before I could get going with the portal.	44.4% 4	33.3% 3	22.2% 2	0% 0	0% 0	9

Q37. Are you satisfied with the design/layout/user interface of the ARIADNE portal?

Answer Choices	Responses	No.
Yes	88.9%	8
No (please specify) ***"When I search for something it is not clear whether there is documentation to be downloaded or not. In many cases when I found interesting things I realized that there is no further documentation that I can download only a little information on the site. Since there are lots of sites in the database too much time is needed to find documentations since you have to click through dozens of them to find documentations."***	11.1%	1
Total		**9**

Q38. Which of the following facets/filters do you feel are important?

Answer Choices	Very Important	Important	Slightly Important	Neutral	Not Important	Total
Where	100% 9	0% 0	0% 0	0% 0	0% 0	9
When	77.8% 7	22.2% 2	0% 0	0% 0	0% 0	9
Resource Type	55.6% 5	33.3% 3	11.1% 1	0% 0	0% 0	9
Native Subject	33.3% 3	33.3% 3	33.3% 3	0% 0	0% 0	9
Derived Subject	33.3% 3	33.3% 3	33.3% 3	0% 0	0% 0	9
Keyword	55.6% 5	22.2% 2	22.2% 2	0% 0	0% 0	9
Contributor	22.2% 2	44.4% 4	22.2% 2	11.1% 1	0% 0	9
Publisher	22.2% 2	33.3% 3	22.2% 2	11.1% 1	11.1% 1	9
Place	77.8% 7	0% 0	22.2% 2	0% 0	0% 0	9
Dating	88.9% 8	0% 0	11.1% 1	0% 0	0% 0	9
Rights	44.4% 4	22.2% 2	33.3% 3	0% 0	0% 0	9
Language	22.2% 2	44.4% 4	33.3% 3	0% 0	0% 0	9

Q39. Do you feel that the metadata in the portal is..

Answer Choices	Yes	Partially	No	Total	Weighted Average
of a sufficient standard	77.8% 7	22.2% 2	0% 0	9	1.22
is detailed enough	66.7% 6	33.3% 3	0% 0	9	1.33
displays correctly	66.7% 6	22.2% 2	11.1% 1	9	1.44
is easily understandable	44.4% 4	55.6% 5	0% 0	9	1.56

Q40. Do you think any additional metadata fields should be displayed in the portal?

Answer Choices	Yes	Total
No	88.9%	8
Yes (please specify) ***"It would be useful to show where are documentations that can be downloaded"***	11.1%	1

Q41. Are you satisfied with the browse functions (Where, When, What) of the portal?

Answer Choices	Yes	Total
Yes	66.7%	6
No (Please give details) ***"Largely yes, but I believe the 'Display as Search' button that features on the Where browser, needs to be made more prominent on the When browser."*** ***"If the ARIADNE subject is the same as AAT subject, it would be better to say that and have the subjects be transparent."*** ***"the map jumps when I zoom on it (zooms out), it cannot be used properly"***	33.3%	3

Q42. Are you satisfied with the search function of the portal?

Answer Choices	Yes	Total
Yes	88.9%	8
No (Please give details) ***"We did not yet exactly test it but currently I am struggling to find the sites that I know are there (e.g. Iron Age burial mound cemetery in Stična, Slovenia)."***	11.1	1

Q43. Did you have any issues accessing data through the portal?

Answer Choices	Yes	Total
No	100.00%	9
Yes (Please specify)	0.00%	0