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D2.2 Initial Report on Networking and Integration

Final version

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1 Executive Summary

The deliverable reports the work done in Tasks 2.1, 2.3, 2.4, 2.5 and 2.6 during the initial 18 months, i.e. period 1 of the project, assessing it and planning the related activities for the second period, i.e. months 19-36. Work done under Task 2.2 has previously been reported under D2.1.

The overall objective of WP2 is to "Extend and Support the ARIADNE community", which is being achieved through physical and online meetings, training events and conferences. There has been a focus on engaging with new partners to bring them rapidly to the same level of awareness as those who participated in the previous project, and a particular aim to extend our coverage in Central and South eastern Europe. We are also working with major associations and international bodies such as the European Archaeological Council (EAC), European Association of Archaeologists (EAA), to help promote a FAIR approach to archaeological data, and to inform strategic policy making. We are targeting archaeological professionals and heritage managers, who may be less aware of ARIADNE than those working in academic and research institutions, but they are responsible for the creation and curation of large quantities of archaeological data. Finally, we are working with our international partners to extend the reach of ARIADNEplus beyond Europe.

As a result of the Covid-19 pandemic some activities have had to move online but this has not led to any major deviations from the work plan for Workpackage 2, which is on schedule, and may actually provide additional opportunities for reaching wider audiences.

In the next work period, we anticipate that the new portal will allow us to demonstrate the benefits of data aggregation according to the enhanced AO-Cat data model, as well as new ARIADNEplus services. Therefore, some activities will also be intensified:

- Special attention will be dedicated to new communities being incorporated in the ARIADNEplus one, such as palaeoanthropology, bio-archaeology and environmental archaeology.
- All partners will be encouraged to hold national and regional ARIADNEplus promotion and training events in their own countries.
- New partners will be more intensively involved through their data aggregation.
- We will seek to recruit more Associate partners, particularly in Southern and Eastern Europe.
- We will promote the benefits of ARIADNEplus to heritage agencies, museum curators, heritage managers, professionals and professionals or SMEs working on excavations.

2 Introduction and Objectives

This deliverable reports the work done in Tasks 2.1, 2.3, 2.4, 2.5 and 2.6 during the initial 18 months, i.e. period 1 of the project, assessing it and planning the related activities for the second period, i.e. months 19-36. Work done under Task 2.2 on reviewing community needs has previously been reported under D2.1.

The overall objective of WP2 is to "Extend and Support the ARIADNE community". ARIADNE (Archaeological Research Infrastructure for Archaeological Data Networking in Europe) was an infrastructure project funded by the European Commission under Framework7 for the period 2013-2017.[1] Networking activities raised the awareness of potential users, archaeologists and heritage managers, creating a vibrant transnational community. ARIADNE was praised by archaeological associations and institutions, including the EAA (European Association of Archaeologists) and it led to the establishment of data repositories in several countries. ARIADNE succeeded in building a community of use consisting of about 11,000 archaeologists, corresponding to one third of all European archaeologists and probably more than 50% of those using some computer support in their research. One of the aims of ARIADNEplus is to extend that community, making contact with the majority of all researchers and professionals (which is particularly important in the archaeological domain where research and heritage management often go hand in hand). ARIADNEplus also has a specific goal to broaden its international links with new partners in the USA, Japan, Latin America and Australia. This deliverable reports on steps taken during the first 18 months of the project to meet these objectives.

[1] http://legacy.ariadne-infrastructure.eu/

3 Coordinating and monitoring networking activities Task 2.1 (NA1.1) Task-leader: UoY-ADS

3.1 Engagement with archaeological partners

As the lead archaeological partner UoY-ADS has the task of coordinating the engagement and mobilisation of all archaeological partners in the development of the research infrastructure, coordinating opportunities for discussion, for example around the Special Interest Groups focussed on the development of vocabulary standards and mappings in Task 4.4, and also collaborating with external standards groups, such as Forum for Information Standards and Heritage (FISH)[2], and the North Sea Finds recording group.[3]

3.1.1 Internal Special Interest Groups

The special interest groups are aligned with the sub-tasks of T4.4, which are charged with surveying, collecting, creating and managing multilingual domain thesauri and vocabularies, as well as developing the ARIADNEplus ontology extensions built in WP 14 for specific domains to the real cases presented by partners. The initial list of sub-domains, with lead partner, and those other partners involved was defined as:

- *Paleo-anthropology* (**CENIEH**, UNIROMA1)
- *Bio-archaeology and Ancient DNA* (**FORTH (IMBB)**, UoY-ADS, OEAW, AU, HNM, UNIROMA1, DANS, RUG, DGPC)
- *Environmental Archaeology* (**SND (SEAD)**, BUP-DMS, AU, DANS, DGPC)
- *Inorganic Materials Study* (**INFN**, UoY-ADS, CYI, HNM, MIBACT- ICCU, DANS-KNAW)
- *Dating* (**INFN**, UoY-ADS, AU, HNM)
- *Field Survey* (**RUG**, PP, DANS-KNAW, ARUP-CAS)
- *Archaeological finds made by general public* (**AU**, DANS-KNAW, UoY-ADS, UH, RGK, ARUP-CAS)
- *Remote Sensing* (**ZRC-SAZU**, ARUP-CAS, HNM, CARARE)
- *Standing Structures* (**LNEC**, PIN, UoY-ADS, OEAW, BUP-DMS, NIAM-BAS, CYI, ARUP-CAS, FI, SND(LUND), DANS-KNAW)
- *Spatio-temporal data* (**ARUP-CAS**, OEAW, PP, NIAM-BAS, HNM, FI, IAA, MIBACT-ICCU(ICA), DGPC, SND(UU), KHM-UO, DANS-KNAW)
- *Maritime and underwater archaeology* (DGPC)
- *Archaeological fieldwork* (**INRAP,** OEAW, BUP-DMS, AMZ, CYI, INRAP, RGK, PP, IAA, AIAC, MIBACT- ICCU, KHM-UO, DGPC, UB, SND, ARUP-CAS, KHM-UO)
- *Inscriptions* (**UB**, PIN, FORTH(ICS) and CNR-ISTI)

[2] http://www.heritage-standards.org.uk
[3] https://finds.org.uk/news/story/284

To this list a 14th special interest group has subsequently been added, to reflect partner interests:

- *Burials* (**OEAW**, UoY-ADS, ZRC-SAZU, ARUP-CAS)

The groups use Basecamp as a forum for discussion and submit quarterly progress reports under T4.4

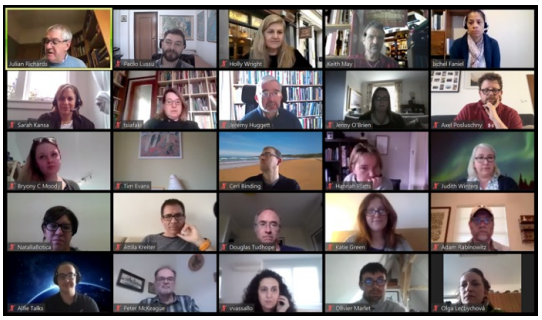
3.1.2 External Groups

An important external collaboration has been forged with a new COST Action SEADDA (Saving European Archaeology from a Digital Dark Age).[4] SEADDA developed out of a problem identified in the first phase of ARIADNE. Because archaeology has been an early and enthusiastic adopter of a wide variety of digital methods, most archaeological data, the result of decades of research funding, is being lost due to a lack of appropriate persistent repositories with specialist knowledge in most European countries. Fewer than five EU countries have repositories with the required specialist knowledge and mechanisms in place to ensure archaeological data will be freely and openly available for re-use by future generations of researchers. Failure to address this inequality means Europe will be divided into countries and regions whose archaeological research legacy is preserved, and countries and regions where it is irrevocably lost. This lack of equity also hampers participation in research collaboration. While best practice around the preservation and dissemination of archaeological data is well established in a few countries, most do not have persistently available data in interoperable formats.

The aim of SEADDA is therefore to help build capacity across Europe and to provide training events and workshops which would enable more countries and organisations to participate fully in ARIADNEplus. The Action began in February 2019, at the same time as ARIADNEplus, and also runs for four years. The Action Chair is Professor Julian Richards and the Vice Chair is Dr Paola Ronzino from PIN. Most ARIADNEplus partners are members of SEADDA allowing for a cost-effective pooling of resources around events and training activities. Short term Scientific Missions (STSM) in SEADDA have been planned to complement the short-term Transnational National Access (TNA) visits in ARIADNEplus, and so far there have been two joint workshops, made available to ARIADNEplus partners largely via SEADDA funding. The workshops, on FAIR Data management, and on Data use and Re-use, had been planned as face-to-face meetings in The Hague and York respectively in April 2020, but due to the Covid-19

[4] https://www.seadda.eu/; https://www.cost.eu/actions/CA18128/

pandemic they were redesigned, at very short notice, as virtual meetings. Both were very successful and attracted large numbers of participants.



In April 2020 ARIADNEplus partners joined the SEADDA Working Group 4 virtual workshop on Data Re-use. At any one time there were some 45 online participants in the workshop.

One day of the SEADDA workshop was jointly co-sponsored with SSHOC (The Social Sciences and Humanities Open Cloud)[5] and focussed on Data Re-Use in Heritage Science, which has been seen as a particularly challenging area. Members of ARIADNEplus and SSHOC were joined by members of the preparatory phase of E-RIHS (European Research Infrastructure for Heritage Science)[6], in a remarkable collaboration across several e-infrastructure initiatives.

Another significant collaboration has been forged with Pelagios.[7] The Pelagios Network is a long-running initiative that links information online through common references to places. To create and maintain these connections, Pelagios has developed:

1. a method for creating semantic annotations, based on the W3C Web Annotation standard;
2. tools and specifications for creating and making use of these annotations, most notably Recogito, an open-source platform for geo-annotating texts, images and databases;
3. a community of individuals and organizations working with geographic data in humanities disciplines (history, language and literary studies, archaeology, etc.), and cultural heritage (galleries, libraries, archives and museums).

The planned MoU with Pelagios will enable ARIADNEplus to reach a community of scholars focussed on the Ancient and Classical World, which complements our own expertise and partnerships, and allow us to learn from their considerable experience of using Linked Open Data to aggregate resources.

Finally, we have fostered a number of collaborations with external partners, which will help extend and embed the work being done in WP4 and WP5. We have good links with the UK FISH group (Forum

[5] https://sshopencloud.eu/
[6] http://www.e-rihs.eu/
[7] https://pelagios.org/

for Information Standards in Heritage), which has worked on controlled SKOS vocabularies for archaeology for several decades. FISH are keen to extend their work at a European level, and we planned to have a joint workshop with them at CAA Oxford, although this has had to be postponed due to Covid-19. We also share cross-membership with the North Sea and Baltic Finds recording Group, a loose collaboration which is keen to work with ARIADNEplus to implement interoperability between public finds databases held in Denmark, Finland, the Netherlands and the UK. This group is working to aggregate these datasets via the ARIADNE portal in T4.4.7. Our connections with the Getty Institute will be important here as our partner USW has agreed to work with the Getty to help extend the Getty's Art and Architecture Thesaurus (AAT) – which provides the backbone of ARIADNE's subject classification – to cover more granular classification for archaeological metalwork categories.

3.2 New communities

Special attention is being paid to new communities being incorporated in ARIADNEplus, such as palaeoanthropology, bio-archaeology and environmental archaeology, with several of the special interest groups in chosen according to the new sub-domains, which ARIADNEplus wished to extend into. Liaisons are being led by CENIEH for palaeoanthropology, with the collaboration of UNIROMA1; FORTH(IMBB) for bio-archaeology; SND (SEAD) for environmental archaeology; INFN for materials sciences and dating; and LNEC for built structures; and DGPC for maritime and underwater archaeology.

An early success has been the new collaboration with the ROCEEH project. The Role of Culture in Early Expansions of Humans (ROCEEH) is an interdisciplinary project of the Heidelberg Academy of Sciences and Humanities. Within the framework of this Research Center social scientists and natural scientists study the effect that culture had on the successive expansions of humans out of Africa and across the Old World. The Research Center is located at the University of Tübingen and the Senckenberg Research Institute in Frankfurt am Main, Germany.[8] The project was initiated in 2008 by the Heidelberg Academy of Sciences and Humanities and is scheduled to continue for 20 years until 2027. At the core of the project is the compilation of data about archaeological and paleoanthropological sites These data are organized in a multidisciplinary, web-based, geo-relational database known as ROAD (ROCEEH Out of Africa Database) with advanced geographical information system (GIS) functionality.[9] Metadata will be aggregated with other resources in ARIADNEplus later in 2020.

3.3 International conferences

Rather than organising international conferences ourselves, the strategy behind T3.3 is to maximise the opportunities provided by existing international meetings, such as those of the Society of American Archaeology (SAA), the European Archaeological Association (EAA), and the annual

[8] https://www.hadw-bw.de/en/research/research-center/roceeh/home
[9] http://www.roceeh.uni-tuebingen.de/roadweb/smarty_road_simple_search.php

conference of the Computer Applications and Quantitative Methods in Archaeology (CAA), to hold internal project meetings and to promote the ARIADNEplus approach.

These activities have got off to a strong start and, in April 2019, ARIADNEplus organised a whole day session on "Digital Infrastructures for Archaeology: Past, Present and Future directions" at CAA 2019 (the 47th Computer Applications and Quantitative Methods in Archaeology Annual Conference, 23rd–26th April) in Krakow, Poland. Existing partners from ARIADNE and new ARIADNEplus partners joined together to give a series of presentations about the current or expected Impact of ARIADNE and ARIADNEplus in their countries.[10] After an introduction by the Deputy Coordinator Professor Julian Richards, there were 14 presentations, which covered a range of topics from organisations from across Europe and also from Japan, a new partner. These topics included provision of data and services, promoting a sharing culture, how CIDOC-CRM has helped development of new tools and services, the development of archaeological databases, streamlining workflows, and connecting datasets. Another colleague, Jens-Bjørn Riis Andresen*, from Aarhus University in Denmark,* also presented a short paper "*Extending the Nordic contribution to ARIADNE+"* in a separate session which was about the Nordic Archaeological Open Science (NAOS) initiative whose aim is to provide better facilities for cross-border research.

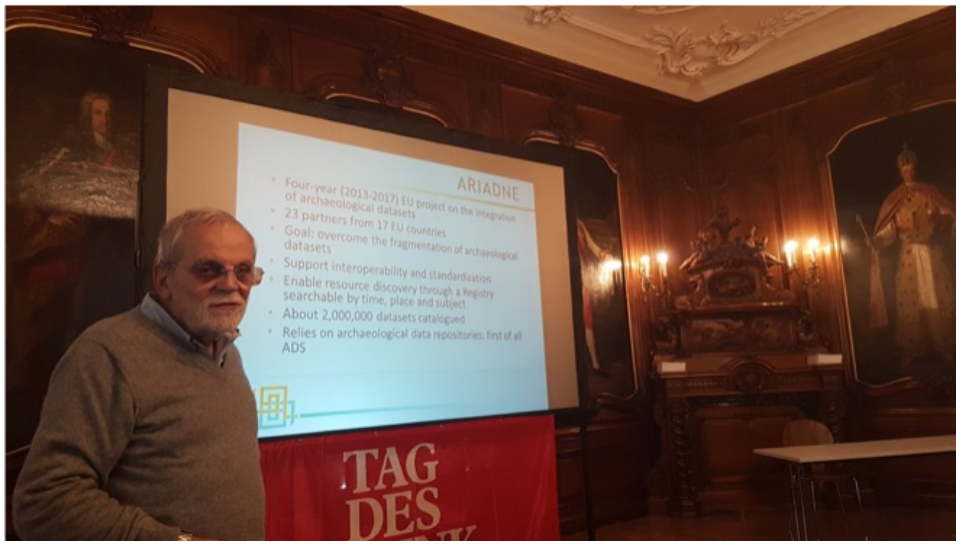
The papers presented at the session, and others commissioned from partners unable to be present were subsequently revised, edited and have been published by Archaeolingua in September 2019 as an Open Access volume entitled *The ARIADNE Impact*, edited by Julian Richards and Franco Niccolucci.[11]

[10] There is a full report on the CAA Session available for download at https://ariadne-infrastructure.eu/wp-content/uploads/2019/06/CAA2019_ARIADNE_Workshop_full_report.pdf

[11] ISBN 978-615-5766-31-2. The volume is available for download at https://doi.org/10.5281/zenodo.3476712

ARIADNEplus also had a strong presence at the EAA annual congress in Bern, Switzerland, where we held our first General Assembly on 3 September 2019. Deputy Coordinator, Julian Richards, presented a paper on "Making Archaeological Data FAIR" in which he introduced ARIADNEplus in a session on "Research data and digital corpora".

In November 2019, ARIADNEplus and SEADDA co-organised a roundtable on FAIR data at the annual conference Cultural Heritage and New Technologies (CHNT), held in Vienna, Austria.[12] Franco Niccolucci introduced ARIADNEplus, Guntram Geser talked about ARIADNEplus and community data repositories, Gerald Heibel and other ARIADNE partners discussed the impact of ARIADNE on research using prehistoric mining data and Achille Felicetti, from PIN, discussed a case study of research on Herculaneum using ARIADNEplus.



[12] https://www.chnt.at/fair-archaeology-introducing-ariadneplus-and-seadda/

For 2020-21, however, it is clear that our plans for promoting ARIADNEplus at international conferences must change, and adapt to the new circumstances brought about by the Covid-19 pandemic. The CAA conference, which was to have been held in Oxford in April 2020, has been cancelled. Other conferences have taken the decision to go ahead online. Members of the consortium were due to speak at a conference on FAIR Heritage, which was to have been held in Tours, France, organised by French partner, the CNRS Huma-Num laboratory.[13] This has now been replaced by a virtual meeting, which may actually allow a larger number of participants.

Similarly, the EAA 2020 Conference, scheduled to have taken place in Budapest in late August has also been cancelled as a face-to-face meeting, but will go ahead from remotely. At the time of writing, a virtual European conference is being planned to be held from 24 to 30 August, and we expect that several sessions co-organised by ARIADNEplus will still take place as online sessions, including one co-organised with SEADDA on "Sustainability, unsustainability and opportunity".

Our intention was also to make use of national events, sometimes organised by ARIADNEplus partners to provide networking opportunities. CAA, for example, had national chapters, and CAA Greece was to highlight ARIADNEplus at its Autumn 2020 meeting. We hope that these events can now go ahead as virtual meetings too, as partners adjust to the new world.

3.4 Internal newsletter

ARIADNEplus Research Infrastructure newsletter View this email in your browser

ARIADNEplus

Issue 3 - January 2020

Invitation for papers on sustainability of archaeological data for EAA 2020 Session 350

ARIADNEplus and SEADDA (Saving European Archaeology from the Digital Dark Age) invite papers for submission to the Session 350: *Sustainability, unsustainability and opportunity for archaeological data* at EAA in Budapest (26th-30th

Community Needs Survey Results

Barriers to deposit research data in digital repositories

Results for "very" or "rather" important [N = 398-415]

75.5% 75% 74% 69.5% 67% 62% 59% 42%

The ARIADNEplus user community needs survey is now available and covers aspects such as regarding data sharing, access and (re)use, new services (as developed by the project), and related training needs. The core groups addressed by the survey have been archaeological researchers and data managers/providers from who just over 700 responses were received of which 484 contained enough information to be included in the survey. One of the key findings was that around 45% of all survey

ARIADNEplus uses Basecamp as its primary communication channel with all partners but given the size of the consortium it was also agreed that there was a need for a regular newsletter to be circulated to all partners by email using Mailchimp software.[14] This draws on the main stories published on the website as a means of keeping everyone abreast with the key developments, and it is also sent to Associate partners, friends of the project, and the Scientific Advisory Board. Four editions have so far been published: 25/06/20, 08/10/19, 14/01/20, and 22/04/20. The newsletter is also available to anyone who wishes to subscribe via the form currently available from the news section of the website.

[13] http://www.lestudium-ias.com/event/fair-heritage-digital-methods-scholarly-editing-and-tools-cultural-and-natural-heritage

[14] https://us20.campaign-archive.com/home/?u=247dcb656eaabc04b91db04ab&id=f062d0f16f

4 Involving partners in the enhanced ARIADNEplus approach. Task 2.3 (NA1.3) Task-leader: UoY-ADS

Task 2.3 concerns activities targeted at new partners to bring them rapidly to the same level of awareness as those who participated in the previous project. It consists in preparing documentation, seminars etc. to present and explain the way ARIADNE integrates data. Such activities also include the introduction of all partners to the extended and innovative ARIADNEplus approach, such as the deeper integration of data. The ARIADNEplus community is also being informed, involved and trained in the global data strategies concerning data, such as the application of the FAIR principles to the domain and the implementation of the ARIADNEplus Cloud as a thematic cloud within the global EOSC.

The task commenced immediately from the project kick-off meeting on 11 February 2019 in Prato, Italy, with presentations on the approaches adopted to aggregation in ARIADNE. Other presentations included introductions to the FAIR principles and EOSC. During the second day each of the ARIADNEplus special interest groups from Task 4.4 (see Section 2.1) held a first meeting to allow partners to introduce their data sets and discuss how it might best be aggregated. This has been followed up by two more detailed aggregation technical workshops hosted by CNR in Pisa, on 13-14 May and 23-24 September 2019. Most data provider partners attended one or other of the workshops. Those unable to travel to Pisa joined and presented remotely, and the presentations were also recorded and made available to partners via the D4Science platform. In between meetings the sub-tasks have continued their work via on-line meetings, and by discussion within the working groups on Basecamp.

Given the impact of the Covid-19 pandemic on travel and physical meetings the virtual Steering Committee meeting held in April 2020 agreed to move more training activities online and has drawn up plans for training videos and virtual workshops, following the success of those held in March and April 2020 on the FAIR principles and data re-use (see Section 3.1.2).

4.1 Extending ARIADNEplus in Central and Southeastern Europe. Sub-task 2.3.1 (NA1.3.1) Sub-task leader: CARARE

This task is responsible for raising awareness of ARIADNEplus and involving the archaeological community in Central and South-eastern Europe including national heritage agencies, museums, and professionals. It is coordinated by the CARARE Association, with ZRC SAZU, IAVP, HNM, ARUP-CAS, AMZ and NIAM-BAS representing the target regions.

The task commenced by considering ways of reaching out to the archaeological community in Central and South-eastern Europe including communication channels and events. Meetings provided an effective way of establishing contact with representatives from the target countries. For example, a SEADDA meeting in Zagreb on 17-19 June 2019 provided an opportunity to promote ARIADNEplus to representatives from Bosnia and Herzegovina, Estonia, Lithuania, Malta, Poland, Switzerland and Turkey, who were encouraged to apply for Associate membership. Following the SEADDA meeting several organisations, including Estonia, expressed interest in providing data to ARIADNE.

Connections in Bulgaria and Georgia are also being explored. CARARE was due to present ARIADNEplus at an annual meeting of young archaeologists in Georgia on 3-5 June, but the Covid-19 pandemic resulted in the cancellation of this meeting.

Plans are being drawn up to reach out to the archaeological community in Central and South-eastern Europe to promote the online training and other resources available from ARIADNEPlus.

5 Consolidating the archaeological community around ARIADNEplus. Task 2.4 (NA1.4) Task-leader: PIN

This task continues the positive collaboration established by ARIADNE with major associations and international bodies, notably the European Archaeological Council (EAC)[15] and the European Association of Archaeologists (EAA).[16] The President of EAA and the former President of the EAC both sit on the ARIADNEplus Scientific Advisory Board, ensuring regular dialogue with both organisations. Several ARIADNE partners are also on the EAC Board, including ARUP-CAS, who lead the EAC working group on archiving standards. The EAA Board has asked for assistance from ARIADNEplus in the implementation of the FAIR principles in Archaeology, and this will be taken forward through 2020-21.

Where possible ARIADNEplus holds its annual General Assembly at the Annual meetings of the EAA, which also ensures good representation and the potential to organise sessions and workshops at the EAA conference (see 3.3.1). In September 2019 this was in Bern, and the 2020 meeting was planned to take place in Budapest in late August. Due to the cancellation of CAA 2020 for the lockdown related to the Covid epidemic, the meeting planned to take place in Oxford was also cancelled. A virtual extraordinary General Assembly was organized instead on 16 April, with the participation of all partners, an attendance of 81 people and an active discussion on the project progress globally and within each partner. As concerns the GA planned to take place at EAA, we are waiting to know the details of the EAA Virtual Conference program to finalize the GA organization.

[15] https://www.europae-archaeologiae-consilium.org
[16] https://www.e-a-a.org

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Chris Nicholson
#InThisTogether

6 Involving archaeological professionals and heritage managers. Task 2.5 (NA1.5) Task-leader: CARARE

The task concerns activities targeted at a vast community of potential users of the ARIADNEplus Cloud, such as heritage agencies, museum curators, heritage managers, professionals and professionals or SMEs working on excavations, often known as commercial, contract or preventative archaeology, to establish the ways in which ARIADNEplus may provide services for them. This could also pave the way for relationships with the industry, which in the case of ARIADNEplus consists of museums, heritage services, contract archaeologists on the one hand, and creative industries on the other. It includes investigating the feasibility of providing services on a commercial base in the future, and the related terms and conditions of use.

- Discussions with ICCU on industry sectors and contacts
- Discussions with PIN concerning the development of web-pages on the ARIADNEplus website
- Participation in meetings with Europeana data partners in the Hague (October), Stockholm (October) and Lisbon (November).

With much of the archaeological fieldwork professional in lockdown in Spring 2020 we have moved training events for this group online, piloted with an online workshop on 3D, BIM and semantics for digital documentation of archaeological and architectural heritage, on 3 April 2020, co-organised by ARIADNEplus and the Inceptions Spin-Off. The workshop was very successful with 20 presenters and about 300 attendees online. The presentations have been made available on a dedicated YouTube channel and are available at this link https://tinyurl.com/transnz

As a follow-up to this event focused on the Italian research community, ARIADNEplus co-organized, with Inception and in collaboration with the Commission DG Connect, a European workshop on the use of 3D for cultural heritage protection, resilience and communication. The event took place on 27 May with 15 international high-level speakers and more than 400 participants on YouTube.

The web Conference was titled "3D Digital Cultural Heritage for Resilience, Recovery and Sustainability. Initiatives, technologies and policies for overcoming mobility and access limitations during and after the crisis". The speakers included DG Connect officers, representatives from UNESCO, national heritage agencies, museums and creative industries, and from research communities including the ARIADNE one. It was organized in three sessions: "Resilience: 3D-based digital options when access is suspended or severely restricted"; "3D technologies for overcoming the consequences of the crisis and supporting the return to normal"; and "Sustainability: new sustainable ways of accessing and understanding cultural heritage with 3D digital technologies". Franco Niccolucci chaired one of the three sessions and Bogdan Sandric (INP, Romania) Sorin Hermon (CYI, Cyprus) and Kate Fernie (CARARE, Ireland) were speakers from the ARIADNE community, discussing the topic from the archaeological perspective and the potential contribution of ARIADNE.

6.1 ARIADNE Associates

A category of ARIADNEplus Associate members, with a dedicated area of the website,[17] is allowing us to reach out to potential supporters beyond the initial consortium, and to extend coverage in existing countries and expand into new ones. We have developed an application procedure, and so far, have admitted the University of Minho in Portugal, and the ROCEEH consortium, extending partnerships in Germany (see Section 3.2).

[17] https://ariadne-infrastructure.eu/community/

Additional applications are being developed from:

- The British School in Ankara, in Turkey, which is developing its own digital repository, supported by UoY-ADS, and also working in SEADDA.
- The British School in Athens, working with our Greek partner ATHENA to aggregate their data
- Transport Infrastructure Ireland (TII) working with partner CARARE to make their digital data available via ARIADNEplus
- University College London, working with partner the University of South Wales on Natural Language Processing, which will be our first technical associate partner.

7 International collaborations. Task 2.6 (NA1.6) Task-leader: UoY-ADS

International activities aim to strengthen the already established collaborations and to forge new relationships with international partners. Activities are focussed on realising the vision of a global digital research infrastructure for archaeology, and getting more institutions and networks involved in this ambitious project, including national networks, and existing archives outside the EU etc. The Task seeks to address, together with international partners and other world-class institutions, the problems arising from diverse approaches to data management, openness, regulations, etc.

We have worked, in particular, with existing international partners on this Task: Arizona State University (the home of tDAR, the US-based repository), CONICET, which is developing a consortium of Argentinian repositories for archaeology, and the Nara Research Institute, which aggregates tens of thousands of fieldwork reports in Japan.[18]

ARIADNE has also joined CfAS, the Coalition for Archaeological Synthesis, an international collaboration that "promotes and funds innovative, collaborative synthetic research that rapidly advances our understanding of the past in ways that contribute to solutions to contemporary problems, for the benefit of society in all its diversity. This is accomplished through the analysis and synthesis of existing archaeological and associated data from multiple cultures, at multiple spatial and temporal scales."[19] CfAS promotes large-scale collaborative research projects to address major cross-disciplinary research questions, which can only be tackled by the aggregation of large data sets

as being undertaken in ARIADNEplus. In September 2019, Franco Niccolucci participated in a workshop in Dragoon, Arizona, on 'Human Migration as Understood from a Long-Term Perspective', sponsored

[18] New international collaborations, in the Middle East and North Africa, where ARIADNEplus has no existing foothold, are the focus of a task force led by AIAC in WP6 and progress to date has been reported separately in D6.1)

[19] http://archsynth.org/

by the Society for American Archaeology, the Society for Historical Archaeology and the European Association of Archaeologists.

The workshop was attended by 19 participants from seven countries, representing work on six continents, ranging from the Palaeolithic to contemporary migrants, with expertise that varied from aDNA to ethnography. ARIADNE contributed expertise on archaeological data. The workshop produced three groups working on different aspects of human migrations and preparing projects to be submitted to the National Science Foundation NSF) to obtain support for future work.

From 19-21 November 2019 we undertook a mission to Buenos Aires in Argentina, organized by ARIADNEplus through its partners PIN and INFN in collaboration with the University of San Martin (UNSAM) and the Italian Embassy and Italian Institute of Culture in Buenos Aires.

During the mission a workshop was held at the Italian Institute of Culture (IIC) in the morning of 20 November 2019 on archaeological and heritage science, including the management of scientific data. The workshop continued in the afternoon of 20 November 2020 at the Fundación Williams, with a focus on archaeological data management in Argentina. The first part was organized by PIN, INFN and IIC; the second part was organized by Andrés Izeta (CONICET, Cordoba), the local ARIADNEplus partner, with the participation of the Argentinian Network on archaeological data. There were presentations by Francesco Taccetti (INFN), Franco Niccolucci (PIN, ARIADNEplus coordinator), Andrés Izeta (CONICET, Cordoba), Juan Manuel Capuano (CONICET, Olavarria), and Rossana Ledesma (CONICET, Salta) with some 30 participants drawn from across Argentinian universities.

Other events included meetings at UNSAM with the faculty and the rector, a visit to their facilities under construction, where an office may be allocated to this international collaboration, and other informal meetings with local researchers. There were plans to extend this collaboration to other Latin American countries in 2020, with a possible enlarged workshop at the end of the year, but they were put on hold for the coronavirus pandemic emergency.

In January 2020, the Deputy Coordinator, Professor Julian Richards, attended the Annual Meeting of the Society for History Archaeology, which was held in Boston in the United States, where he presented ARIADNEplus at a roundtable on synthesis in historical archaeology sponsored by CfAS.

In February, Professor Richards, travelled to Tempe in Arizona to attend a workshop organised by partner Arizona State University on the difficult issues surrounding the preservation and access of complex archaeological datasets. Professor Niccolucci attended the meeting remotely. The group, which also included representatives of CyberSouthwest, DataONE, and OpenContext, agreed to establish FAIRarchaeology.org and to seek National Science Foundation funding for a number of joint

workshops with ARIADNEplus and the SEADDA COST action aimed at developing implementation guidelines for the FAIR principles in archaeology, with recommendations for key bodies, such as EAA and SAA.

Meanwhile, our Japanese ARIADNEplus partner, the Nara Research Institute, have been focussing on increasing the number of records they will make available to ARIADNEplus, now totalling 130,398 records for archaeological investigations in Japan, 68,902 bibliographic records, and 24,619 online fieldwork reports. In addition, they have translated parts of the Guides to Good Practice, enhanced in ARIADNEplus, used them in training programmes, and distributed them to every research organisation in Japan. In conclusion…

8 Deviation from work plan

For Work Package 2, and the tasks and activities described in this report, there have been no significant deviations from the work plan as defined in the description of work. ARIANDEplus partners have met regularly, either physically or online, in the context of general meetings, technical workshops, or training events. We have had to react to external circumstances, notably the Covid-19 pandemic, but this has happened without major disruption and has, indeed, encouraged higher levels of attendance than would have been possible with face-to-face meetings.

Networking activities are also inevitably reactive to new opportunities, such as the collaboration with ROCEEH, to whom we were introduced at the migration workshop organised by CfAS in Arizona.

Task 2.5 has so far proceeded slowly, as engaging with potential users is best done once the new ARIADNE portal is established, and the consortium has services that it can demonstrate. This activity will be accelerated in Years 3 and 4.

9 Plans for the next period

In the remaining part of Year 2, and in years 3 and 4, we envisage that most of the activities described in this report will be maintained and continued, as envisaged in the workplan. As the new portal allows us to demonstrate the benefits of data aggregation according to the enhanced AO-Cat data model, as well as new ARIADNEplus services, we anticipate that some activities will also be intensified:

- Special attention will be given to new communities being incorporated in the ARIADNEplus one, such as palaeoanthropology, bio-archaeology and environmental archaeology.
- All partners will be encouraged to hold national and regional ARIADNEplus promotion and training events in their own countries.
- New partners will be more intensively involved through their data aggregation.
- We will seek to recruit more Associate partners, particularly in Southern and Eastern Europe.
- We will promote the benefits of ARIADNEplus to heritage agencies, museum curators, heritage managers, professionals and professionals or SMEs working on excavations.