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Table of Contents

1	Executive Summary	5
2	Introduction and Objectives	6
3	Coordinating and monitoring networking activities Task 2.1 (NA1.1) Task-leader: UoY-ADS	7
3.1	Engagement with archaeological partners	7
3.1.1	Internal Special Interest Groups	7
3.1.2	External Groups	8
3.2	New communities	10
3.3	International conferences	11
3.4	Internal newsletter	13
4	Involving partners in the enhanced ARIADNEplus approach. Task 2.3 (NA1.3) Task-leader: UoY-ADS	14
4.1	Extending ARIADNEplus in Central and South-eastern Europe. Sub-task 2.3.1 (NA1.3.1) Sub-task leader: CARARE	15
5	Consolidating the archaeological community around ARIADNEplus. Task 2.4 (NA1.4) Task-leader: PIN	16
6	Involving archaeological professionals and heritage managers. Task 2.5 (NA1.5) Task-leader: CARARE	18
7	ARIADNE Associate Partners	20
8	International collaborations. Task 2.6 (NA1.6) Task-leader: UoY-ADS	22
9	Conclusions	24

1 Executive Summary

This Deliverable D2.5 reports the work done in Tasks 2.1, 2.3, 2.4, 2.5 and 2.6, and follows on from the interim report at Month 36 (D2.4). Work done under Task 2.2 has been reported in D2.3.

The overall objective of WP2 is to “Extend and Support the ARIADNE community”. This has been achieved partly through online meetings, training events and conferences, social media, and promotional materials. There has also been a focus on engaging with new partners to bring them 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 have also worked with major associations and international bodies, such as the European Archaeological Council (EAC) and European Association of Archaeologists (EAA), to help promote a FAIR approach to archaeological data, and to inform strategic policy making. We have tried to target archaeological professionals and heritage managers, who may be less aware of ARIADNE than those working in academic and research institutions. In addition, we have worked closely with our international partners to extend the reach of ARIADNEplus beyond Europe.

As a result of the COVID-19 pandemic, there was a reduction in the number of face-to-face networking opportunities between M18 and M36; nearly all meetings had to be held online but this did not lead to any major deviations from the workplan. Face-to-face events resumed from summer 2022, with a major ARIADNEplus presence at the 2022 EAA and CHNT conferences. Since our interim report at M36, the ARIADNEplus portal has allowed us to demonstrate the benefits of data aggregation according to the enhanced AO-Cat data model, and this activity intensified during the final work period.

We have extended the ARIADNE community by creating a category of Associate partners. This has been hugely successful, with 17 organisations joining the consortium, in a self-funding capacity, but amounting to over 24 person months of discretionary effort. This has allowed us to provide integrated access to several additional internationally important datasets. Other organisations, such as the British Museum, have not joined as formal Associate partners, but have invested time and staff resource in working with an ARIADNE partner to provide access to their own data. Several of the European schools abroad, including French and British schools based in Athens and Ankara, have been keen to participate. Our emphasis on south-eastern Europe has attracted associate partners in countries such as North Macedonia, Serbia, Croatia and the Slovak Republic, where there has been little previous tradition of open access to research data in archaeology and heritage.

In conclusion, within the project lifetime ARIADNE has become established as a major component of the European e-infrastructure. It is certainly the largest research data aggregator within the Arts and Humanities, and a significant player across all disciplines. This leaves us with confidence for the future sustainability, and in the last few months of the current funded project we are exploring the best options to maintain the community we have established.

2 Introduction and Objectives

This Deliverable D2.5 reports the work done in Tasks 2.1, 2.3, 2.4, 2.5 and 2.6, and follows on from the interim report at Month 36 (D2.4). Work done under Task 2.2 has been reported in D2.3.

The overall objective of WP2 was 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 Framework 7 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 has been 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). This has been partly achieved through online meetings, training events and conferences, social media, and promotional materials. 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 have also worked with major associations and international bodies, such as the European Archaeological Council (EAC) and European Association of Archaeologists (EAA), to help promote a FAIR approach to archaeological data, and to inform strategic policy making. We have tried to target archaeological professionals and heritage managers, who may be less aware of ARIADNE than those working in academic and research institutions. We have also developed the ARIADNE community by creating a category of Associate partners. This has been hugely successful, with 17 organisations joining the consortium, in a self-funding capacity. Finally, ARIADNEplus also had 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 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 had 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 the 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 were aligned with the sub-tasks of T4.4, which were charged with surveying, collecting, creating and managing multilingual domain thesauri and vocabularies, as well as developing the ARIADNEplus ontology extensions built in WP14 for specific domains to the real cases presented by partners. The list of sub-domains, with lead partner, is as follows:

- Paleo-anthropology (**CENIEH**)
- Bio-archaeology and Ancient DNA (**FORTH - IMBB**)
- Environmental Archaeology (**SND - SEAD**)
- Inorganic Materials Study (**INFN**)
- Dating (**INFN**)
- Field Survey (**RUG**)
- Archaeological finds made by general public (**AU**)
- Remote Sensing (**ZRC-SAZU**)
- Standing Structures (**LNEC**)
- Spatio-temporal data (**ARUP-CAS**)
- Maritime and underwater archaeology (**DGPC**)
- Archaeological fieldwork (**PP**) having taken over leadership from INRAP
- Inscriptions (**PIN**) having taken over leadership from UB
- Burials (**OEAW**)

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

² <http://www.heritage-standards.org.uk>

³ <https://finds.org.uk/news/story/284>

3.1.2 External Groups

An important external collaboration has been forged with the 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 is 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. It has been awarded a funded extension until September 2023, which will allow the continued promotion of ARIADNEplus during 2023. The Action Chair is Professor Julian Richards, ARIADNE Deputy Coordinator and WP2 task leader, and the Vice Chair is Dr Edeltraud Aspöck from ARIADNEplus partner OeAW. Most ARIADNEplus partners are members of SEADDA, enabling cost-effective pooling of resources around events and training activities.

In 2021, SEADDA collaborated with ARIADNEplus partners to create a co-edited special issue of the peer-reviewed e-journal *Internet Archaeology*, entitled “Digital Archiving in Archaeology: The State of the Art”.⁵ The editors were Ulf Jakobsson (SND), David Novák (ARUP), Benjamin Štular (ZRC-SAZU) and Holly Wright and Julian Richards (UoY-ADS). The publication was jointly sponsored by SEADDA and the European Archaeological Consilium (EAC), which is the umbrella group that represents all European state heritage bodies. 21 contributions, plus an introduction, were published on 31 May 2021, and six additional papers were added in December 2021. The papers included contributions from the majority of ARIADNEplus partners, to which we were also able to add contributions from three ARIADNEplus Associate Partners from Serbia, Slovakia and Portugal. Our international ARIADNEplus partners in the Nara Research Institute (Japan), CONICET (Argentina), and ASU (United States) also provided contributions. The volume provides an important benchmark statement for the current state of data management and preservation across Europe and beyond.

⁴ <https://www.seadda.eu/>; <https://www.cost.eu/actions/CA18128/>

⁵ <https://doi.org/10.11141/ia.58.23>



Figure 1: European countries represented in the *Internet Archaeology* special issue

In 2022 we were able to publish the results of a survey of data management policies and practices of digital archaeological repositories in Europe and beyond. The survey was carried out in 2021 under the auspices of ARIADNEplus and SEADDA. Its main purpose was to collect and analyse information about current policies that determine access to and reuse of data held by digital archaeological repositories, and to investigate the guidance and support needed to make these repositories and data FAIR (Findable, Accessible, Interoperable and Reusable).⁶

In addition, the collaboration with SEADDA allowed ARIADNEplus partners to benefit from online “Novice-To-Know-How” training in digital preservation, led by the International Digital Preservation Coalition.

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’s FISH (Forum for Information Standards in Heritage) which has worked on controlled SKOS vocabularies for archaeology for several decades. We also share cross-membership with the North Sea and Baltic Finds Recording Group, a loose collaboration which has worked with ARIADNEplus to implement interoperability between public finds databases held in Denmark, Finland, the Netherlands and the UK in Sub-task 4.4.7.

⁶ Geser, G., Richards, J.D., Massara, F. and Wright, H. 2022 Data Management Policies and Practices of Digital Archaeological Repositories, *Internet Archaeology* 59. <https://doi.org/10.11141/ia.59.2>

3.2 New communities

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

The collaboration with the Role of Culture in Early Expansions of Humans (ROCEEH) project has been a particular highlight. ROCEEH is an interdisciplinary project of the Heidelberg Academy of Sciences and Humanities. 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.⁷ Metadata was aggregated with other resources in ARIADNEplus in September 2021 and is now being updated every six months. More than 2,000 prehistoric localities from ROAD are now findable in ARIADNEplus by simply searching for the name of a site (e.g. Olduvai, Dmanisi, Hohle Fels). In addition to the basic information about a site displayed in ARIADNEplus, a user can enter a site name and download a PDF of the “ROAD Summary Data Sheet” directly from ROAD.

As an outcome of work done by the Burials sub-group, ARIADNEplus partner ARUP initiated a collaboration with the Austrian project THANADOS.⁸ THANADOS is an aggregator for information about archaeological burials. The project comes to an end in 2022 but the THANADOS consortium has joined ARIADNEplus as an Associate Partner and THANADOS data has been aggregated in the ARIADNEplus portal. It proved relatively straightforward to map their data to the AO-Cat, providing a good degree of interoperability with the ARIADNE knowledge base as the data had already been mapped to the Getty AAT and periods are registered in PeriodO. THANADOS data has been included in ARIADNE at several levels of granularity: cemetery, burial and artefact, demonstrating the efficacy of the ARIADNE resource types as filtering mechanisms, according to the level of interest.

⁷ http://www.roceeh.uni-tuebingen.de/roadweb/smarty_road_simple_search.php

⁸ <https://thanados.net>

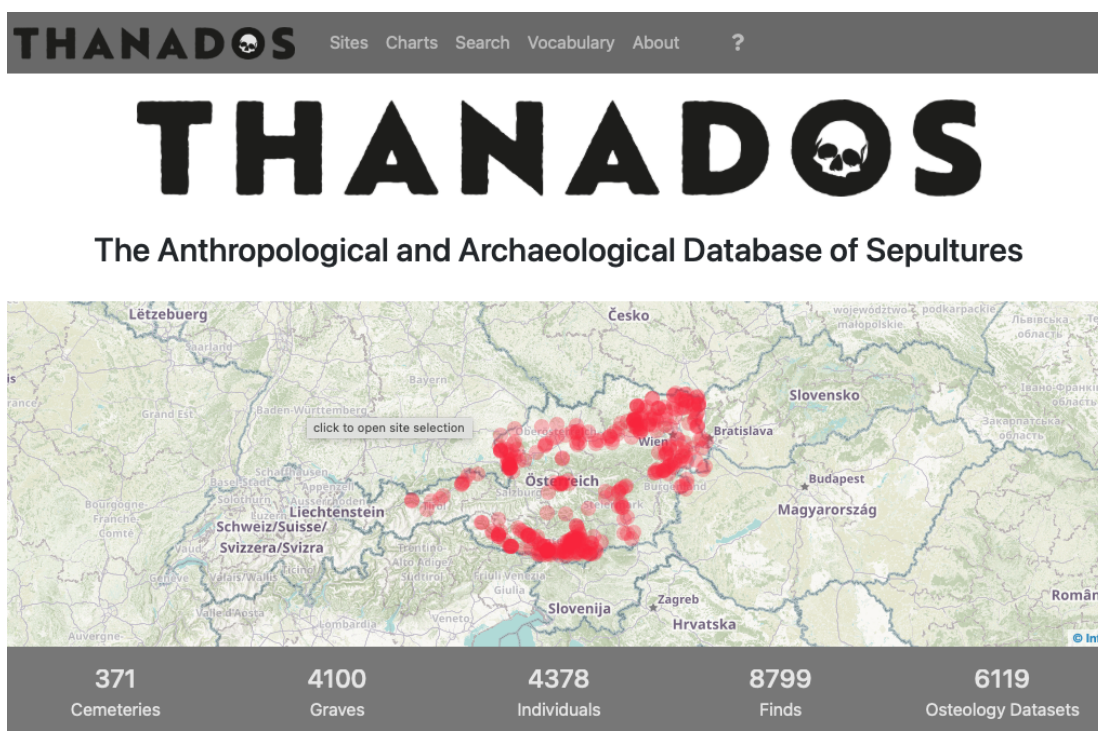


Figure 2: THANADOS web site

Representatives of ARIADNEplus from UoY-ADS and PIN have joined the reference group for project Urdar, a research infrastructure for archaeological excavation data, led by the Swedish National Heritage Board, and funded by a Swedish Riksbankens Jubileumsfond infrastructure grant. The collaboration with ARIADNEplus has ensured that common standards, vocabularies and best practices being developed in Urdar are aligned with those being fostered in ARIADNEplus.

ARIADNE is also represented on the Advisory Board of the EXALT project, hosted by the University of Leiden. EXALT is using AI approaches to extract subject terms from archaeological grey literature, and is making use of approaches and resources developed in ARIADNE.

3.3 International conferences

Rather than organising international conferences ourselves, the strategy behind T2.3 has been 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 conference of the Computer Applications and Quantitative Methods in Archaeology (CAA), to hold internal project meetings and to promote the ARIADNEplus approach.

Conference sessions organised under the auspices of ARIADNEplus at the 2020 and 2021 CAA and EAA conferences were reported in Deliverables D2.2 and D2.4 and that information is not repeated here. However, we took advantage of the resumption of in-person conferences to

have a strong presence at the EAA conference held in Budapest early September 2022, including an ARIADNE booth in the exhibition space.



Figure 3: The ARIADNEplus stall in the exhibition hall at the annual conference of the European Archaeological Association (EAA) in Budapest, September 2022

We also organised a joint session at EAA2022 with SEADDA, entitled “Fairly Front-Loading the Archive: Moving Beyond Findable, Accessible and Interoperable to Reuse of Archaeological Data”. Many ARIADNEplus partners presented papers, with additional contributions from those outside the project. Contributions included a presentation from the Salzburg Research Institute on the survey of archaeological repositories and from UoY-ADS on the use of the ARIADNE portal for research. ROCEEH spoke about the impact of ARIADNEplus on the implementation of the FAIR principles within their own project. There was also a presentation of the final report from the ARIADNE working group on excavation data, organised under WP4 sub-task 4.4.12. From Argentina, CONICET presented how the data made available via ARIADNE was being used in heritage management, and for the protection of archaeological sites from road developers. Our Associate partner, the University of Innsbruck, showing how the prehistoric mining data provided to ARIADNE was being linked to other triplestore data sources.

We have also organised an all-day session at the CHNT/ ICOMOS conference, which will be held in Vienna in 11 November 2022. Julian Richards of UoY-ADS will give a keynote address

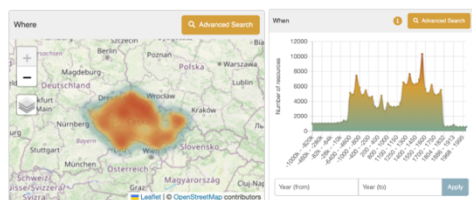
on ARIADNEplus, followed by 12 presentations from partners on various aspects of the project, but with a focus on using the ARIADNE e-infrastructure for research.

In addition, from 29 November to 1 December 2022, the biannual Linked Pasts conference will be hosted by UoY-ADS in York. The conference brings together the Linked Open Data community, and CNR are working with UoY-ADS to organise a hackathon, featuring the triplestore which forms the ARIADNE knowledge base, and challenging participants to develop new ways of interrogating the triplestore and linking it to other open data resources.

Finally, we will bring this phase of ARIADNE to a close with an open meeting in Florence and Prato on 15-16 December 2022, celebrating the achievements of the project.

3.4 Internal newsletter

New enhanced Portal to launch



For the last few months, there has been a lot of activity behind the scenes on improving the search facilities of the Portal. As well, over a million new metadata records have been uploaded, bringing the current total to over 3 million. New collections include those held by CONICET, Argentina, the British Museum, UK and INRAP, France with more on the way. The Data Management Plan Tool (protocol and two templates) and an upgraded version of the Visual Media Service have been added to the services.

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.⁹ 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. Interested parties can also sign up to receive the newsletter on the News section of the website. There are currently 255 subscribers.

Figure 4: Lead story October 2022 edition

Since Deliverable 2.4 two more editions have been published: on the 21st March 2022 and 5th October 2022. At least one more newsletter is planned before the end of the project with the aim of promoting the portal, services and pilots, and the final event to be held in Florence.

⁹ <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 concerned activities targeted at new partners to bring them to the same level of awareness as those who participated in the previous ARIADNE project. It has consisted 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 has also been 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. In addition, meetings of the ARIADNEplus Steering Committee have been opened up beyond the Work Package leaders so that all partners have been kept updated on progress with ARIADNE activities.

Meanwhile, there have also been online working group meetings of the specific Special Interest Groups (see Section 3.3.1), as they develop application profiles for their sub-domains. Those associated with fieldwork, burials, inorganic materials, dating and bio-archaeology and ancient DNA have been the most active but task leaders from PIN and UoY-ADS have also held over 25 one-to-one online meetings with other partners to provide guidance on data aggregation.

Written documentation on the aggregation pipeline has been provided from the outset and regularly updated by CNR and UoY-ADS. In recognition of the technical complexity of the process, in February 2022 we created an internal document aimed at the archaeological data providers entitled: "Data Aggregation Pipeline: an Abbreviated Guide for Data Providers". Using our experience to date, this guide focussed on the core information required to provide data to the ARIADNEplus infrastructure. Once finalised, at the conclusion of the project, it will be made openly available via the project website.

One of the highlights of involving partners in the enhanced ARIADNEplus approach has been the introduction of VRE use cases workshops, undertaken by SFRG, supported by UoY-ADS and PIN. The workshops engaged partners in the design of the VREs to be delivered in WP15 and WP16. These workshops addressed two of the thematic domains represented in ARIADNEplus: Geospatial and Mortuary Data and Research (January 2021), and Ancient DNA and Environmental Data and Research (May 2021). The workshops were reported on more extensively in D2.3 Section 5. A workshop held in October 2022, organised under the auspices of WP16, allowed all the involved partners to preview the WP case studies, and consider their connections to the ARIADNE knowledge base.

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

The focus of this task concerned raising awareness of ARIADNEplus amongst the archaeological community in central and south-eastern Europe, which has a less well-established tradition of participating in European projects. The task was coordinated by the CARARE Association with ZRC-SAZU, IAVP, HNM, ARUP-CAS, AMZ and NIAM-BAS.

Archaeologists in the target countries (Poland, Slovakia, Hungary, Croatia, Bosnia, Montenegro, Serbia, Bulgaria and Ukraine) use digital technologies but are at various stages in the adoption of systems that allow for data sharing and opening access. Within the task, activities initially focussed on understanding which aspects of the ARIADNE plus project were likely to be of most interest to the archaeological community in the region. The partners in the task worked together with PIN developing an update to the ARIADNEplus cooperation agreement, which highlights the opportunities for capacity building and participation in special interest groups as well as for data sharing.

Activities then focussed on identifying contacts within the target countries and ways of reaching out to the community in the target region. CARARE followed up individual contacts, which resulted in both new institutions joining ARIADNEplus as associate partners (from the Slovak Republic, North Macedonia and Croatia) and in introductions to archaeologists in neighbouring countries. We also reached out to the community through events. SEADDA meetings provided a way of reaching out to representatives from countries new to ARIADNEplus including Bosnia and Herzegovina, Estonia, Lithuania, Malta, Poland, Switzerland and Turkey. The COVID-19 pandemic resulted in a number of events being cancelled during 2020 and 2021 which had an adverse impact on plans to reach out in person by participating. As a result, activities moved online.

CARARE planned and delivered a series of focus groups to reach out to heritage managers across Europe, which are reported under the framework of T2.5 below. The focus groups raised awareness of ARIADNEplus, the Portal, Training Hub and other resources; and resulted in a new associate partner from Serbia joining the network. The collaboration with SEADDA allowed the provision of data management workshops in Portugal, Serbia and Turkey.

An important collaboration has been forged with the Horizon 2020 funded 4CH¹⁰ project, which is establishing a competence centre for conservation of the cultural heritage. In February 2022 Russian troops invaded Ukraine putting its cultural heritage at risk and 4CH launched the SUM initiative - Save the Ukraine Monuments to save digital documentation. PIN and CARARE supported SUM which has been reaching out to cultural heritage professionals, institutions and companies in Ukraine. At this stage the focus is on rescue of the digital data.

¹⁰ <https://www.4ch-project.eu/>

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

This task continued the positive collaboration established by ARIADNE with major associations and international bodies, notably the European Archaeological Council (EAC)¹¹ and the European Association of Archaeologists (EAA).¹² 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. The incoming President of the EAC is Ann Degraeve, who is Head of Department of Archaeological Heritage in Brussels, an ARIADNEplus partner organisation. Several ARIADNEplus partners are also on the EAC Board, including ARUP-CAS, who lead the EAC working group on archiving standards.

With the resumption of in person meetings we held our 2022 General Assembly in conjunction with the EAA conference in Budapest, but adopted a hybrid format to maximise participation



Fig 5: ARIADNEplus combined Steering Committee and General Assembly meeting, annual conference of the European Archaeological Association (EAA) in Budapest, September 2022.

¹¹ <https://www.europae-archaeologiae-consilium.org>

¹² <https://www.e-a-a.org>

We have also welcomed the new President of the EAA, Professor Eszter Banffy, as a member of ARIADNEplus Scientific Advisory Board. Since 2013, Professor Banffy has been Director of ARIADNEplus German partner: the Romano-Germanic Commission at the German Archaeological Institute (DAI).

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

As a research data infrastructure, ARIADNEplus's core community is among research institutions, researchers and managers of research data repositories. Networking activities during ARIADNE (the Framework 7 funded infrastructure project, 2013-2017) raised awareness amongst potential users of these research outputs including professionals. One of the aims of ARIADNE plus has been to extend the community and this task concerns activities targeted at heritage agencies, museum curators, heritage managers and archaeological professionals (for example archaeologists working in commercial, contract or preventive archaeology). It is coordinated by the CARARE Association with PIN, UoY-ADS, MIBACT-ICCU and DGPC.

The task recognised that archaeological professionals and heritage managers are less aware of ARIADNE than those working in academic and research institutions. Their focus is typically on national or regional data resources rather than international data research infrastructures. The professional community is relatively small with a good level of engagements with international associations such as the European Archaeological Council (EAC) and the European Association of Archaeologists (EAA). ARIADNEplus is working with these associations to promote good practices in archaeological data management and the FAIR principles for archaeological data.

Under the framework of this task, CARARE planned and, with PIN, delivered a series of focus groups to reach out to heritage managers across Europe. CARARE prepared a presentation to provide an introduction to ARIADNEplus, demonstrate the Portal, Training Hub and a set of case studies. The presentation was used at the start of the focus group meetings and was made available in English and Italian (with help from MIBAC-ICCU and PIN). The four focus group meetings were:

- December 2021 (CARARE) with participants from Bulgarian Academy of Sciences; Transport Infrastructure Ireland; Monuments Board of the Slovak Republic; Urban Planning Institute of the Republic of Slovenia; and the Laboratorio de Documentación Geométrica del Patrimonio, University of the Basque Country.
- February 2022 (CARARE) with participants from the Mathematical Institute SANU, Serbia; Historic Scotland; Institute of Archaeology, Zagreb; and North Macedonia, Directorate for Protection of Cultural Heritage.
- March 2022 (MIBAC-ICCU and PIN) with participants including a Freelance Senior Archaeologist; Superintendence of Archaeology, Fine Arts and Landscape of Umbria Department; Cooperative Society Matrix 96; Cooperative Society Adarte srl; Central Institute for Archaeology; and the Regional Secretariat of the Ministry of Culture and Tourism for Emilia-Romagna.
- March 2022 (CARARE) with participants from the Swedish National Heritage Board and the Library, Archives and Archaeological Collections, Finnish Heritage Agency.

During each session participants were asked to give feedback on the ARIADNEplus portal, on the benefits to their organisation (or organisations in their country or region) in participating in the initiative, on which aspects of the Training Hub they found the most useful and were given opportunities to make comments and suggestions. Participants liked the ARIADNE plus portal and found the search facilities to be user friendly but commented that its value for heritage management depends largely on the availability of data for their country or region. Several participants asked how easy it is to upload data to the system. One responded commented that ARIADNE plus can be inspirational noting that as more content is shared for their country, use by researchers and professionals will increase. However, one participant noted that contracting archaeologists are more likely to use national systems (in the national language) and less likely to need data from across country boundaries. In general, participants were interested in the training hub and the potential for ARIADNEplus to inspire new systems developments (including work on structuring and standardising data) and the take up of open science practices. Participants commented that it would be useful to have access to training materials on key topics in their national language. Several commented on the need for training in the digital humanities, from basic training (in the what, why and how) to more advanced topics such as virtual research environments.

In 2022, CARARE presented ARIADNE plus at a Symposium of the Architecture, Restoration and Archaeology professionals in Romania (ARA symposium¹³) giving a broad overview of what ARIADNEplus offers to researchers and managers of archaeological heritage objects and data including the portal, services and the training hub.



Figure 6: Poster promoting the ARA22 symposium in Romani in which there was a dedicated ARIADNEplus session

¹³ <http://www.simpara.ro/ARA-22-626.htm>

7 ARIADNE Associate Partners

A category of ARIADNEplus Associate members, with a dedicated area of the website,¹⁴ has allowed us to reach out to potential supporters beyond the initial consortium, and to extend coverage in existing countries and expand into new ones.

This category of members has increased further since D2.4, with the addition of The Mathematical Institute of the Serbian Academy of Sciences and Arts, the École française d'Athènes, and the Humboldt University of Berlin. We now have a total of 17 organisations, variously involved in training, data management, collaboration in working groups, or technology development. The table below provides the list of Associate Partners at M46, and identifies their involvement in ARIADNEplus.

It is extremely encouraging to review the level of enthusiasm to be involved in the ARIADNE initiative, from those beyond the initial funded collaboration. These associate partners have given freely of their time, and it is estimated that through their unpaid effort, we have leveraged at least an additional 24 person months over the duration of the project. This clearly bodes well for the sustainability of ARIADNE beyond the existing funded project.

Institution/Project	Topic	Country	Activities
The Role of Culture in Early Expansions of Humans (ROCEEH)	Palaeontology	Germany	Data sharing
The University of Minho Archaeology Unit (UAUM)	Roman Coins	Portugal	Data sharing
IsoArch	Isotope database bioarchaeological samples	France	Data sharing
University College London (UCL)	Natural Language Processing	UK	Entity recognizer for archaeological and dendrochronology named entities in English, Dutch, and Swedish
The British Institute at Ankara (BIAA)	Archaeology project activity	Turkey	Involvement in project activities
British School at Athens (BSA)	Archaeological project data	UK	Data sharing
Institute of Archaeology in Zagreb	Basic and applied archaeological research	Republic of Croatia	Data sharing

¹⁴ <https://ariadne-infrastructure.eu/community/>

Institution/Project	Topic	Country	Activities
Monuments Board of the Slovak Republic (MBSR)	Archaeological sites and fieldworks	Slovak Republic	Involvement in project activities
Takin.solutions Ltd.	Information management solutions in the CH sector	Bulgaria	Involvement in project activities
Directorate for Protection of Cultural Heritage (DPCH)	Protection of CH	Republic of North Macedonia	Involvement in project activities
University of Innsbruck	Prehistoric copper production in the eastern and central Alps	Austria	Data sharing
Centro Interdipartimentale di Servizi di Archeologia (Università di Napoli L'Orientale)	Archaeology project activity	Italy	Involvement in project activities
DataARC/ipaast	Data standards for aggregation	UK	Involvement in project activities
Natural History Museum in Vienna	THANADOS burials aggregator	Austria	Data sharing
The Mathematical Institute of the Serbian Academy of Sciences and Arts	Archaeological project data	Serbia	Data sharing
École française d'Athènes	Archaeological project data	Greece	Data sharing
Humboldt University of Berlin	Ancient monuments data linked to Renaissance and 17 th and 18 th related resources	Germany	Data sharing

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

International activities aimed to strengthen established collaborations and to forge new relationships with international partners. Activities were 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 sought 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, and aggregation of data from each of these international partners has been concluded.

ARIADNE 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.”¹⁵ 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.

During ARIADNEplus we have also forged new partnerships, focussing on Asia and Africa. ARIADNE is represented on the Advisory Board of MAEASaM (Mapping Africa’s Endangered Archaeological Sites and Monuments),¹⁶ and is promoting the ARIADNE approach to aggregation, and advising on sustainability, increasing the connections between ARIADNEplus and projects funded by the ARCADIA charitable foundation, which supports heritage data gathering and documentation projects in Africa, Asia, and the Middle East.¹⁷ Since the last deliverable, members of the Board of Directors have also given keynote addresses to Open Science conferences in India, Japan, and South Korea, promoting the ARIADNEplus vision.

¹⁵ <http://archsynth.org/>

¹⁶ <https://maeasam.org/>

¹⁷ <https://www.arcadiafund.org.uk/>

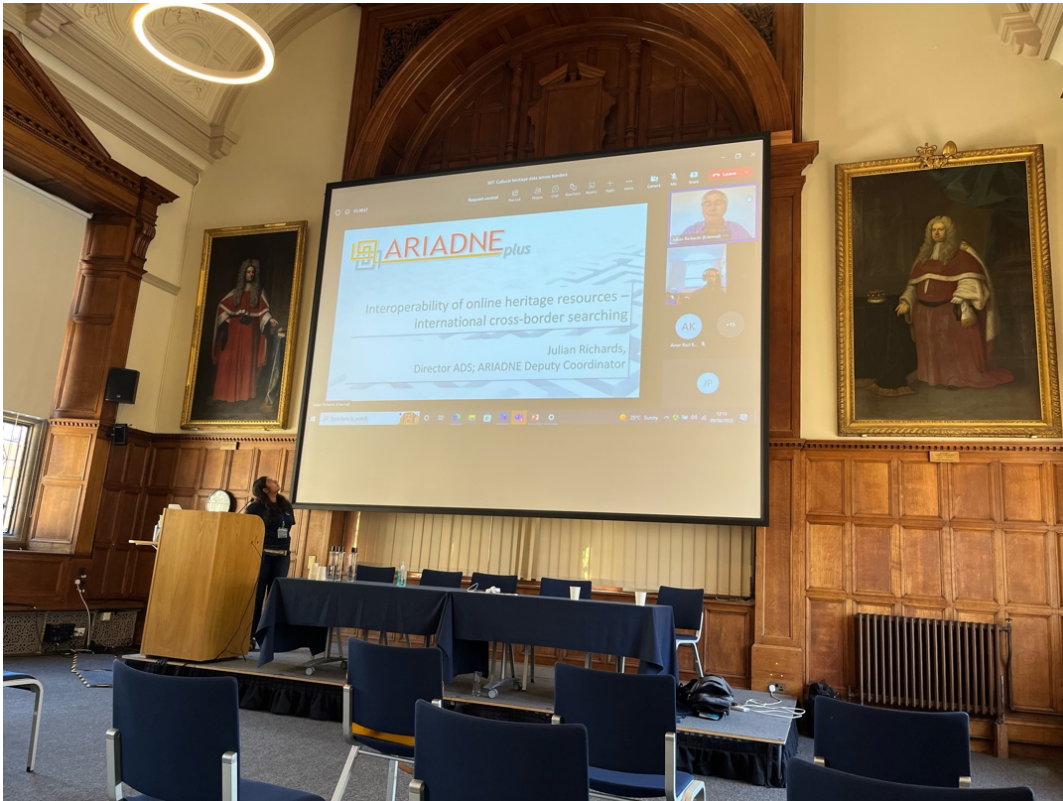


Figure 7: Presentation on ARIADNEplus at the Computer Applications in Archaeology International Meeting hosted in Oxford University, UK, 9 August 2022, in a hybrid session organised by a consortium of ARCADIA-funded projects entitled “Cultural heritage data across borders: Web-based management platforms for immovable cultural heritage in the global south”

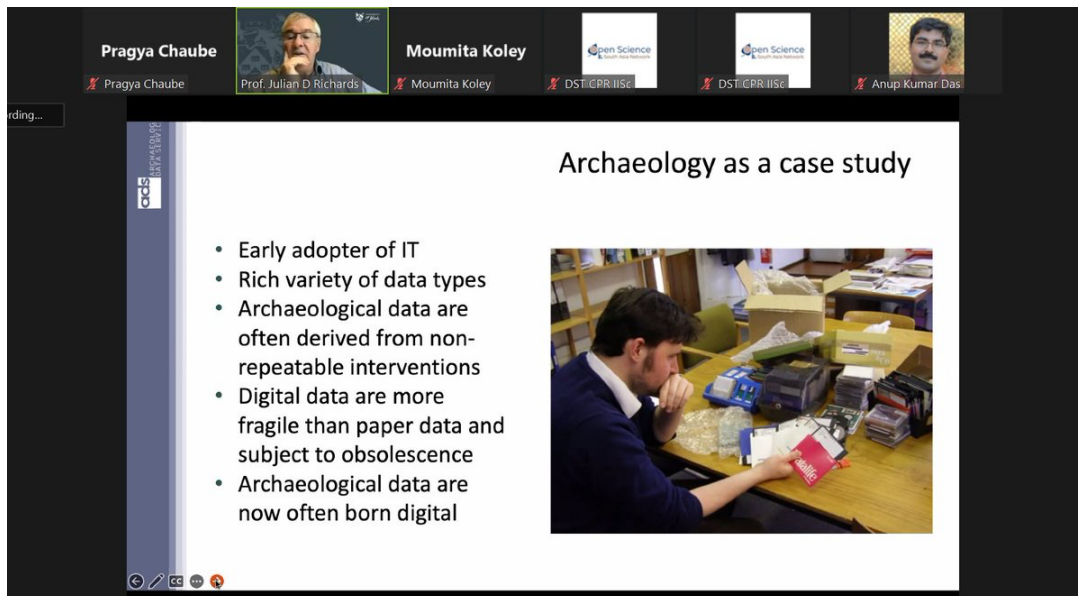


Figure 8: Presentation on Archaeology and ARIADNEplus to the online conference of the Open Science South Asia Network, hosted by Bangalore, India, 6 September 2022

9 Conclusions

For WP2, 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. ARIADNEplus partners have met regularly, 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. We have successfully extended the ARIADNE community and instilled a great sense of shared purpose.

Inviting all partners to attend Steering Committee meetings and introduction of the VRE use case workshops have each provided an invaluable means of engaging the large consortium membership with ARIADNEplus. The large interest in engaging with ARIADNE was not anticipated in the initial work plan but has been accommodated through the category of Associate membership.

The introduction of Associate partners has been a great success and has enlarged the ARIADNE community by another 17 organisations, contributing some significant additional online research resources and at least 24 person months of unpaid effort. That so many organisations have wanted to join ARIADNEplus, and been willing to commit time and resources to it is a great indication of the sustainability of the infrastructure. The aggregation of data from other international initiatives is a particular highlight, notably from ROCEEH and THANADOS, providing a broader interdisciplinary research context for their own datasets.

Other organisations have not joined as formal Associate partners, but have invested time and staff resource in working with an ARIADNE partner to provide access to their own data. For example, Historic Environment Scotland, Historic England, and the Portable Antiquities Scheme at the British Museum have been enthusiastic about using the ARIADNE portal to provide a way for researchers to access their own rich research resources.

It is also noteworthy that several of the European schools abroad, including French and British schools based in Athens and Ankara have been keen to participate. These schools often lack IT resources but sit on massive archaeological legacy archives. They are obvious targets for capacity building and data sharing. Similarly, our emphasis on south-eastern Europe has attracted associate partners in countries such as North Macedonia, Serbia, Croatia and the Slovak Republic, where there has been little previous tradition of open access to research data in archaeology and heritage. Many Associate partners have emphasised that joining ARIADNEplus has had a significant impact on their internal processes.

In conclusion, within the project lifetime ARIADNE has become established as a major component of the European e-infrastructure landscape. It is certainly the largest research data aggregator within the Arts and Humanities, and a significant player across all disciplines. This leaves us with confidence for the future sustainability of ARIADNE, and in the last few months of the current funded project we are exploring the best options to maintain the community we have established.