



## **D8.1 Quantity of Access Offered -TA1**

**Version 1.0 (Final)**

**Date 23 December 2022**

<b>Grant Agreement number:</b>	<b>823914</b>
<b>Project acronym:</b>	<b>ARIADNEplus</b>
<b>Project title:</b>	<b>Advanced Research Infrastructure for Archaeological Dataset Networking in Europe – plus</b>
<b>Funding Scheme:</b>	<b>H2020-INFRAIA-2018-1</b>
<b>Project co-ordinator name, Title and Organisation:</b>	<b>Prof. Franco Niccolucci, PIN Scrl - Polo Universitario "Città di Prato"</b>
<b>Tel:</b>	<b>+39 0574 602578</b>
<b>E-mail:</b>	<b>franco.niccolucci@pin.unifi.it</b>
<b>Project website address:</b>	<b><a href="http://www.ariadne-infrastructure.eu">www.ariadne-infrastructure.eu</a></b>

The research leading to these results has received funding from the European Community's Horizon 2020 Programme (H2020-INFRAIA-2018-1) under grant agreement n° 823914.

Authors: **Sheena Bassett, Achille Felicetti**

**PIN**

Quality Control **Paola Ronzino, PIN**

### **Document History**

- 02.12.2022 – Draft Version 0.1
- 12.12.2022 – Final version 1.0
- 17.12.2022 – Quality Control
- 22.12.2022 – Final version

This work is licensed under the Creative Commons CC-BY License. To view a copy of the license, visit <https://creativecommons.org/licenses/by/4.0/>

# Table of Contents

<b>1</b>	<b>Executive Summary</b>	<b>5</b>
<b>2</b>	<b>Introduction and Objectives</b>	<b>6</b>
2.1	About the Transnational Access Training Programme	6
2.2	Ensuring the quality of candidates	6
2.3	Mapping existing datasets to CIDOC CRM objectives	7
<b>3</b>	<b>TNA Dissemination, evaluation and offers</b>	<b>8</b>
3.1	The first TNA Call	8
3.2	The second TNA call	9
<b>4</b>	<b>Candidate projects</b>	<b>11</b>
4.1	Mapping existing datasets to CIDOC CRM (2020)	11
4.2	Mapping existing datasets to CIDOC CRM Summer School (2022)	11
<b>5</b>	<b>Overview of training provided</b>	<b>17</b>
5.1	Mapping existing datasets to CIDOC CRM (2020)	17
5.2	Mapping existing datasets to CIDOC CRM Summer School	17
<b>6</b>	<b>Evaluation of the Feedback</b>	<b>20</b>
6.1	Mapping existing datasets to CIDOC CRM (2020)	20
6.2	Mapping existing datasets to CIDOC CRM Summer School (2022)	20
<b>7</b>	<b>Conclusions</b>	<b>22</b>
	<b>Annex A - Application form</b>	<b>23</b>
	<b>Annex B - Guidelines for TNA Evaluators</b>	<b>27</b>

# 1 Executive Summary

This deliverable describes the Trans National Access (TNA) activities carried out during the ARIADNEplus project within Work Package 8 (WP8) by PIN and describes the results achieved by this work package. PIN were responsible for the delivery of TNA entitled “Mapping Existing Datasets to CIDOC-CRM” at their premises in Prato, Italy. The first call went out in 2019 and one person was able to complete their in-house training before the pandemic restrictions stopped travel. No further activities could be undertaken until 2021, after the easing of the COVID-19 restrictions, when it was decided to organise the TNA as four Summer Schools and all previously accepted applicants were offered (and took up) places on the week-long courses.

All candidates had to send in application forms describing their projects and how these would benefit from the use of CIDOC CRM. One of three independent reviewers evaluated the applications and awarded a mark and recommendation to ensure the quality and relevance of the training for the applicants. Only two applications were rejected, one being incomplete and one not aligned to the course on offer.

The training had to address a wide range of interests as well as varying levels of knowledge, the project descriptions demonstrating the need for interoperability and future reuse of data. Only one student managed to attend their in-house TNA before the COVID-19 restrictions came in and the training enabled her to start work on a possible future CIDOC CRM extension for the encoding of graffiti information.

The main purpose of this TNA Summer School was to introduce the 13 participants to ontologies, in particular those of the CIDOC CRM family, and to other standards for encoding information generated in the field of cultural heritage, in order to make them understand the importance of using these tools to make their archives standardised, semantically rich and ready to be integrated and made interoperable with similar information coming from different databases, with the course structured accordingly.

Finally, each student was asked to complete feedbacks forms after completing their TNA placements. The student who attended in 2020 was very satisfied with her training which was obviously targeted towards her specific research requirements. Some of the students on the Summer School mentioned that they found the 3M Mapping Tool difficult to learn to use and would have liked more time which is understandable, as this is acknowledged (but they do have access to the tool and support after completing their TNA training). Other issues mentioned related specifically to individual projects (e.g. data format conversion) – one suggestion to send out a pre-attendance questionnaire could definitely be useful for future training of this kind.

Overall, the students were happy with their training, one comment being: “It is a great program and I feel lucky to be part of it.”. The training objectives were achieved and 14 of the 15 training places on offer were taken up despite the pandemic halting all TNA activities for two years.

## 2 Introduction and Objectives

### 2.1 About the Transnational Access Training Programme

The ARIADNEplus TNA Training Programme was originally planned as up to three annual calls for individual/team training for:

- Mapping Existing Datasets to CIDOC-CRM (at PIN, Prato, Italy), and
- Individual training: Data Stewardship (UoY ADS, York, UK).

The first of these calls was issued in September 2019 with visits by candidates planned for between January and June 2020, with subsequent calls to be issued in 2020 and 2021 until the maximum capacity on each course had been reached. This was 15 user weeks (75 days) for PIN and 7 user weeks (35 days) for ADS.

Two further courses were offered as week-long Summer Schools by CNR, Pisa, Italy:

- Visual Media for the Documentation of Fieldwork and Artefacts, and
- Implementing Interoperability.

The Summer Schools were planned for 2021 with the expectation (based upon previous experience) that most of the places offered, 10 and 15 weeks, respectively, were likely to be taken up in one year but with the contingency that a second set could be offered in 2022 if not.

However, the global COVID-19 pandemic and national lock-downs severely disrupted the TNA Programme as travel was restricted from spring 2020 and the situation only began to improve in 2021 with the roll-out of national vaccination programmes and reduced restrictions which allowed people to start travelling again. Consequently, the programme was revised to allow as many as possible researchers to apply and attend. All training was offered as four Summer Schools between May and July 2022 with first priority given to previously accepted applicants who were unable to attend their original placements.

### 2.2 Ensuring the quality of candidates

In order to provide quality training, the students attending the TNA courses had to be suitably qualified and undertaking relevant projects and research. All candidates had to send in application forms (See Annex A) describing their projects and how these would benefit from the use of CIDOC CRM. Consequently, an independent panel of three external experts was formed and the applications from each student sent to a member of the panel for review and evaluation. The external evaluators were:

- Milica Tapavički-Ilić, Institute of Archaeology, Belgrade, Serbia
- Ivana Pandzic, University of Banja Luka, Bosnia Herzegovina
- David Bibby, Heritage Office, Stuttgart, Germany.

One of three independent reviewers evaluated the applications and awarded a mark and recommendation to ensure the quality and relevance of the training for the applicants. In addition, three senior ARIADNEplus members involved in the TNA delivery also received the applications and evaluations to ensure they agreed with the recommendations. Only two applications were rejected, one being incomplete and one not aligned to the course on offer.

The three external evaluators were provided with a set of guidelines (see Annex B) for performing this task, each returning a written summary for the candidates they were asked to assess.

## 2.3 Mapping existing datasets to CIDOC CRM objectives

*Mapping existing datasets to CIDOC CRM* was originally offered by PIN as individual/team placements as part of the TNA Training Programme.

### Work Package objectives

- To provide support in dataset design and implementation,
- To provide support for the integration and interoperability of legacy datasets.

The goal of this TNA was to enable researchers and professionals to map their datasets to the CIDOC CRM standard, an exercise required to integrate them into a wider framework such as the ARIADNE Infrastructure. The transnational access to PIN's facilities provided a summary background of CIDOC CRM, showing some case studies and some frequently used templates (e.g. for chronology, authorship, locations, etc.). The remaining time was dedicated to developing the mappings of students' case studies, which was carried out under the supervision of specialists. As a pre-requisite, some knowledge of CIDOC CRM was required.



Figure 1. Achille Felicetti with Mia Trentin at PIN working on CIDOC CRM mappings



### 3 TNA Dissemination, evaluation and offers

#### 3.1 The first TNA Call

The first call went out in September 2019 and widely disseminated over Social Media (Twitter, Facebook) and through the partners own dissemination channels. A leaflet was also prepared and partners asked to take these to events they organised or attended.

**ARIADNEplus**

**Trans-National Access for Archaeologists**

ARIADNEplus provides Trans-National Access (TNA) to archaeological researchers to enable them to create, manage, integrate and optimise their datasets and documentation and to participate in the use of research infrastructures. TNA is tailored to address specific research questions and projects for in-house placements and also provides training and support via two annual summer schools that cover the topics of dataset design and multimedia documentation.

**In-house placements for individuals and small groups**

In-house placements (normally one week in duration) are designed to give TNA participants support and training on the relevant activities needed for best practices associated with datasets:

- Mapping Existing datasets to CIDOC-CRM hosted by PIN, Prato, Italy
- Stewardship and Curation of Archaeological Data hosted by the Archaeology Data Service (ADS) University of York, UK

**Summer Schools**

These week-long Summer Schools, hosted by CNR-ISTI, Pisa, Italy, are held June-July and aim at providing students with expert guidance and the skills and knowledge on the specific topics covered. Access to tools and services on-site help each participant progress with their specific project:

- Dataset Design & Management
- Visual Media for the Documentation of Fieldwork & Artefacts

**How to apply**

Calls will be made from September 2019 every six months until March 2022 inviting candidates to apply. All information and the online form will be published on the ARIADNEplus website: <https://ariadne-infrastructure.eu/transnational-access>

Priority will be given to:

- users who have not previously used the ARIADNEplus resources
- young researchers
- researchers working in countries where no such research facilities exist

Each application will be reviewed by a Selection Panel who will recommend which candidates are to be offered places.

Successful candidates will be awarded bursaries to cover the costs of travel and subsistence.

Further information regarding the TNA content, eligibility and the application procedure are to be found on the website.

ARIADNEplus is a project funded by the European Commission under the H2020 Programme, contract no. H2020-INFRAIA-2018-1-823914.

@ARIADNEplus  
[www.ariadne-infrastructure.eu](http://www.ariadne-infrastructure.eu)

Figure 2. The TNA Leaflet

Application forms and detailed information about the application procedure were provided on the ARIADNE Infrastructure (<https://ariadne-infrastructure.eu/tna-2019-call-for-access-visits-pin-and-ads/>).

Eight applications were received and sent to members of the external Evaluation Team for review and feedback. Five of the applications came from a team of researchers based at INRAP. The results of the evaluations were as follows:



Name	Institute	Country
Avgousti Avgoustinos	CYI	Cyprus
Mia Trentin	CYI	Cyprus
Nurdan Atalan	British Institute at Ankara	Turkey
Yoann Pascal, Emeline le Goff, Thomas Guillemard, Julie Boudry, Stéphane Alix	INRAP	France

All the candidates were accepted for training and offered places.

Unfortunately, only one of the candidates was able to attend their training course before March 2020, this being Mia Trentin.

### 3.2 The second TNA call

The second TNA call for the Summer Schools was issued mid-February 2022 (<https://ariadne-infrastructure.eu/summer-schools-2022/>). These were as follows:

- Data Stewardship – ADS, University of York, UK. Online on Wednesdays 4th, 11th, 18th, 25th May and 1st June 2022.
- Mapping Existing Datasets to CIDOC CRM – PIN Scrl., Prato, Tuscany, Italy. Monday 20th–Friday 24th June 2022.
- Visual Media for the Documentation of Fieldwork and Artefacts – CNR, Pisa, Italy. Monday 27th June–Friday 1st July 2022.
- Implementing Interoperability – CNR, Pisa, Italy. Monday 4th–Friday 8th July 2022.

All four Summer Schools were promoted through the usual channels and also on the DARIAH Digital Humanities Course Register. At the same time, all the previously accepted candidates who had not received their training were contacted and asked if they would like to attend the corresponding Summer School instead.

For the *Mapping Existing Datasets to CIDOC CRM* Summer School held at PIN, there were 13 candidates of which five were previous applicants for the 2020 TNA training and one was a replacement person in the INRAP team.

Name	Institution	Status
Nurdan Atalan Çayırezmez	British Institute at Ankara	Confirmed (transfer from 2020)
Avgoustinos Avgousti	CYI	Confirmed (transfer from 2020)
Thomas Guillemard	INRAP	Confirmed (transfer from 2020)
Ann Moreau	INRAP	Replaces Emeline Le Goff
Stéphane Alix	INRAP	Confirmed (transfer from 2020)
Yoann Pascal	INRAP	Confirmed (transfer from 2020)

The remaining seven students were all new whose applications were each evaluated as before. All were accepted and offered places.

Name	Institute	Country
Diego Machado	University of Minho	Portugal
Marina Mateou	CYI	Cyprus
Vera Moitinho Almeida	University of Porto	Portugal
Tuuli Kurisoo	University of Tallinn	Finland
Elena González Gracia	University of Seville	Spain
Silvia Gomez	University of Vienna	Austria
Jona Schlegel*	University of Vienna	Austria

\* Late application which was approved by Dr. Achille Felicetti.

In total, 14 places out of 15 available for PIN were taken up. This is a very reasonable result considering that no TNA took place for two years out of the four available.

## 4 Candidate projects

This section provides an overview of each of the candidates' proposed projects as outlined in their application forms in order to illustrate the variety of applications being catered for and the specific interests covered.

### 4.1 Mapping existing datasets to CIDOC CRM (2020)

#### **GRAffiti MEditerranean DIAlogue - Visual and verbal communication in the Medieval and Modern Adriatic and Eastern Mediterranean (Mia Trentin)**

GRAFMEDIA aims to document and study graffiti in a wide context in order to establish a new methodology, already tested, but, principally, to trace visual and verbal models of communications and the making of a shared visual culture within societies of the Eastern Mediterranean area between 14th and 18th century.

- The first Research Objective (RO1) is the documentation of graffiti in the following selected sites chosen on the basis of historical sources (commercial documents and travel itineraries) and their nature of ports. They were all used by Venetian ships between 14th and 18th centuries, and they present different socio-cultural and political characteristics, which will ensure a multicultural frame for the case study.
- The second Research Objective (RO2) is the development and implementation of a novel cross-disciplinary methodology for the systematic study, analysis and data organization of graffiti enhanced through the use of innovative technological tools thanks to the expertise and collaboration of APAC-STARC team members.

### 4.2 Mapping existing datasets to CIDOC CRM Summer School (2022)

#### **Mapping field recording database to CIDOC CRM (INRAP team)**

The French National Institute for Preventative Archaeological Research carries out more than 1,700 archaeological operations per year. A considerable amount of field data is thus created and recorded by the Institute's teams. The data is massively recorder managed locally in digital format in field recording systems. A variety of databases and tools are used by the INRAP teams. In order to supply the ARIADNE Infrastructure with the reporting of this unpublished data, these systems must be made more interoperable in accordance with international standards. The participation of a group of archaeologists from the Institute who manage a series of these systems is intended to advance this data-sharing objective. Mapping these systems with CIDOC CRM will open the way for the sharing of a body of archaeological field data that is unique in the world in terms of volume.

### **Using CIDOC CRM for photography collections and archaeological data: case study BIAA Collections (Nurdan Atalan Çayırezmez)**

The project aims to understand the CIDOC CRM for photography collection and archaeological data using British Institute at Ankara (BIAA) Collections. BIAA has a library, collections and archaeological excavation archives. BIAA also has biocultural collections (seed, herbarium, wood and charcoal reference collections, animal bone reference collection, archaeobotanical and archaeo-zoological samples), pottery collection, squeeze collection, photography collection, maps, plans and drawings, excavation notes. BIAA has been digitising the collections since 2000's. At the end of 2018, the Digital Repository Office started to analyse the old digitised files and database and trying to adapt the standards for these collections. BIAA is working on a grant on digitisation project for herbarium and seed collections including photography collection. The idea is to link the data and make it available using international standards. Collections are online and searchable from [www.biaatr.org](http://www.biaatr.org). An updated version of the photographic database will be available soon. The idea is to learn CIDOC CRM, before building a digital repository for archaeological data.

### **EpHEMERA project (Avgousti Avgoustinos)**

Responding to the principles of the World Heritage Convention as well as to the Charter on the Preservation of Digital Heritage, this multidisciplinary project, which involves archaeologists, art historians, conservators and computer scientists, aims to create an open access, 3D interactive online geo-database of endangered architectural and archaeological heritage in the South Eastern Mediterranean basin; a region of tremendous cultural importance whose rich heritage is unfortunately threatened by both natural and human factors. A wide range of 3D modelling and topographic techniques have been applied to create accurate reconstructions of heritage sites, enriched by an extensive array of metadata.

The Online 3D Database System for Endangered architectural and archaeological Heritage in the south Eastern MEediterRAnea area (EpHEMERA) is intended to serve as an infrastructure where it is possible to:

- Visualize online and through standard web browser 3D architectural and archaeological models classified according to a specific type of risk;
- Query the database system and retrieve metadata attached to each single virtual object;
- Extract geometric and morphological information.

At present, the content of EpHEMERA lives in isolated data silos. Our aim is to be able to publish data in both human and machine understandable format. The way to achieve this is through the use of the CIDOC CRM.

### **From Bracara to Braga: Economic and social dynamics between the 3rd and 15th centuries: an archaeological approach (Diego Machado)**

This work focuses on the valorization of ceramic and numismatic materials, in order to approach the economy and society of the city of Braga, between the beginning of Late Antiquity and the end of the Middle Ages, using material culture as the primary source for the construction of historical discourse in the long term. The technological and economic approach of ceramics will enable us to

understand the development of production and commercial exchanges between the 3rd and 15th centuries, taking advantage of criteria such as formal and productive variability, pertinent indicators of economic and socio-cultural reality, resulting from technical innovation and the evolution of customs and tastes. The crossing of these data with the monetary circulation will allow an interpretation of the socio-economic evolution of the city, susceptible of contributing new and innovative knowledge, concerning the organization of work, the production chains and trade, and demonstrate the potential of material culture as a privileged source of history.

A specific part of the project's objectives is, therefore, focused on the classification and study of coins from contexts relevant to our research, which will result in the elaboration of a corpus of Roman and medieval coins that will be integrated in the Information System of the Archaeology Unit of the University of Minho (2ArchIS) and made available online at DataRepositóriUM, in order to produce an analysis of monetary circulation between the 3rd and 15th centuries, as well as the graphic elements associated with this component.

The opportunity to attend the TNA will fulfil two objectives: validate and consolidate the data register used at UAUM, in the 2ArchIS system, and move forward in the fulfilment of the cooperation protocol with the ARIADNEplus project, where we proposed to integrate in the ARIADNE Infrastructure the Roman Coins data sets from the Casa da Bica and from the Seminary S. Pedro, S. Paulo and PIO XII Museum.

#### **Nicosia, one of the last divided cities (Marina Mateou)**

This project aims to bring the lost historical culture heritage of Nicosia to the younger generation who have no memory of the city before it was divided after the war in 1974. It will build a platform for recording information about historical places and unexplored corners and end users will be able to explore the city via a game on their mobile phones using geo-location. The ultimate aim is the build up a community who can share their photos, letters, videos etc. and contribute to storytelling about the old city of Nicosia. CIDOC CRM will provide a framework for documenting the information.

#### **Mapping a 3D archaeological pottery database to CIDOC-CRM (Vera Moitinho Almeida)**

The aim of this project is to develop the mapping of existing 3D archaeological pottery datasets from collections in Portugal (ongoing project for a museum exhibition) and the ODEEG project (concluded) to the CIDOC CRM standard, namely to integrate them into a wider framework such as the ARIADNE Infrastructure.

Some of the potentialities of working with 3D digital data in archaeology are already well-known. The number of online databases providing open-access to 3D datasets and aggregators linking to 3D open data of CH objects for research has increased in the last decades. Concerning online databases with 3D models of ancient pottery, low resolution models are typically available, possibly mainly for fast visualisation purposes. However, crucial data, such as, raw data, high-resolution data, and corresponding technical metadata – also for repeatability and reproducibility of the data, much needed for a rapidly growing number of scientific works – seems to be overall neglected.

At the end, the goal is to provide a wide variety of meaningful, searchable, citable, and reusable data for researchers. This is to say, a solid basis for distinct types of archaeological and other scientific

research including, but not limited to: chronological and regional differentiation of vessel shapes, dimensions, and capacities; pottery manufacturing and function; ancient measuring systems; as well as knowledge, cultural, social, and economical networks.

**Main project: Metal-detected past: a study of long-term developments in settlement patterns, technology and visual culture on the example of metal-detector finds from Estonia (acronym MetDect) and Complementary project: Atlas of the Estonian metal-detector finds and mapping the ontologies of metal-detector finds (acronym EDAO) (Tuuli Kurisoo)**

MetDect examines long-term developments in the settlement patterns, local production of ornaments and visual culture by using metal-detector finds from Estonia. Despite the inherent limitation of the data (uneven level of contextual and empirical information), MetDect will demonstrate that the vast amount of metal-detector finds will significantly advance our current knowledge about the past. Unlike many other studies, this project focuses on the full variability of detected-artefacts in a long temporal scale (1800BCE–1800CE). MetDect will use a combination of methods drawn from humanities and natural sciences for investigating each topic. Settlement patterns and workshop areas will be examined by using GIS mapping and spatial analysis (e.g., point-pattern analysis), but production series of ornaments will be distinguished stylistically. Local production of ornaments is further examined by determining chemical composition (bulk alloy and trace elements) of selected production series. Lastly, new types and form variations of artefacts that are discovered by private detectorists will be compared with other visual sources (architectural and artefactual) in order to discuss circulation of ideas related to cross symbolism. MetDect will launch the first open-access database on metal-detector finds in the Eastern Baltic. Further, the results of this project will provide an important contribution to a wider debate regarding the usage of metal detectors by private persons. As such, MetDect offers a novel and ambitious research programme for studying metal-detector finds in the Baltic Sea area and beyond.

The data of the EDAO project comes from the MetDect project that studies metal-detector finds from Estonia. The aims of the EDAO are threefold 1) to map the ontologies of metal-detector finds to the CIDOC CRM standard\* and to compare Estonian dataset with similar datasets in Europe; 2) to develop the terminology of archaeological finds further and to make explanatory charts of the main artefact typologies; 3) to create web-based Atlas of the Estonian metal-detector finds. The Atlas of the Estonian metal-detector finds will be the first publicly accessible map application that allows looking up archaeological finds from a particular region of Estonia.

**The Analysis of Architectural Heritage through Graphic Documents: The Archaeological Site of Italica (Seville, Spain) - From the 16th to the 21st Century. (Elena González Gracia)**

The aim of this research is to verify the relationship between the graphic expressions employed in each period, the tools used and the concept of contemporaneous heritage, and how this impacted not only the actions undertaken for the knowledge and conservation of that heritage, but also the construction of an administrative and legal framework for its protection. The purpose of these retrospective analyses is to reach an understanding of the increasing role that is played today by the new means of digital tools and resources—specifically, digital information models—and its effect on our perception of heritage.

For our case study we have chosen the ruins of the Roman city of Itálica, which has been present since the 16th century in the imagery and collective memory of Seville; from the first drawings made

by Anton van der Wyngaerde, the engravings and vistas of the amphitheater and the countless drawings created by the archaeologists and architects who have carried out interventions in the ruins, to the digital models of today and the numerous virtual realities that inundate social media.

The aim of the work was to reconstruct the graphic heritage of the archaeological site of Italica by collecting and analysing the “models” that have been generated about the site (in this case, “model” is used in its broadest sense as an abstraction or conceptualisation of a complex reality that deliberately omits certain aspects of that reality to focus on what we are interested in revealing or understanding as observers and analysts).

This research will enable us to relate knowledge with graphic and architectural knowledge and to determine the intentions at the time, as well as the relationships which emerge between the techniques applied and the different ways of thinking and acting. In addition, it will also show us a chronology of the periods in which the different properties of the Italica site aroused the interest of the scientific community, the society of the time and the agents that promoted its study. These data may be useful for evaluating, from our present perspective, the effects and consequences of the use of new digital information models today. We address this through models such as databases, graphs models and digital systems that permit multiple relations across different networks.

The goal is to map the database and the graph model of this research to the CIDOC CRM standard in order to contribute a shared understanding of cultural heritage information by using a common and extensible semantic framework.

### **Settlements and Space in Egypt and the Near East during the end of the Early Bronze Age and the Middle Bronze Age. An aoristic approach (Silvia Gomez)**

My research focuses on the study of settlements and space in Ancient Egypt and the Near East during the periods known as Early Bronze III and IV (c. 2500 – 2100 BC) and the Middle Bronze Age (c. 2100 – 1600 BC). During these times, population dynamics are constantly changing due to migratory movements and climatic events like droughts, resulting in frequent settlement abandonments and reoccupations in apparent short periods of time. It is also at the end of this period (ca. 1800 BC) when newcomers settle for good and in a seemingly larger quantity than before in Egypt, especially in the Eastern Nile Delta.

One of my research goals is to aim for a proper integration of digital tools. First, I study and classify house-types and settlement structure in the area using Geographical Information Systems, where I insert specific georeferencing information as well as chronology and plans. The creation of a landscape study is essential to understand population dynamics and changing patterns in the long run.

The data compiled and georeferenced in the GIS database will be integrated afterwards into R-software. The aim of introducing this method is to run an aoristic analysis that will produce a statistical distribution of house-types by centuries. This procedure allows for filling the gaps where there is scarce to nonarchaeological record: it creates a statistical model of how the distribution of house-types would look like in the periods for which there is no information (except for the cases we know there is destruction or a particular event signalling “null” presence) according to the results we already have.



A successful integration into R necessitates of a tidy and organized database. I have experience with archaeological databases, and I am very interested in creating one that is equipped with a proper ontology that will allow the accessibility of my research to a greater audience, while keeping the metadata available for future researchers that wish to broaden this subject. I am at this point in my research, so I consider that CIDOC CRM will provide me with the necessary tools to be able to create such structure and will greatly improve my current database.

### **Spatiotemporal analysis of graffiti and street art using the CIDOC CRM and the Harris matrix (Jona Schlegel)**

The aim of this project is to research into how time and space are stored, managed, queried and visualised in the archaeological context and how this can be applied to other fields like graffiti and street art, drawing on the data and work structure of the project INDIGO (IN-ventory and DI-ssamination DO-naukanal) in Vienna, Austria.

The material archaeologists' study was created in the past but is excavated, uncovered and in existence in the present. This means that archaeologists are working with mere data traces from the past, but the interpretation and analysis happen in the present by people from the present (Lucas and Olivier 2021). So, using a case study like the Danube channel in Vienna, Austria, an active cultural landscape – a graffiti scape – enables us to study a growing stratification. The channel and its surroundings are a recreation area frequented by younger people and a hot spot for the graffiti scene. New graffiti are sprayed, painted, scratched, and scribbled on the walls every day. They can carry a message, like an announcement for a demonstration or the name of the graffitist.

Information like the approximate time of creating the graffiti, the time of recording and the time interval of data processing should be stored. Next to the storing of the process information, the functionality of answering spatiotemporal related questions is quite relevant in this project. So, we want to know which graffitists are the most active and where are the more frequented areas. Furthermore, we want to see if certain graffitists have the tendency to cover up the same graffitist often.

To ask a dataset these kinds of questions, a well-structured database system must be used, which in the case of project INDIGO is OpenATLAS. OpenATLAS uses CIDOC CRM in the database, but it is developed through projects focused on coins and history (Eichert 2018, <https://openatlas.eu/>). So, one aspect is to bring in the parts of the CIDOC CRM into OpenATLAS that represent INDIGO and the graffiti culture. Furthermore, the stored data will be visualised on a three-dimensional online platform. This will make the data and information accessible and publicly available.

## 5 Overview of training provided

### 5.1 Mapping existing datasets to CIDOC CRM (2020)

Mia Trentin's TNA was intended to provide her project with a solid ontological description for the study of Medieval and Modern graffiti. In fact, the lack of a shared model able to describe the constitutive elements of this domain makes integrating and sharing of this information very difficult.

The course tried to meet the need for a tool able to represent graffiti information using the classes and properties of the CIDOC CRM ecosystem and to define new and more domain-specific entities where necessary.

The CIDOC CRM ecosystem already provides an ontological tool (CRMtex) for encoding epigraphic data and incorporates many of the essential concepts for defining a graffiti model. Additionally, CIDOC CRM already provides all the semantic tools necessary for the description of generic entities, such as actors, places, objects, spatial and temporal entities. However, from the TNA discussion emerged the need to define a new extension to model the specific entities of the domain in order to harmonize these data with those encoded with the existing models.

The first part of Mia's TNA was thus devoted to the introduction to the CIDOC CRM ontology and its extensions, with particular attention to the aspects related to Mia's research. During the rest of the course, it was possible to start the definition of a specific ontological representation in CIDOC CRM-based of graffiti material and to define a preliminary version of a future extension for the encoding of graffiti information. The discussion contributed not only to create a semantic representation of graffiti and of all the entities involved in their study, but also to clarify and better define collateral aspects of Mia's research useful for the enrichment of graffiti information.

### 5.2 Mapping existing datasets to CIDOC CRM Summer School

The main purpose of this TNA Summer School was to introduce participants to ontologies, in particular those of the CIDOC CRM family, and to other standards for encoding information generated in the field of cultural heritage, in order to make them understand the importance of using these tools to make their archives standardised, semantically rich and ready to be integrated and made interoperable with similar information coming from different databases.

The course has been structured to provide a general overview of CIDOC CRM, the logic on which it is built and how to apply its classes and properties for data encoding. It also illustrated the importance of using thesauri, controlled vocabularies and gazetteers, to make standardization more solid, and provided real life examples taken from terminological tools commonly used in the world of cultural heritage, such as Getty AAT and PeriodO, to showcase their use and illustrate their benefits.

Some real examples of application of these conceptual models to various types of data, both in ARIADNEplus and in other contexts, have been illustrated and commented. The contribution of Nicola Amico, an expert in applications of ontological models to 3D, was fundamental and particularly appreciated in this context.

The course also focused on the analysis of the datasets of each of the participants and the definition of specific and dedicated strategies for the application of ontological models to the information they contain. Through a series of short tutorials, IT tools such as 3M, the Vocabulary Mapping Tool and the other tools used by ARIADNEplus, were then illustrated and put in practice. In this phase, Maria Theodoridou, the FORTH expert on the application of methods and tools for the implementation of CIDOC CRM, offered her valuable contribution by teaching, with real examples taken from ARIADNEplus activities, the functioning of the various tools and the techniques for their fruitful use.

Finally, all the participants had the opportunity, under the supervision of the specialist, to test the tools directly on their data to gain confidence and better understand how they work. This way, all participants had the possibility to implement data encoding and generate their information in RDF and Linked Open Data format, a fundamental experience since this allows them to use the same tools in their future activity, also beyond the specific purposes of the summer school, to extend their mappings for their interoperability needs.

The Summer School took place from 20 to 24 June 2022 in person at the PIN (Prato, Italy) with the following programme:

<b>Monday 20<sup>th</sup></b>  <b>Afternoon</b> 3:00pm-6:00pm	<b>Welcome and practical advice to participants</b>  <b>Overview of the CIDOC CRM ecosystem, <i>Achille Felicetti, PIN</i></b>
<b>Tuesday 21<sup>st</sup></b>  <b>Morning</b> 9:30am-1:00pm  <b>Afternoon</b> 3:00pm-6:00pm	<b>Presentation of participants' research</b>  Each participant had the opportunity to present her/his research (approx. 20 minutes per participant). Selection of the data to be used for the 3M tool practical demonstration on Thursday 23 <sup>rd</sup> .
<b>Wednesday 22<sup>nd</sup></b>  <b>Morning</b> 9:30am-1:00pm  <b>Afternoon</b> 3:00pm-6:00pm	<b>CIDOC CRM and Ontologies for 3D Semantic Data Modelling</b>  <i>Nicola Amico, PIN</i>  <b>Data Aggregation and Integration in the ARIADNEplus Project</b>  <i>Achille Felicetti, PIN</i>  <b>CIDOC CRM Extensions and Applications</b>

	<p>Various presentations covering different application areas of CIDOC CRM and its main extensions. Agreed with the participants according to their specific interests.</p> <p><i>Achille Felicetti, PIN</i></p>
<p><b>Thursday 23<sup>rd</sup></b></p> <p><b>Morning</b></p> <p>9:30am-1:00pm</p> <p><b>Afternoon</b></p> <p>3:00pm-6:00pm</p>	<p><b>CIDOC-CRM Mapping Strategies and Tools</b></p> <p>Presentation and demonstration of the 3M tool developed by FORTH (Greece) for mapping and converting data to CIDOC CRM.</p> <p><i>Maria Theodoridou, FORTH</i></p> <p><b>Hands-on Session. The 3M tool in action</b></p> <p>Test cases and practical application of the 3M tool using the participants' selected data.</p> <p><i>Maria Theodoridou, FORTH</i></p>
<p><b>Friday 24<sup>th</sup></b></p> <p><b>Morning</b></p> <p>9:30am-1:00pm</p>	<p>Lesson learned, questions and feedback from participants</p> <p>Evaluation of results and considerations.</p> <p>Final discussion and closing of the summer school.</p>

## 6 Evaluation of the Feedback

Each of the participants was required to complete a feedback form after they had completed their TNA training. The results of the feedback is summarised here for the individual visit and the Summer School.

### 6.1 Mapping existing datasets to CIDOC CRM (2020)

Only one candidate, Mia Trentin, managed to attend their TNA training course at PIN in 2020. Her feedback indicates that she was highly satisfied with her training and that it had more than met her requirements.

### 6.2 Mapping existing datasets to CIDOC CRM Summer School (2022)

Overall, everyone was happy with their training. One student wrote:

“I learned more about CIDOC CRM and ARIADNEplus. It was useful to meet new people and hear about other projects. Maria and Achille were helpful and supportive. Discussion helped me to understand the mapping structure for ARIADNE. CIDOC CRM information was also helpful for my PhD study.”

Some difficulties were encountered by a few of the students. The main one of these was learning to use the 3M Mapping Tool and having enough time to get familiar with it. Two of the students would have liked a second week of training, another suggested a longer Summer School. It is acknowledged that the tool does take some time to master, especially for people new to CIDOC CRM.

The students all have different levels of technical knowledge which can be challenging to cater for when teaching a group. As one student suggested, perhaps a pre-attendance questionnaire might help identify those students who would need more support and also help prepare examples that match the student’s research interests. One student reported difficulties with converting her spreadsheet to XML – unfortunately, the trainers have no idea what the student’s data looks like until they arrive at the Summer School. Maybe this could be something a pre-attendance questionnaire could ask about.

The responses are reported below, but anonymised for data protection reasons:

- On CIDOC-CRM summer school, maybe spend a little more time on practical use of 3M tool.
- It would be nice to organize local events. It would also be nice to have a translation of CIDOC CRM for other languages. It is difficult to understand and think in another language. Online organizations will be another option to reach the other countries.
- Recommend holding Winter Schools (i.e. not in high season of Summer for travel reasons). Hosting events in other places or universities.
- The only difficulties we encountered on this Summer School are those specifically associated with the use of the 3M Tool and the CIDOC CRM ontologies which are the very goal of the training. Maybe a longer summer school would be good for improving the training session of course.

- It was a very interesting and enriching Summer School, with very productive discussions. The trainers were always available to help and to answer questions. However, considering the complexity of the topics, perhaps the training would benefit from extending its duration 1 more week – i.e., a 2 week Summer School, where the 1st week would be as it was and the 2nd week completely hands-on, working with our own data (and with the support and discussions from experts and colleagues).
- To be honest, it was very difficult to follow the introductory part of the CIDOC CRM 3M Mapping Tool developed at FORTH. Perhaps more structured approach would have been more useful than creative ‘let’s try and see’ approach. The course description says that only general knowledge of CIDOC CRM is required for participating, but it was assumed that all the participants know how to make XML files, understand terms like XPATH etc. Perhaps these kinds of aspects should be also clearly formulated in the description of the TNA. In my opinion, it is very important to understand the target groups of the summer schools (what is their knowledge when it comes to a specific topic) and design the course accordingly. One way of achieving it could be pre-course questionnaire or something like that. It is always better to have a very structured approach when teaching new skills. I also believe that previously prepared and guided hands on session would be great idea for teaching practical skills. It helps to reduce a lot of confusion and gives everyone a change to try things out (and also the lecturers can be sure that the things they want to demonstrate are actually working as they should be).
- Difficulty in understanding some cases specifically focused on archaeology (archaeological terms, procedures, etc.) Dedicate more time to the practical part of the CIDOC CRM schema design. Show more examples / case studies focused on archaeological ruins (in addition to archaeological objects).
- In cases like this, where methodology to learn is intricate, I would like to be able to have a second week (optional, maybe, for participants) only for cementing the knowledge with some supervision! They did a great job and we learnt a lot, a practice week would be great.
- As the project I am working on is still gathering and structuring the data, it was difficult for me to have a usable spreadsheet and turn this into usable XML file that could be used with the 3M tool. A nice thing would be to provide potential hotels or other sleeping accommodations for the participants and also organize a first acquaintance meeting like a dinner or a lunch to meet everyone. Furthermore, it would have been great if a list of needed equipment, the data and a more detailed description of the purpose of the presentation would have been given. For me, that means clarifying the aim of the presentation and how the discussion will be done, if one needs a laptop to install new software or would be a working browser be enough and therefore a tablet would be totally fine, and how to structure the needed spreadsheet, and provide an XML file and an explanation on how to create an XML file based on a spreadsheet. Especially the last thing would have been a great improvement regarding the time spend more on actually working with the 3Mtool. It is a great program and I feel lucky to be part of it. Great would be to have a continuous exchange with all the participants. This could be in form of a forum, an e-mail exchange, or a newsletter, where updates and the achievements of the participants are posted.

## 7 Conclusions

It is unfortunate that the global pandemic disrupted the TNA training programme and that the majority of the students were not able to attend individual placements as these can be specifically tailored to their research requirements. The one student who went to PIN in 2020 was very appreciative of the training she received. As a means of providing as much training as possible in the final year with the resources available, all TNA was offered as Summer Schools. It is obviously a bit more difficult to meet everyone's needs when dealing with several different sets of requirements and levels of technical knowledge within a limited time period but overall everyone seemed satisfied that they had learnt enough from the course to apply it to their projects.

Some of the students provided constructive feedback for improving the Summer Schools which will be taken on board when organising similar training events in the future. For example, the pre-attendance questionnaire would have possibly helped with the selection of examples and also the issue with data formats of the student datasets. Note, that whilst it is acknowledged that the 3M mapping tool takes time to learn, the students have access to the tool after they have completed their training and can continue to learn to use it as well as ask their trainers any questions they may have. Overall, the students were happy with their training, one comment being: "It is a great program and I feel lucky to be part of it.". The training objectives were achieved and 14 of the 15 training places on offer were taken up despite the pandemic halting all TNA activities for two years.



## Annex A - Application form

The following is the TNA Application form for the Summer Schools, this is identical to the form used for the 2020 call apart from the section “ARIADNE Infrastructure access being applied for:”.

### ARIADNEplus Transnational Access Application form

To be sent to TNAcontact@ariadne-infrastructure.eu

Family Name		Nationality	
First Name		Birth year	
Gender ( <i>tick the appropriated item</i> ): <input type="checkbox"/> female <input type="checkbox"/> male			
Home Institution			
Legal Status of Home Institution Code <sup>1</sup>		Home Institution Country Code <sup>2</sup>	
Function / Job / Title		Position Code <sup>3</sup>	
Mailing Address			
Phone (office)		Phone (cell)	
Fax		E-mail	

#### **Short Biography** (*max 500 words*)

*Please provide details of your academic qualifications and experience in archaeological research*

*Note: If you want to provide additional information you can attach a separate file to your submission (file named “Add. Info”).*

<sup>1</sup> **UNI**=University, **RES**=Public Research Organisation, **SME**=Small or Medium Enterprise, **PRV**=Other and/or profit or not profit Private Organisation, **OTH**= Other Organisation

<sup>2</sup> **AL**=Albania, **AM**=Armenia, **AT**=Austria, **BA**=Bosnia and Herzegovina, **BE**=Belgium, **BG**=Bulgaria, **CY**=Cyprus, **CZ**=Czech Republic, **DK**=Denmark, **EE**=Estonia, **FO**=Faroe Islands, **FI**=Finland, **FR**=France, **GE**=Georgia, **DE**=Germany, **GR**=Greece, **HR**=Croatia, **HU**=Hungary, **IS**=Iceland, **IE**=Ireland, **IL**=Israel, **IT**=Italy, **LV**=Latvia, **LT**=Lithuania, **LU**=Luxembourg, **MT**=Malta, **MD**=Moldova, **ME**=Montenegro, **NL**=Netherlands, **MK**=North Macedonia, **NO**=Norway, **PL**=Poland, **PT**=Portugal, **RO**=Romania, **RS**=Serbia, **SK**=Slovakia, **SI**=Slovenia, **ES**=Spain, **SE**=Sweden, **CH**=Switzerland, **TN**=Tunisia, **TR**=Turkey, **UA**=Ukraine, **GB**=United Kingdom.

<sup>3</sup> **UND**=Undergraduate, **PGR**=Post graduate (student with a first University degree or equivalent), **PDOC**=Post-doc researcher, **TEC**=Technician, **EXP**=Experienced researcher (professional researcher).

<b>ARIADNE Infrastructure access being applied for:</b>
<p><b>Access is requested for the following summer school:</b></p> <p><input type="checkbox"/> Data Stewardship [<i>ADS, UK – Online Wednesdays 4<sup>th</sup> May-1<sup>st</sup> June</i>]</p> <p><input type="checkbox"/> Mapping Existing Datasets to CIDOC-CRM [<i>PIN, Italy 20<sup>th</sup>-24<sup>th</sup> June</i>]</p> <p><input type="checkbox"/> Visual Media for the Documentation of Fieldwork and Artefacts [<i>CNR, Italy 27<sup>th</sup> June-1<sup>st</sup> July</i>]</p> <p><input type="checkbox"/> Implementing Interoperability [<i>CNR, Italy 4<sup>th</sup>-8<sup>th</sup> July</i>]</p>
<p><b>Specific requests for preparation or training (optional)</b></p>

*Note: **Project title**, **Project objectives** and **Description of the planned work, and References** are intended to provide information on the research project in which applicants are currently engaged in and the specific project that they expect to work on during the TNA.*

<b>Project title:</b>
<b>Project objectives</b> (max 500 words)
<b>Description of the planned work</b> (max 2 pages, figures and tables included)

<p><b>Personal statement: expected achievements and impact</b> (max 500 words )</p> <p><i>Outline the reasons why you are interested in the TNA, what you wish to gain from it, and how you expect it to contribute to your own research project in the future.</i></p>
<p><b>Dissemination plans</b> (max 500 words )</p> <p><i>Describe how you plan to bring lessons learned in the TNA to the attention of members of your project team, academic department or organization, or the research community at large. This could be in the form an informal talk, a brief report, a blog post, or a publication.</i></p>
<p><b>References</b></p>
<p><b>Main scientific field of the project</b></p> <p><i>Give the particular field of research in your project, e.g., “Lithic technologies”, “Augustan iconography”, or “Archaeological gazetteers”.</i></p>

**Specific discipline**

*Give your disciplinary affiliation, e.g., "Classical archaeology", "Archival science" or "Museum studies".*

1. Request for ARIADNEplus sponsorship? ☐ Yes ☐ No
2. Any other EU project related to this proposal ? ☐ Yes ☐ No

In case of positive response, specify:

**3. How did you hear about ARIADNEplus?**

- ☐ Personal contact ☐ Web page ☐ Conference ☐ Twitter
- ☐ Article ☐ Other (*specify*)

I confirm that, I will send a Summary Report and complete the European Commission's User group questionnaire (if required) no later than two months after the end of the access visit or summer school, and that the results of the proposed project will be published specifying that the project leading to the publication has received funding from the European Horizon 2020 Programme : *"The research leading to these results has received funding from the European Commission Horizon 2020 Programme under Grant Agreement number: 823914 — ARIADNEplus — H2020-INFRAIA-2018-2020/H2020-INFRAIA-2018-1"*.

**Date** .....

**Signature**

.....

## Annex B - Guidelines for TNA Evaluators

The selection panel is responsible for:

- Assessing the proposals for transnational access received in response to open calls, based on the following selection criteria:
  - o Quality of the applicant,
  - o Scientific merit of the case study or individual research project proposed by the applicant,
  - o Potential benefit to the applicant from the training on offer.
- Applying the principles of transparency, fairness and impartiality to the selection process,
- Attending to gender equality.

Priority will be given to:

- Users who have not previously been awarded ARIADNE resources,
- Early career researchers,
- Researchers working in countries without comparable facilities/opportunities.

Each panel member should indicate his/her evaluation decision by indicating Accept/Reject on the application, providing a short explanation. For positive evaluations, priority should be expressed with a value from one to four (four being the highest score).

The Project Coordinator and the Deputy Coordinator will express the final decision, based on the selection criteria (see above).

Applications from researchers belonging to an ARIADNEplus partner institution are allowed and encouraged, unless they are based on the home country of the institution offering the TNA.

Eligibility criteria (to be checked by the TNA manager)

To be eligible for ARIADNEplus TNA funding, researchers need to comply with the following criteria:

- Work or be registered as a student in an institution in an EU Member State or an Associate State; researchers from institutions in the home country of the TNA opportunity are not eligible to receive an ARIADNEplus TNA bursary.
- Agree to provide feedback on TNA opportunity by:
  - o Completing an ARIADNEplus user report and returning it to [TNAcontact@ariadne-infrastructure.eu](mailto:TNAcontact@ariadne-infrastructure.eu),
  - o Completing the European Commission's User group questionnaire using the online form.
- Agree to their names being included in a list of ARIADNEplus TNA users provided to the European Commission and published in various media, including the Internet.
- Disseminate results obtained as a result of TNA access as widely as possible and provide ARIADNEplus with the details. Publications should include the following acknowledgement: The research leading to these results has received funding from the European Commission under the H2020 Programme, contract no. H2020-INFRAIA-2018-1-823914 (ARIADNEplus).