

# Deliverable 4.2

## Report on service deployment and training

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Deliverable Report n. 4.2: Final, issue date on 30th April

Grant Agreement number:	101004468
Project acronym:	4CH
Project title:	Competence Centre for the Conservation of Cultural Heritage
Funding Scheme:	H2020
Project coordinator:	Francesco Taccetti, INFN
Tel:	+39 3201806514
E-mail:	francesco.taccetti@fi.infn.it
Project website address:	<a href="http://www.4ch-project.eu">www.4ch-project.eu</a>

Title: D4.2 Report on service deployment and training

Issue Date: 30th April 2023

Produced by: UNIBO, DANS-KNAW

Main authors: Serena Orlandi (UNIBO) <https://orcid.org/0000-0003-0868-3080>  
Rossella Roversi (UNIBO) <https://orcid.org/0000-0002-6192-3437>  
Danila Longo (UNIBO) <https://orcid.org/0000-0002-7516-7556>  
Beatrice Turillazzi (UNIBO) <https://orcid.org/0000-0001-5864-2055>  
Pascal Flohr (DANS-KNAW), <https://orcid.org/0000-0003-3203-913X>  
René van Horik (DANS-KNAW) <https://orcid.org/0000-0001-6899-760X>  
Catherine Anne Cassidy (CARARE) <https://orcid.org/0000-0003-2771-4575>  
Kate Fernie (CARARE) <https://orcid.org/0000-0003-3733-0727>  
Vicky Dritsou (ATHENA) <https://orcid.org/0000-0001-8073-0035>

Co-authors: Achille Felicetti (PIN) <https://orcid.org/0000-0003-4733-3171>

Version: 0.1

Reviewed by: Roberto di Giulio (Scientific Coordinator of the 4CH Project), Achille Felicetti – WP4 leader (PIN)

Approved by: Francesco Taccetti (4CH Project Coordinator)

Dissemination: Public

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4CH is a Horizon 2020 project funded by the European Commission under Grant Agreement n.101004468 – 4CH.



## Document History

- 20.01.2023: Draft version 0.1
- 03.04.2023: Draft version 0.2
- 12.04.2023: Final version for internal review
- 27.04.2023: Revised version
- 30.04.2023: Final version

## List of acronyms and abbreviations

- 4CH: The 4CH Project for the Competence Centre on the Conservation of Cultural Heritage
- ADS: Archaeology Data Service
- AISBL: International Association of the European Heritage Network
- ARIADNEplus: Advanced Research Infrastructure for Archaeological Dataset Networking in Europe
- CARARE: Connecting Archaeology and Architecture in Europe
- CESSDA: Consortium of European Social Science Data Archives
- CC/CCs: Competence Centre/s
- CCR: Centro Conservazione e Restauro 'La Venaria Reale':
- CH: Cultural Heritage
- D: Deliverable (project)
- DC: Documentation Centre
- DCC: Digital Competence Centre
- DANS: Dutch National Centre of Expertise and Repository for Research Data
- DARIAH: Digital Research Infrastructure for the Arts and Humanities
- Discovery: The Discovery Programme
- DOI: Digital Object Identifier
- E-RIHS: European Research Infrastructure for Heritage Science
- EC: European Commission
- ECC: European Competence Centre
- ECCCH: European Collaborative Cloud for Cultural Heritage
- EOSC: The European Open Science Cloud
- ERIC: European Research Infrastructure Consortium
- EU: European Union
- EUDAT or EUDAT CDI: EU Collaborative Data Infrastructure
- FAIR: Findable, Accessible, Interoperable, Reusable
- GA: Grant Agreement
- H2020: Horizon 2020 EU Programme
- ICCU: Istituto Centrale per il Catalogo Unico delle Biblioteche Italiane e per le Informazioni
- NCC: National Coordination Centre
- NGOs: non-governmental organisation
- MOOCs: Massive Open Online Courses
- ORCID: Open Researcher and Contributor ID
- PIDs: Persistent identifiers



- RDA: Research Data Alliance
- Re3data: Registry of Research data Repositories
- RIR: Research Infrastructure and Resources
- ROR: Research Organization Registry
- SBN: Servizio bibliotecario nazionale (National Library Service, Italy)
- SSHOC: Social Sciences and Humanities Open Cloud
- SME: Small-Medium size enterprise
- T: Task (project)
- TeSS: Training eSupport System
- UML: Unified Modeling Language
- URL: Uniform Resource Locator
- WP: Work Package (project)

## Definitions

Term	Definition	Source
Advising	Giving advice or offering counsel or recommendations.	<a href="#">Art &amp; Architecture Thesaurus® Online</a>
Asynchronous training / learning	Self-paced learning, where the learner follows the training at their own pace. This can for example be done through an online static course, e.g. a moodle, or MOOC.	4CH
Capacity building, capacity development or capacity strengthening	Capacity refers to the ability of an individual, group, organisation or system to deliver intended outcomes, while capacity building refers to improving the ability of the entity to perform.	<a href="#">Brown L, LaFond A and Macintyre K (2001) Measuring Capacity Building. University of North Carolina</a>
Collaborative research	Research involving coordination between the researchers, institutions, organisations, and / or communities. Collaboration can be voluntary, consortia, federation, affiliation, and merger and can occur at five different levels: within disciplinary, interdisciplinary, multi-disciplinary, trans-disciplinary or national vs international. Collaborative research has the capabilities for exchanging ideas across disciplines, learning new skills, access to funding, higher quality of results, radical benefits, and personal factors.	<a href="#">Bansal S, Mahendiratta S, Kumar S, Sarma P, Prakash A, Medhi B. Collaborative research in modern era: Need and challenges. doi: 10.4103/ijp.IJP_394_19. PMID: 31391680; PMCID: PMC6644188.</a>
Competence	The proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.	<a href="#">D1.1</a> p. 70
Dissemination	Dissemination means making results available to the people that can best make use of them e.g. scientific community, industry, other commercial players, policymakers, and more.	<a href="#">European Commission</a>
Guidelines	Recommendations and often examples, laying out best practice or advice regarding a certain procedure, activity, or topic. For documents containing more prescriptive instructions, use "rules (instructional materials)"	<a href="#">Art &amp; Architecture Thesaurus® Online</a>
Handbook	Portable books, treatises, or compendiums, covering one or more subjects, arranged for quick location of information and of a size such as may conveniently be	<a href="#">Art &amp; Architecture Thesaurus® Online</a>

	held in the hand. Examples are instructional manuals and guides to museums' collections.	
Knowledge	The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.	<a href="#">D1.1</a> p. 70
Learning	The activity of obtaining knowledge.	<a href="#">Cambridge Dictionary</a>
Learning Management System	A learning management system (LMS) is a software application used to administer, document, track, and report on training programs. E.g. Moodle.	4CH
Learning platform	A learning platform (or eLearning platform) is an online portal that provides learners and administrators with tools and resources to help enhance the delivery and management of training initiatives.	<a href="#">Lorman Team</a>
Learning resource	A physical or digital creative work that has a particular and explicit orientation towards learning, education, skill acquisition, and other educational purposes. Note: A learning resource is not the same as an educational event, but may be created as a result of one, for example a recording of a training webinar. Note: a training resource is a learning resource, but a learning resource is not necessarily a training resource.	Schema.org
Learning system	Learning System: A learning system is essentially a collection of artefacts that are 'brought together', in an appropriate way, in order to create an environment that will facilitate various types of learning process. Learning systems can take a variety of different forms - for example, a book, a mobile form, a computer, an online forum, a school and a university. Most learning systems will provide various types of learning resources and descriptions of procedures for using these to achieve particular learning outcomes. They will also embed various strategies for assessing the levels and quality of the achievement of their users.	<a href="#">Barker 2010</a>
Skills	The ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).	<a href="#">D1.1</a> p. 70
Support	The process of providing assistance, relief, or reinforcement.	<a href="#">Art &amp; Architecture Thesaurus® Online</a>

Synchronous training	Synchronous: occurring in real time ('live'), at the same time as the other learners and the instructor(s); in contrast to asynchronous or self-paced, where the learner follows the training at their own pace.	4CH
Training	Organised activity aimed at imparting information and/or instructions to improve the recipient's performance or to help him or her attain a required level of knowledge or skill.	EUDAT glossary
Training (resources) catalogue	A catalogue or register (here: online) of training resources, consisting of a database with training resource metadata. It can also contain a search interface and a landing page for in-house training resources. Note: often used as a catalogue of learning resources in general. EUDAT: Training register: List of training components with a detailed description.	New definition, based on Vallo et al. 2022.
Training event	Event where knowledge transfer occurs. Can have different appearances and using different training components.	EUDAT glossary
Training resource	A learning resource used in a training environment or for training activities that are part of a training plan and involve instructors, facilitators and students. EUDAT: Training component: Self-contained presentation, text, multimedia file, exercise, etc. that aims to transfer knowledge or skills.	EOSC Future glossary
Training system	System: a way of doing things; a method. Training system: a method for organising training materials and delivering training. See also: learning system. <i>Note: specific use within 4CH</i>	<a href="#">Cambridge Dictionary</a> 4CH
Understanding	The application of knowledge to direct and supervise relevant tasks and projects.	<a href="#">Anderson, Reynolds, Kolb</a>
Valorisation	An alternative to the term "promotion" to cover a broader and more wide-reaching range of actions. Valorisation ( <i>mise en valeur</i> ) or "Cultural Valorisation" can be intended as the act of thinking or stating that something has value or is valuable. 4CH includes efforts designed to recognise, interpret, understand, make accessible, enhance, promote and sustainably develop heritage places and objects.	<a href="#">D1.1</a> p. 33



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## Executive summary

The main goal of the 4CH Project is to set up the methodological, procedural, and organisational framework of the European Competence Centre (CC) about Cultural Heritage (CH), able to seamlessly work with a network of national, regional, and local cultural Institutions, providing them with advice, support, and services.

This report describes the results of Task 4.1 concerning procedures and protocols to access CC services and consultancy, and Task 4.3 focusing on Training Services on the field of activities identified, with a specific focus on the area on which the CC will release protocols, guidelines or platform tools. The research activities contribute to the general and overall objectives of WP4 of defining the services that the CC will offer, based on the 4CH organisational and operational structures.

The introduction recalls the general aims and contents of the Deliverable, pointing out the links with others relevant WPs and Tasks of the project, in particular: identification of target users and main requirements (WP1), main activities and operational framework of the future CC (WP2), implementation of the 4CH operating structures - CH Cloud, 4CH platform and related Knowledge Base (WP3), financial and legal infrastructure (WP6). The research activities and the results developed within the two Tasks have been reported in two distinct chapters, following a similar approach: premises and work methodologies, analysis for the definition of recommendations on, respectively, access rules/conditions to all services identified and (more in-depth) training activities. Transversal aspects and contributions of both Tasks have been addressed in the conclusions.

The summary of the contents relating to the two main chapters of this Deliverable is described below.

Task 4.1 has started from the systemization and implementation of the project premises and the results developed in other Tasks and WPs. The project proposal has provided a preliminary contribution for the identification of the macro categories of services that will be offered by the future CC, with respect to which the access procedures will be defined. The acknowledgment of the main variables that influence these rules and the different methods for similar services was developed with the support of the detailed analysis of nine case studies, selected from those included in the survey of D2.1- *Report on CCs analysis*, according to criteria of selection based on the offer of a complete portfolio of services and the competence area (Cultural Heritage). Information on users, useful for 'profiling' the protocols, was collected through a critical observation of the results reported in D1.2 - *Initial survey on user needs*. The research and analysis stage, supplemented by further case studies and inputs, contributed to the definition of a workflow represented as an abstract model that describes the sequence of steps/actions to be performed to access the services, and two examples of specialisation of the workflow deriving from different combinations of three main variables identified: user category, service

category and charging (if applicable). The conclusion to chapter 2 provides a preliminary programme of 4CH services and a suite of indications, inputs and lessons learned that will support the next phases and related activities of the project implementation.

Because capacity building through training is especially important for the CC, T4.3 focused on the 4CH training system. The following conclusions and recommendations were drawn:

- Training profiles: Based on the CC user groups as defined by T1.4 and analysis of existing resources, three training profiles were defined: Practitioner, manager, and policy maker. Each of these has their own expertise and needs, and they can be further divided into skill levels (beginner, intermediate, advanced).
- Content: The CC will focus on conservation, preservation, and valorisation of cultural heritage. This is broad, and therefore the most pressing training needs were identified on the basis of the user survey presented in D2.1. Training on certain techniques and methods is required, as well as on data management. The current needs focus mostly on practitioners, but training for managers and policy makers should also be developed. In addition, when new services and tools become available in the CC, these will also require training.
- Training system, organisation: Based on lessons learnt from other CCs, DCCs, and other relevant organisations, use case analysis, and the aims of 4CH, we recommend to have:
  1. As part of the 4CH KB, a searchable and open learning resource catalogue with rich, standardised metadata with both 4CH training materials and other learning resources (e.g. guidelines) and relevant, external resources. A spreadsheet to collect these resources in a systematic way, with rich metadata, has been set up.
  2. Training delivery, managed by partner organisations and advertised through a 4CH event page, ideally also with rich metadata.
  3. A training directory as a trusted expert pool of trainers and training organisations.
- Metadata are important as they facilitate the optimal access, usage, exchange and exploitation of the learning resources. T4.3 used the RDA Minimal Metadata for Learning Resources and the experiences of SSHOC and EOSC to set up a recommended list of metadata attributes with controlled vocabularies and relevant authority lists for learning resources in the catalogue. We also recommend metadata for training events, based on ELIXIR-TeSS and the Bioschemas CourseInstance and Course.
- To make the training system FAIR, (metadata of) training materials should have a persistent identifier (PID) and be stored in a Trustworthy (i.e. certified) repository.
- 4CH curriculum framework for training: to develop training on digitisation in cultural heritage, organisations can use the 4CH curriculum framework for training. The framework defines User Profiles, Stages, Subjects and Topics, which can be used by organisations to identify and direct the learning required by team members for successful digitisation projects. Learning providers can combine Topics into workshops or learning materials to deliver relevant training adapted to the organisation's needs.

# 1. Introduction

## 1.1 Objectives and contents of the Deliverable

According to the 4CH project description, Deliverable D4.2 is expected to describe the rules<sup>1</sup> for accessing the services and the training modules of the Competence Centre, giving an account of the research findings of the T4.1 “Procedures and protocols to access to CC services and consultancy” and the T4.3 “Training Services on the field of activities identified, with a specific focus on the area on which the Competence Centre will release protocols, guidelines or platform tools”.

The services provided by the CC will contribute to increasing and enhancing the digitization of Cultural Heritage for its conservation, preservation and dissemination, supporting Cultural Institutions and SMEs carrying out digitisation projects in identifying and implementing key standards, guidelines, benchmarks and methodologies that match their needs and the solution required; and enhancing capacity building among CH institutions, including staff training (upskilling and retraining) using different modalities (Project Objective 3). The implementation of this aim is associated with the design and implementation of a technological platform able to foster the collaboration and interaction among European CH Institutions, allowing access to an interdisciplinary network of knowledge, and providing advice and support (Project Objective 2).

T4.1 (project months 9-28) is devoted to identifying a protocol profiled on the identified target users (T1.4). The protocol will consider different levels of access to the CC, such as advising and orientation (analysing research, mapping risks, addressing new needs and releasing standards), training and capacity building (technology transfer and upskilling), support in innovation and projects (innovative services and tools, data reuse, policy-making, steering research activities). T4.1 also manages the recruitment of members for the National CH Competence Community, by actively involving intermediaries such as trade unions, third sectors, foundations, associations linked to CH, but this activity is not part of the present Deliverable. The Task has developed these rules at a general level following an open and abstract model, capable of incorporating inputs and specialisations in terms of technical procedures and other aspects related to the legal organisation and the economic plan which will ensure the long-term sustainability of the future CC.

T4.3 (project months 9-28) is dedicated to the definition of the structure of the 4CH training system, planning content, organisation, and material.<sup>2</sup> Content-wise, the system concerns all the areas addressed by the project, and focuses on the complete target trainee audience (e.g. managers, policy makers, and professionals/practitioners). T4.3 has developed plans and strategies on how the CC can contribute to building capacity at cultural heritage institutions,

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<sup>1</sup> In the sense of instructions.

<sup>2</sup> We take a broad view of a training system as a method for organising training materials and delivering training, also discussing how a learning system, as a collection of learning resources, could be implemented.

such as through providing (metadata of) relevant existing learning resources in the Knowledge Base (Project Objective 2; Fig. 1.1) and by providing training as a service (Project Objective 3). T4.3 also formulates best practices for setting up such a training or learning system (Project Objective 4).

The Deliverable is divided in two chapters corresponding to these two tasks. Nevertheless, the development of the contents has been conducted in a joint and coordinated way. Moreover, the work done in the two tasks takes into consideration the wider framework of the whole of WP4 and the relationships with other connected and pertinent tasks in other WPs.

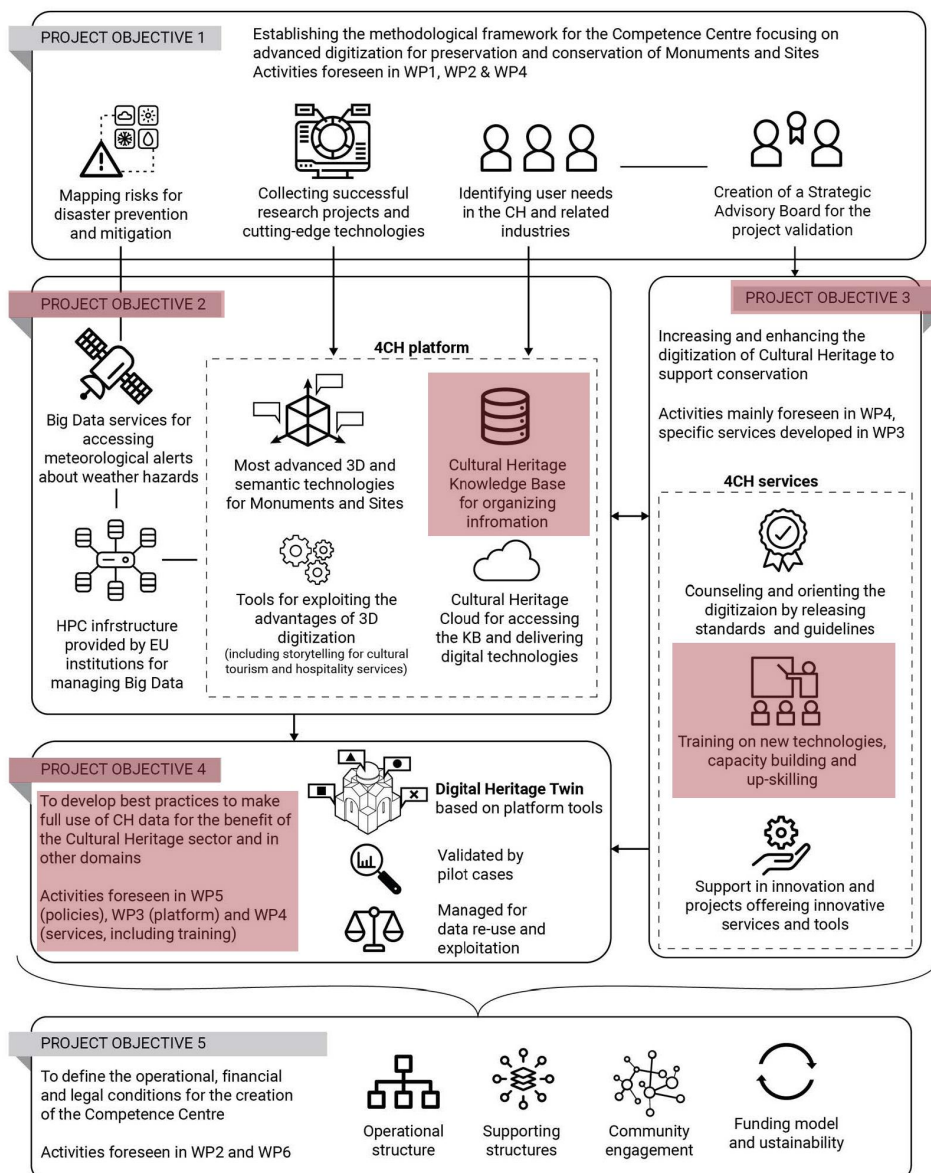


Figure 1.1. Overview of the 4CH project objectives marking Task 4.1 and T4.3 areas of relevance (graphic elaboration from the diagram reported in the 4CH project proposal, PART B, p.6).



## 1.2 Correlation between Tasks and WPs: general framework

WP4 - *Service deployment system* is divided into 4 tasks whose general aim is to build on the 4CH structure (WP2) and platform (WP3) for defining the services that the Competence Centre will offer. The CC services should go beyond the sphere of research and development, and support the market/policy deployment of CH conservation processes, services and products. The CC will support the European CH industry (CH agencies, institutions, companies, professionals, etc.) and other related industries (creative industry, tourism, hospitality etc.) in exploiting the added-value of CH digitization for preservation and conservation, overcoming existing hindrances by developing and acquiring new advanced skills.<sup>3</sup> For these reasons, T4.1 looks at the broad range of potential users and T4.3 defines the structure of the 4CH training system according to these target audiences.

In order to bridge the gap between research and business, policy-making and finance, the CC will provide services oriented to three main areas:

- 1) advising and orientation (analysing research, mapping risks, addressing new needs and releasing standards);
- 2) training and capacity building (technology transfer and upskilling);
- 3) support in innovation and projects (innovative services and tools, data re-use, policy-making, steering research activities).

The second point about training and capacity building activities is considered particularly relevant by the 4CH project, whose implementation work plan assigns them a specific and dedicated task, namely the T4.3, included in chapter 3 of the present Deliverable, whilst points 1, 2 and 3 are addressed as a whole in chapter 2.

The other two tasks of WP4, not directly addressed by this Deliverable, are T4.2 “Standard and guidelines to CH digitization” and T4.4 “Implementation of workflows and simulation through pilot cases”.<sup>4</sup> T4.2 aims to define the technical and organisational requirements to access the Knowledge Base, taking into consideration data interoperability and reuse. T4.2 supports on-going pilot projects or implements new ones, aiming at defining the basis and the methodology that the digitisation standards and guidelines, developed by the CC, will be based on. Moreover, T4.4 serves as a testing of the workflow, in order to define the related CC components and bodies to activate, also in relation to the services to be put into play and the procedures to be applied on heritage monuments and sites case-studies.

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<sup>3</sup> 4CH project proposal.

<sup>4</sup> The research activities by T4.2 have been presented in [D4.1 - Report on standards, procedures and protocols](#) (submitted at month 21): the Deliverable reports on the recommendations developed by the project as regards standards and best practices on 3D digitization. An update, based on pilots results, is expected at month 36 (D4.3). The final results by T4.4 will be included in D4.4 : *Report on pilots* (to be submitted at month 36). The Deliverable describes the pilot cases and their implementation: conditions, solutions and lesson learned (T4.4), updating the Deliverable D4.2 based on that. It will also include a report on the recruitment of members for the National CH Competence Community (T4.1).

Tasks T4.1 and T4.3 present strong links with other ongoing 4CH project WPs and Tasks, to be concluded in a next phase of the project. The mentioned links refer to:

**WP1 - Definition of 4CH requirements and the field of activities of the future Competence Centre (*ongoing*)**

According to the 4CH proposal, T4.1 is expected to identify a protocol to access the CC services, profiled on the identified target users and it is explicitly invited to take into consideration the work made by the Task 1.4 “User needs: mapping existing analysis on user needs and defining their continuous update”, and the related [D1.2 - Initial Report on user needs](#) (submitted in April 2022). An update of the Deliverable is expected for month 35 (November 2023).

The exploited results for further analysis refer to the **identification of target users** (audience) and **main requirements** (needs related to users jobs, pains and gains). Also T4.3 is strictly linked to T1.4 since the structure of the 4CH training system concerns all the areas addressed by the project and must be calibrated on the different target trainee audience, expressing different needs, levels of depth, time expenditure, focus areas and so on.

**WP2 - Definition of the 4CH operational framework (*ongoing*)**

As stated in the project proposal, the new Competence Centre for the conservation and preservation of Cultural Heritage set up by 4CH project will be based on lessons learnt from the analysis of existing CCs. Thus, the present D4.2 builds on the analysis performed in [D2.1 - Report on CCs analysis](#) (issued in Month 7 - July 2021), a survey on existing Competence/Knowledge Centres and similar entities, in order to analyse their portfolio of services and identify the variables that influence their access (see 2.2.2.1 Criteria of selection and working methodology). D2.1 collects the results of the project activities of the *Task 2.1* “Analysis of existing European CCs: structure, organisation, procedures, services deployed and policy”.

WP2, within its two other still active tasks, is conducting two main activities:

1. prepare the background for the organizational setup, providing a methodology framework for the CC and the Network structure definition phases (stakeholders consultation, participation practices, engagement, impact assessment, new procurements, etc.) and including the organization of services in three strands: 1) advising and orientation, 2) education and training, 3) innovation and projects (T2.2 “Methodological, procedural, and organisational framework of the Competence Centre on Cultural Heritage” - *ongoing*);
2. define in detail the operational structure, including the governance structure, the Thematic Departments and external supporting structures.

The Task 4.1 will collaborate in these activities by providing input on methods for accessing the services and on the management of the recruitment of members for the National CH Competence Community. The final research outcomes of WP2 will be presented at the end of the project in *D2.2 - Report on the planned organisation of the Competence Centre on Cultural Heritage* (month 36 – December 2023).

**WP3 - Implementation of 4CH operational platform (*ongoing*).**

WP3 is focused on the set up of the technological 4CH Platform, based on ICT solutions 3D, H-

BIM and semantics, for unleashing the potential of CH Big Data. It is to be assumed that a relevant number of the CC services will be provided by the 4CH platform, so the link with T4.1 and T4.3 is represented by how such an operational structure, under development by WP3, is expected to manage the access to the services of the future CC. Moreover, the 4CH platform will allow the access of the Cultural Heritage Knowledge Base, a complete catalogue of all the resources made available by the 4CH partners, built according to the modern principles of semantics and through the use of shared standards and vocabularies, and intended to provide quick access to all the information and knowledge available in the CC. Other services might be delivered using the 4CH Cultural Heritage Cloud - another 4CH technology aimed at fostering a culture of collaboration via the sharing of the activities. The WP3 research results implemented so far are reported in the Deliverable [D3.1 - Design of the CH Cloud and 4CH platform](#) (submitted in July 2022) and [D3.2 - Integration of the INCEPTION 3D and H-BIM technologies](#) (submitted in January 2023).

**WP6 - 4CH policy and financial sustainability** (*ongoing*).

WP6 aims at defining the financial and legal infrastructure of the future CC. The relevant links with T4.1 and T4.3 are formed by the influence that the final legal structure, the governance, the corporate statutes and the relationship with the network of National CH Coordination Centres - currently under development - will play on the collaboration agreements between the CC and the network of institutions with which it will operate, both in terms of collaborative research and the mutual offer and exchange of services. Another link is described by the business and sustainability plan that will assess the costs (including services) and the funding model of the CC, considering any possible contributions from national and European institutions together with their own sources deriving from the service provision. The WP6 research results will consider the WP4 results, and will be reported in Deliverables D6.1 - *Governance and legal structure description* and D6.2- *Strategic and Business plan and financial provisions* (both expected at month 30 - June 2023).

The submission of D4.2 fits in the ‘fine tuning’ phase (M24 > M30) of the project methodology, to be run and developed in WP4 and WP6. Building on the results and research activities implemented in the previous stages, the 4CH project is expected to define: procedures and protocols to access CC services (T4.1); training services on the field of activities identified, with a specific focus on the area on which the Competence Centre will release protocols, guidelines or platform tools; legal structure, governance, business and sustainability plan for the Competence Centre (WP6, T6.1 and T6.2).

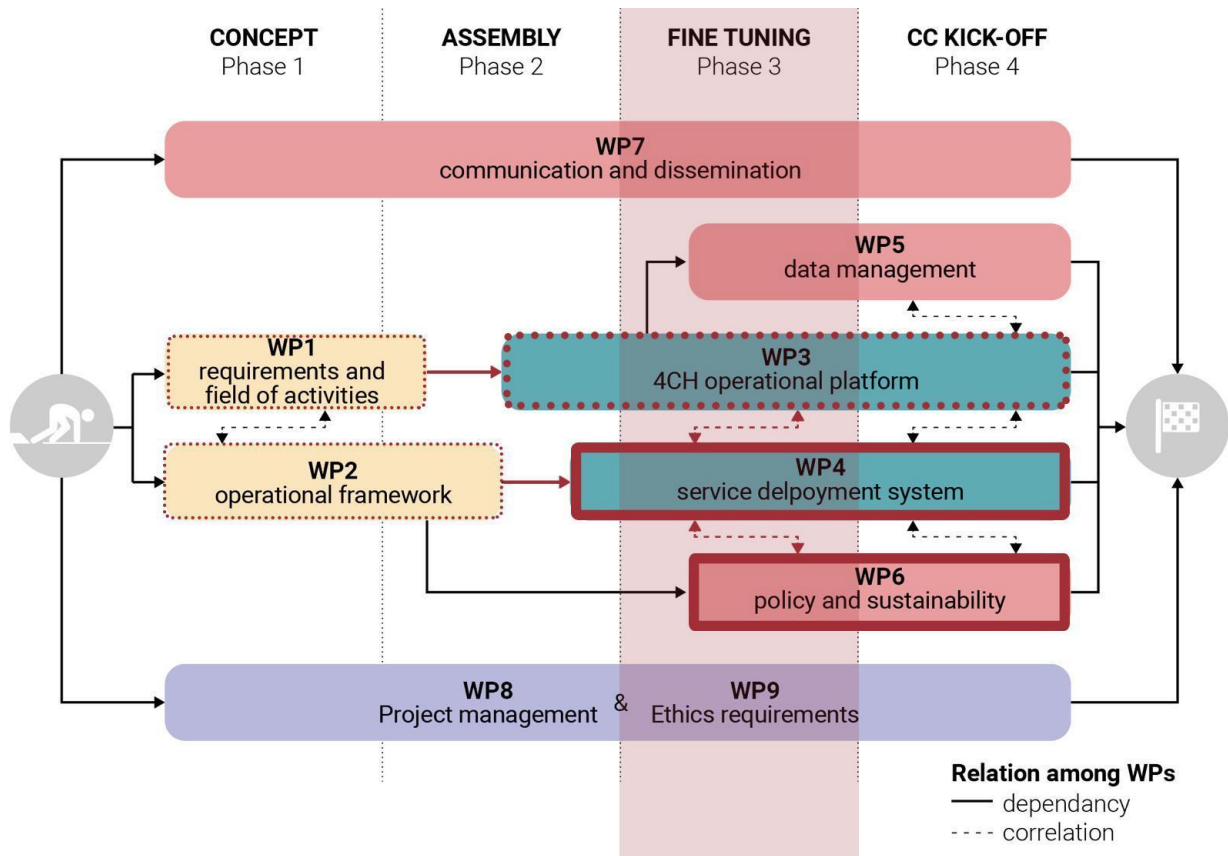


Figure 1.2. Correlation between Wps and working phases (graphic elaboration from the diagram reported in the 4CH project proposal, PART B, p.35).

## 2. Procedures and protocols to access the CC services and consultancy (T4.1)

### 2.1 Introduction

#### 2.1.1. Aims and objectives of Task 4.1

This chapter reports the results of Task 4.1 (T4.1) “Procedures and protocols to access CC services and consultancy”. The Task should define a set of actions (procedures) - conducted according to a certain order or manner - to access information and related resources, and outline the rules - instructions on what users can or cannot do (protocols) - which must be followed by users to access the various services of the CC, considering their requirements, skills and objectives based on known traits or tendencies (profiling). The task is led by UNIBO, with partners INCEPTION, PIN and ATHENA.

This chapter consists of the following parts:

- Section 2.2 “Toward the definition of access protocol and procedures”, describes the outcomes of analysis implemented in order to acknowledge:
  - (2.2.1) What are the services provided by the CC, according to the three macro-categories (Consultancy and orientation; Training and capacity building; and Support in innovation and projects), as defined in the proposal and under developed by WP2 (ongoing);
  - (2.2.2) What are the access conditions to services, considering the different aspects involved (e.g., users, management, registration, language, delivery mode, application, etc.). This builds on the in-depth analysis of nine case studies, selected among the the list of CCs and similar entities as defined by T2.1 research activity and reported in [D2.1](#), to highlight the set of actions to be implemented and the variables considered as relevant for defining the rules of access to the CC services;
  - (2.2.3) Who are the users accessing the CC services, starting from a critical analysis of the the results reported in the [D1.2 - Initial analysis on user needs](#).
- Section 2.3 “Workflows to access CC services”, reports on the workflow (represented as an abstract model) that describes the sequence of actions required by users to access the services of the CC, considering inputs and lessons learned from the preparatory and analytical section 2.2.
- Section 2.4 “Summary of recommendations”, collects the final considerations on results achieved and topics that are still open about the rules for accessing the CC services.

#### 2.1.2. Working methodology

Task 4.1, with the aim of gathering knowledge and information for the definition of the rules to access the services, has followed a precise methodology, based on the critical systemisation and exploitation of the results achieved in the linked WPs and Tasks (as described in the introductory paragraph 1.2). Bilateral and internal meetings between all directly involved

partners (T4.1, T4.3 and other WPs and Tasks) supported the exchange of information in a collaborative way.

The first need this work addresses is a more detailed definition of what services the future CC could be able to provide. The initial macro categories of services, already drafted in the project proposal (Consultancy and Orientation, Training and Capacity Building, Support in Innovation and Projects) have been deepened under the lens of the main activities that define them and the actions carried out by the future CC on Cultural Heritage in addressing the needs of its users.

This activity was developed starting from a review of the [D2.1 - Report on CCS analysis](#) (T2.1, in which UNIBO was involved), which provided a list of entities and info on the portfolio of services offered. Nine case studies were selected to be re-analysed in detail, so as to recognize the variables that most describe the various access methods.

One of the main efforts was to define a methodology that could lead to a classification of the activities, of their management requirements and of their access procedures, all in relation to the different categories of users. The work moved from an analysis of a list of aspects associated with the 3 main strands of services, plus an additional type. First, how services are presented ('Presentation of services'). For 'Consultancy and Orientation': how the user/users get in touch with the centre and receive support on specific topics (Contact/Help); how the centre presents itself, communicates events and news, informs users about legal policies and privacy (Communication); how the centre disseminates and shares knowledge from its research activities (Dissemination); how the centre supports, guides and advises on specific topics/issues (Orientation, Guidance and Consultancy). For 'Training and Capacity Building': how the centre promotes training programmes, gives access to learning resources, leads users to acquire, develop, strengthen or increase skills. For 'Support in Innovation and Projects': how the centre gives access to specific digital enabling applications, tools and technologies; shares collections and datasets or allows storage to/from its archives/repositories; makes available specific equipment or physical spaces, if applicable (Enabling access/storage of technologies and datasets, physical equipment); how the centre manages/presents its involvement in research projects, promotes collaborative research making available projects outputs and results; creates and promotes interdisciplinary networks (Collaborative research and networking).

By observing how these entities manage the portfolio of services they offer, it was possible to identify the main variables that describe the access procedures, in particular: users (described using the categories identified by the 4CH project - WP1, T1.4); supporting devices and structures; type and/or format of resources/activities; management (main access point); access conditions (registration and/or charging); language; links to internal or external resources/platforms; level (professional or not); and (only of training service) delivery mode, timing and credits.

The analysis was supported by the creation of special working tools: a series of ad hoc factsheets that made it possible to observe the correspondence between the services offered and the variables identified, both for the individual case studies and for all the analysed

centres, in order to develop comparative considerations. The study of the access rules relied on the support of an additional research activity, described in a dedicated section of this paragraph: the participation in a workshop developed within the UNA RESIN project.

The results on the analysis of the requirements identified for a set of user categories (developed by T1.4 - WP1) have provided further inputs for the profiling of target users - data on what are the main shared/common needs, users and fields of application, as resulting from the survey - as specifically required in the project proposal. Also in this case, the elaboration of ad-hoc tables enabled the visualisation and critical reading of the data reported in [D1.2 - Initial report on user need analysis](#).

The workflow, which traces the sequence of main actions that CC users will have to perform for accessing the services, was developed taking into consideration the lessons learnt from the case studies analysis and user categories. Other relevant inputs refer to the research activities developed within the WP3, as reported in D3.1 - *Design of the CH Cloud platform*, and by T3.4 - *Cultural Heritage Knowledge Base*, considering that many of the services provided by the CC will be managed through this platform (still under definition). The study of further case studies (the ARIADNE plus and PARTHENOS portals) contributed to the design phase.

T4.1, therefore, delivers four main outputs: a set of variables influencing the access procedures, a workflow represented as an abstract model describing the steps required, a draft programme of 4CH services supplemented by a series of recommendations. Figure 2.2 illustrates the working methodology.

#### **4CH in Una.Resin workshop**

As mentioned in the previous paragraph, the work of T4.1 benefitted from the participation of the task leader, UNIBO, in the Una Europa alliance<sup>5</sup> and Una.Resin related H2020 project.<sup>6</sup> UNIBO is one of the 11 Universities of the Una Europa alliance funded under the European Universities Initiative.

The Una Europa goal is to create a European inter-university environment by triggering institutionalised cooperation in the area of education, research, innovation and societal outreach (R&I). The 3-year project Una.Resin (call for proposal H2020-IBA-SwafS-Support-1-2020; Grant agreement ID: 101017416) kicked off in February 2021 and has been working to lay the groundwork for a common R&I eco-system, sharing research infrastructure and resources, and strengthening human capital. Una.Resin will develop and implement accompanying action plans and roadmaps and test innovative models for barrier-free interdisciplinary cross-border collaboration and team science to address societal challenges. The 4CH project has been identified by Una.Resin among the relevant Research Infrastructures and Resources (RIRs). In

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<sup>5</sup> <https://www.una-europa.eu/>

<sup>6</sup> <https://www.una-europa.eu/about/una.resin>

particular, 4CH was selected by the mapping activity about the RIRs focused on the global interdisciplinary challenge related to Cultural Heritage.

In the Una.Resin context, the WP2 co-creation workshop ‘From mapping to co-creation: towards a Una Europa Strategy and Action plan for sharing Research Infrastructures and Resources’ was held online on 23rd June 2022. During the workshop, relevant principles for opening and sharing RIRs across universities were discussed: among them, strengthening skills and knowledge related to RIRs management; access rules, barriers and compliance with ethical and privacy regulations or other regulatory constraints; technical and financial limitations and other influencing factors, such as language and lack of specialised staff. The Una.Resin experience of research and discussion about these themes, provided a useful perspective on sharing and accessing R&I infrastructures, even if the work has been specifically focused on the university RIRs. This experience flowed into the reflections and considerations made by T4.1.

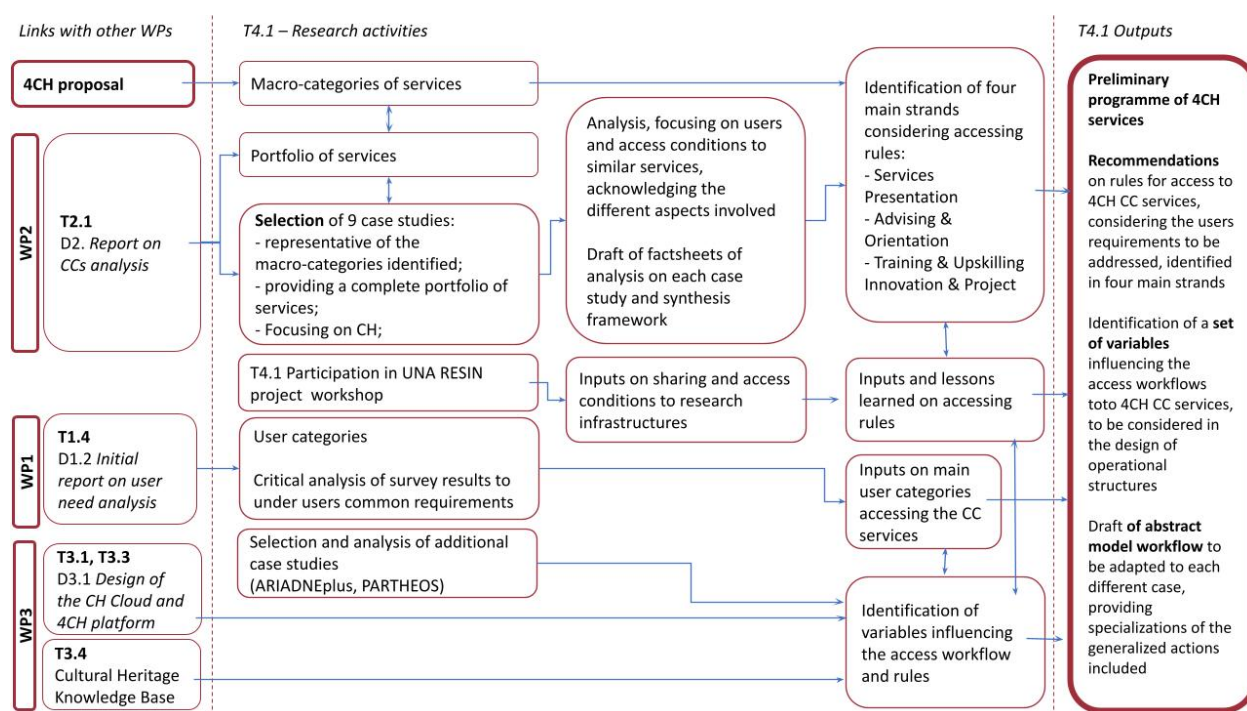


Figure 2.1. Overview of the T4.1 working methodology.



## 2.2 Toward the definition of access protocol and procedures

This section describes the different steps of research implemented, starting from the 4CH proposal and other related project activities, in order to collect useful inputs for the definition of the procedures/rules to access the services of the future CC.

### 2.2.1 The services of the CC

The future CC on the Conservation of Cultural Heritage, as stated in the 4CH project proposal<sup>7</sup>, will offer knowledge (advice and support) and services to the broad CH community, made up of national and regional heritage agencies, cultural heritage institutions, professionals and citizens.

The CC will operate considering the very wide and complex field of action consisting of historical monuments and sites, promoting and contributing to enhance and upskill competences, skills and expertise, effective strategies and solutions for conservation, preservation and promotion of CH assets. Monuments, historic buildings and urban areas, represent a significant common resource at social, cultural and economic level, important for European history and identity.

The CC will raise awareness among institutions and professionals – but also with the general public – about ICT solutions (including 3D digitization), considering the great potential and benefits that high-quality digitization has for sustainable exploitation of heritage assets, documenting, monitoring, mitigating and preventing damage caused by natural degradation, human-related developments and disasters.

The 4CH Project, in addition to paving the way for the setting up of the CC in terms of organisational framework, has to define (design and test) its activities in terms of advice, support and services, including the related supporting infrastructures and tools.

- **Advice** will be provided considering the state-of-art in research and cutting-edge technologies related to preservation, conservation and sustainable promotion of monuments and sites, and informing about the most valuable initiatives, experiences and best practices across Europe and at international level.
- **Support** will cover, in a cross-cutting way, the promotion of a holistic and multidisciplinary approach to CH; the facilitation of coordination, networking and partnerships between Heritage Agencies and CH Institutions across Europe, and ongoing European initiatives, enabling the transfer of research project results by the CH sector.
- **Services** will refer to consultancy, guidelines and protocols concerning the use of ICT, with special attention to 3D; integrated technologies and tools for management, assessment and monitoring; training and upskilling programs, in particular for CH institutions, operators and professionals.

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<sup>7</sup> 4CH project proposal, 'Excellence', p. 4.

The project proposal sets out three strands of services: consultancy and orientation, training and capacity building, and support in innovation and project. It also defines sub-categories through which kind of activities the CC will perform its role of advising, supporting and ‘serving’ the wide CH community (table 2.1, first and second column). Considering the Task 4.1 objectives, these activities have been associated with very general categories of services, in particular: consultancy, orientation, dissemination/knowledge sharing, guidelines and standards release, training programmes and resources, access to enabling technologies and tools, dataset access and storage, networking, collaborative research (Table 2.1, third column). T4.1 further assesses and reviews the three strands of services and the sub-categories drawn up from the project proposal through the analysis of case studies.

<i>4CH Project proposal</i>		<i>T4.1.elaboration</i>
<i>Excellence</i>	<i>T4.1 description</i>	<i>Type of services and activities</i>
<b>1. CONSULTANCY AND ORIENTATION</b>		
analysing experiences, skills and best practices, past and ongoing research implemented so far in the European Countries;	analysing research	Consultancy Orientation Dissemination / Knowledge Sharing
mapping risks which can damage Cultural Heritage and technology that can help in avoiding them;	mapping risks	Consultancy Orientation Dissemination / Knowledge Sharing Guidelines And Standards Release
Creating and promoting of interdisciplinary networks and mapping user needs;	addressing new needs	Collaborative Research Networking
releasing standards and guidelines for digitizing CH and managing preservation and conservation activities.	releasing standards	Consultancy Guidelines And Standards Release
<b>2. TRAINING AND CAPACITY BUILDING</b>		
creation and maintenance of training material for up-skilling using different modalities, both for distance learning and proximate learning;	up-skilling	Training Programmes And Resources
sharing best-practices and promoting the use of released standards, guidelines and tools.	technology transfer	Dissemination / Knowledge Sharing
<b>3.SUPPORT IN INNOVATION AND PROJECTS</b>		
promoting innovative services and tools for the 3D digitization of Monuments and Sites;	innovative services and tools,	Access To Enabling Tools And Technologies
facilitating access to finance, sharing knowledge about EU funds and national projects for innovation;	steering research activities	Consultancy Dissemination / Knowledge Sharing Collaborative Research
support innovative use and re-use by SMEs of data in edutainment and cultural tourism	data re-use	Datasets Access/Storage
working directly with the EU Commission policy Directorates-General, paving the way for new Research	policy-making	Networking

Table 2.1. Preliminary list of 4CH services.

### 2.2.2. Portfolio of case studies for acknowledging rules to access the CC services

This paragraph reports the research activity implemented based on the results of [D2.1 - Report on CCs analysis](#). The section includes:

- the description of the criteria followed for the selection of nine case studies (one for each category among those included in the D2.1);
- the list of services analysed, identified by macro-categories considering the access procedures point of view;
- the results of the analysis focusing on the access conditions to the macro-categories of similar services, acknowledging the different aspects involved (e.g., users, management, registration, language, delivery mode, application, etc.).

The aim of the analysis is to identify variables, constants and highlights considered relevant for defining the rules of access to the services of the future CC. The factsheets used as working tools for the analysis on the single centres and the general framework of comparison are included as Appendices (T4.1 Appendices 1 and 2).

#### 2.2.2.1. Criteria of selection, working methodology and research framework

The additional inquiry, building on the D2.1 results, considers the portfolio of services provided by the different macro-categories of centres to which a sub-chart in the T2.1 factsheet was dedicated. The T2.1 survey collected quantitative information supported by a pre-set multiple-choice answer referring to a list of services.

The T2.2 in-depth analysis considers a sub-selection of entities operating in the main shared fields of action and providing the main types of mapped services, grouped into the three strands, as stated in the project proposal.

The data visualisation diagrams below, from D2.1, show that the services provided in most cases are: Consultancy and orientation, Training and capacity building, Dissemination activities (Conferences, webinars, meetings, journals, newsletters, etc.) and Data collection and management, often with the support of digital platforms.

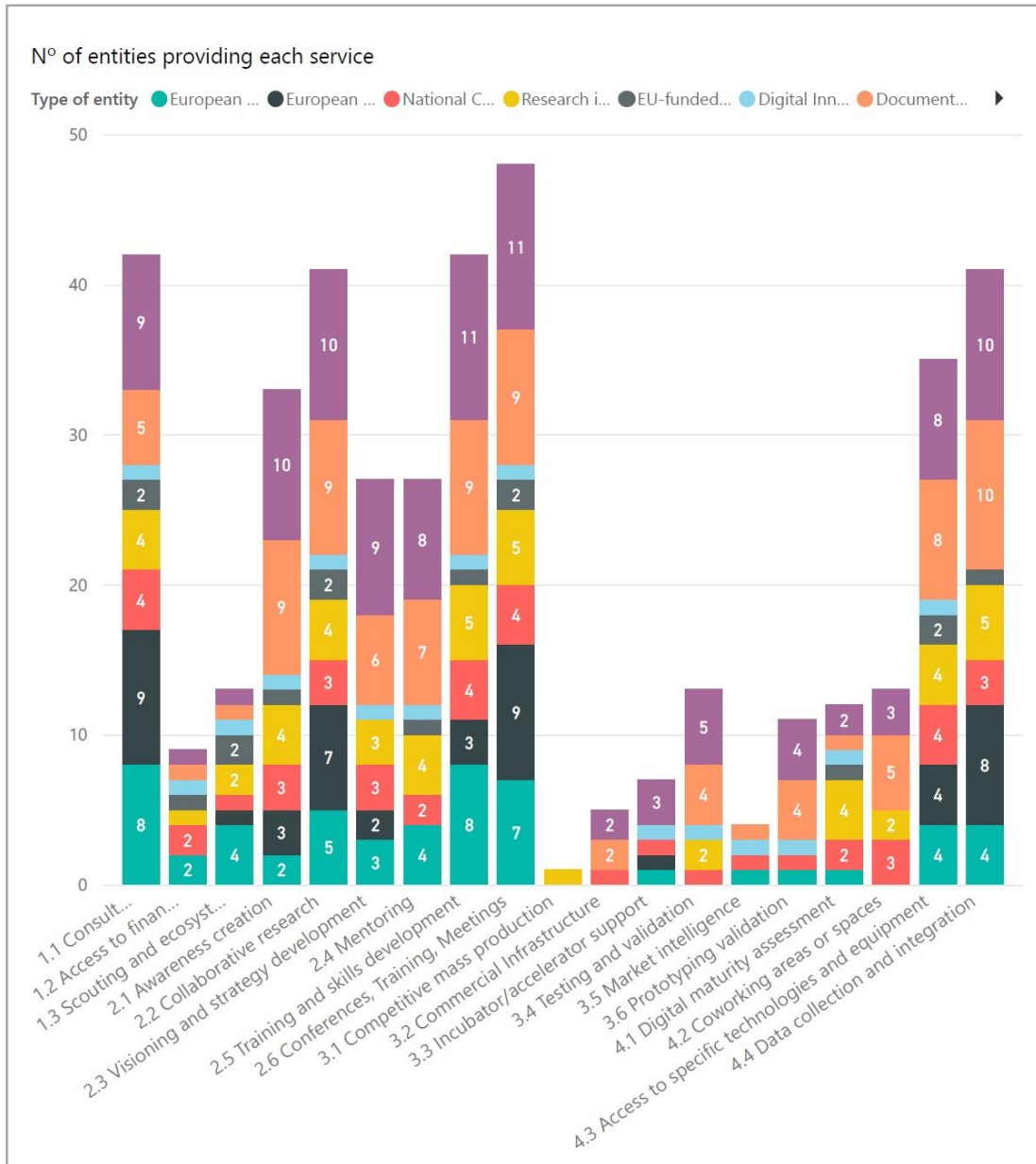


Figure 2.2. Type of services offered data visualisation: detail of all the analysed centres (source: D2.1 PowerBI research results elaboration).

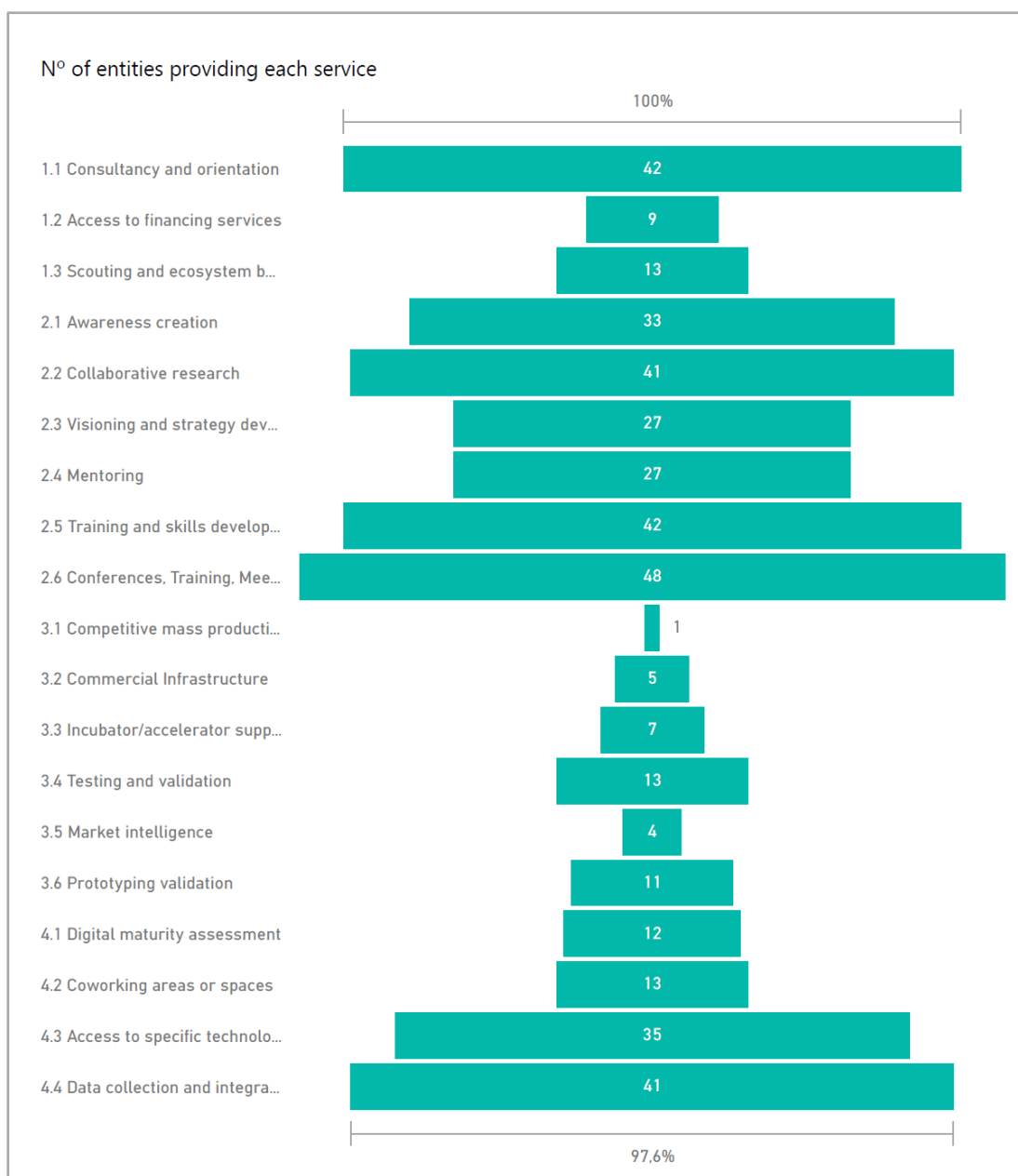


Figure 2.3. Type of services offered data visualisation: all the analysed centres (source: D2.1 PowerBI research results elaboration).

Concerning the focus, Cultural Heritage related to several fields of action (3D documentation, Cultural Heritage Cloud, Cultural Heritage conservation, Cultural heritage preservation, Cultural Heritage promotion, Libraries and Book Heritage, Cataloguing the CH, Research and develop knowledge methods and instruments), and Data and ICT (Data acquisition, Data and metadata, Data management and storage, Data preservation, ICT, Modelling, Techniques and instruments for digitization, Standards, Open Access Research, Open Science, FAIR data, Supercomputing), result as the most relevant.

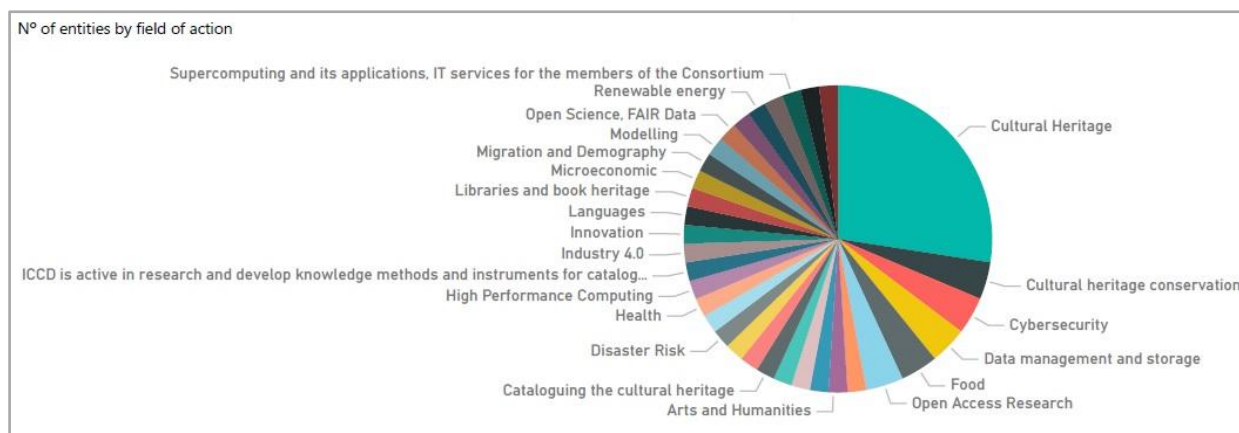


Figure 2.4. Fields and main focus data visualisation: all the analysed centres (source: D2.1 PowerBI research results elaboration).

Given these premises, with respect to the 51 entities included in [D2.1](#), nine representative case studies were selected, choosing the centres presenting a more complete offer of services and with a specific focus on Cultural Heritage and the key topics on which the CC will operate (Table 2.2). The aim is to acknowledge and understand how those centres/institutions present and give access to their portfolio of services, in order to inform the rules to be drafted for the future CC.

CCs and similar entities (D1.2)		
Main categories	Sub category (when applicable)	Name
National CCs (Europe)		<b>The Dutch National Centre of Expertise and Repository for Research Data (DANS)</b>
Research infrastructures		<b>Digital Research Infrastructure for the Arts and Humanities (DARIAH ERIC)</b>
Documentation Centres on Cultural Heritage	DIGITAL LIBRARIES AND AGGREGATORS OF DIGITAL CONTRIBUTIONS	<b>EUROPEANA</b>
	EXPERT-HUBS OF DIGITAL CULTURAL HERITAGE VALORISATION NETWORKS	<b>Connecting Archaeology and Architecture in Europe (CARARE)</b>
	DATABASES, DIGITAL INVENTORIES AND REPOSITORIES	<b>The Archaeology Data Service (ADS)</b>
	NATIONAL INSTITUTES FOR CATALOGUING AND DOCUMENTATION	<b>Central Institute for the Union Catalogue of Italian libraries and for bibliographic information (ICCU)</b>
Other national and international centres on CH	NATIONAL PUBLIC INSTITUTES OPERATING IN CH RESTORATION, CONSERVATION, AND PROMOTION FIELD	<b>The Centre for the Conservation and Restoration of Cultural Heritage “La Venaria Reale” (CCR)</b>
	OTHER NATIONAL RESEARCH CENTRES AND DEPARTMENTS WITH FOCUS ON PARTICULAR TYPE OF HERITAGE AREAS	<b>The Discovery Programme: Centre for Archaeology and Innovation Ireland (Discovery)</b>
	INTERNATIONAL RESEARCH AND DOCUMENTATION CENTRES	<b>The Getty Center</b>

Table 2.2. List of case studies from D2.1 for in-depth analysis on methods/management of accessing the services.

A common and transversal analysis approach/methodology to the nine case studies has been set up, so as to make the info collected from different sources and webpages as comparable as possible, describing the very various ways of presenting, managing and giving access to the services. Thus, starting from the project proposal (See 2.2.1) and supported by the analysis, the list of services has been re-drafted and tailored to T4.1 purposes, thus focusing on the accessing procedures and main/shared objectives of services.

First, an additional general category, describing how the centre presents its services and activities, has been identified as relevant.

The ‘Consultancy and Orientation’ area includes procedures related to: how the user/users get in touch with the centre and receive support on specific topics<sup>8</sup>; a list of aspects linked to communication, useful to understand how the centre presents itself, promotes events and news, and informs users on legal and privacy policies; how the centre shares knowledge and disseminates resources and results from its research activities; and finally, how the centre supports, orientates and gives consultancy on specific topics/issues.

‘Training and Capacity building’, kept as a stand-alone category, informs the study on how the centre gives access to training resources or courses, and/or offers educational activities, leading users to acquire, develop, strengthen or increase skills.

The last strand, so-called ‘Support in Innovation and projects’, includes two main sub-categories. The first one deals with accessing procedures to services related to innovative and technological aspects, in particular: how the centre gives access to enabling digital applications/tools and technologies; to digital repositories, collections and datasets; and to specific physical equipment (if applicable). The second sub-category describes all the activities referred to how the centre manages and presents its involvement in research projects, promotes collaborative research making available projects outputs and results, and creates interdisciplinary networks.

The list of services, as addressed and re-drafted by T4.1 is reported in table 2.3.

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<sup>8</sup> This service, albeit transversal, has been included in the ‘Consultancy and Orientation’ category as it is considered a primary ‘orientation’ tool among the centre’s services.

<i>Macro and sub categories of services</i>		<i>Object of inquiry/analysis</i>
<b>1</b>	<b>PRESENTATION OF SERVICES</b>	How the centre presents its services.
<b>2</b>	<b>CONSULTANCY AND ORIENTATION</b>	
2.1	Contacts/Help <sup>9</sup>	How the user/users get in touch with the centre and receive support on specific topics.
2.2	Communication (About, Legal, News, Events, Social Media, Newsletter)	How the centre presents itself, communicates events and news, informs users on legal and privacy policies.
2.3	Dissemination/Knowledge Sharing	How the centre disseminates its research activities
2.4	Orientation, Guidance and Consultancy	How the centre supports, orientates and gives consultancy on specific topics/issues
<b>3.</b>	<b>TRAINING AND CAPACITY BUILDING</b>	How the centre promotes training programmes, gives access to training resources, leading users to acquire, develop, strengthen or increase skills, providing useful tools for the adoption of enabling technologies.
<b>4.</b>	<b>SUPPORT IN INNOVATION AND PROJECTS</b>	
4.1	Enabling technologies Datasets access/sharing Physical equipments	How the centre gives access to: specific digital applications/tools, technologies; digital repositories/collections/datasets; specific physical equipment (if applicable).
4.2	Collaborative Research Networking Policy making	How the centre manages/presents its involvement in research projects, promotes collaborative research making available projects outputs and results, creates and promotes interdisciplinary networks.

*Table 2.3. List of services as identified focusing on access methods.*

<sup>9</sup> This service, albeit transversal, has been included in the 'Consultancy and Orientation' category as it is considered a primary 'orientation' instrument among the centre services.



In order to extract similar data and allow for comparative considerations, a list of variables - serving the transversal description and analysis of services has been defined, grouping and associating the different items to a set of research questions.

- **USERS: *Who are the services addressed to, considering the users categories defined in [D1.2 - Initial report on user needs?](#)***

The list of options, included in the factsheet, cover the nine categories identified by T1.4.

- **SUPPORTING TOOLS/STRUCTURES: *What support devices are used?***  
The list includes several options describing if the centre provides direct contacts (email /phone number) and/or general emails and contacts (phone number); if the supervision of the service is entrusted to a specific task force or internal thematic department; the use of focus or dedicated page within the official webpage; the use of specific software/tools or text forms, etc.
- **TYPE OF RESOURCES/CONTENTS/FORMAT: *What are the types of content, format activities and resources through which the services are provided?*** The options cover: sharing best practices and case studies; blogs; call and applications for scholarship, job opportunities, etc.; digital collections, resources or datasets; events, conferences, lectures and seminars; contents directly reported on the official webpage; courses; FAQs; guidelines; presentations (slides); projects participation/deliverables/results/apps; publications (articles, books, journals); reports; enabling technologies (app, tools, services); toolkits/handbooks/step by step guides; videos; webinars; workshops; other (e.g., glossary or other specific types).
- **MANAGEMENT: *How is access to services managed? What is the primary and/or secondary access point?*** The list includes two main options: the official webpage and its specific section (thus, header and/or footer toolbar menu, dedicated sections) and/or dedicated platforms (repository, software or other web page), internal or external.
- **ACCESS CONDITIONS: *Is registration or affiliation required to access the service? Are the services free and/or under fee access?*** The options included aim to describe if registration is required, not required or optional (e.g., giving access a pro-version); and if the access is free/open, under fee, reserved to consortium members, fellows or collaborators of the centre.
- **LANGUAGE: *In which language(s) are the services/content/resources provided?*** The list informs three possible options: English(only), multiple languages besides English, the language of the country of origin of the centre (only).
- **LINKS: *Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres?*** The options refer to the use of only 'internal' content/resources (with links to different sections of the official

webpage and/or repositories), and external links to other webpages or platforms, software, resources, etc.

- **LEVEL: *What is the level of services/resources?*** The options describe if the level of the service - considering aim, required expertise/skills and type of resources provided - is intended for professional or non-professional use.

The last three variables refer only to the training service.

- **DELIVERY MODE: *How are the teaching modules delivered?*** The options describe different access modalities to learning courses and materials: in presence (face-to-face); blended; online/distance learning - asynchronous distance learning; synchronous distance learning; real-time distance learning/streaming.
- **TIMING: *What is the average duration of the teaching modules?*** The options cover possible timings: 5-15 minutes, 15-30 minutes, 1 - 2 hours, 1 day (4/6 hours), more days/training period.
- **CREDITS: *Does the centre recognize training credits or certificates of attendance?*** The options foreseen a yes or no answer.

A factsheet of synthesis, matching services and variables, has been set up and filled in for each centre (See T4.1 Appendix 1 and Table 2.4, as example). The same data have been reported in an additional synthesis framework including all case studies, supporting final and comparative considerations (T4.1 Appendix 2). In the table the variables are listed in alphabetical order within the fields identified, and aim to feature the description of different types of services, pointing out how they can be provided, managed and delivered in very various ways.

Table 2.4. Factsheet of analysis matching services and variables identified (example from DANS analysis).

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS	
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....
		About	Legal	News	Events	Social	Newsletter			
										<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2.?</i>
										Public and private heritage institutions responsible for managing monuments and sites
										Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professionals and SMEs providing services for preservation, conservation and restoration
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Companies from the creative industry producing heritage-based content, apps, games, education and tourism services
										Museums curators
										Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional researchers
										General and educational users and visitors, tourists
										Others
										<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>
	<input checked="" type="radio"/>								<input checked="" type="radio"/>	Direct contacts (e-mail /Phone number)
	<input checked="" type="radio"/>									E-mail
							<input checked="" type="radio"/>			Focus Groups/taskforces/Thematic Departments
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus/Dedicated Pages
	<input checked="" type="radio"/>									General contact (Phone number)
								<input checked="" type="radio"/>	<input checked="" type="radio"/>	Specific software/tool
<input checked="" type="radio"/>	<input checked="" type="radio"/>			<input checked="" type="radio"/>		<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	Text Form

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS	TYPE OF RESOURCES/CONTENTS <i>What are the types of content, activities and resources through which the services are provided?</i>		
	2.1 Contacts/Help	2.2. Communication									2.3. Dissemination	2.4. Orientation, Guidance and...
		About	Legal	News	Events	Social	Newsletter					
										Best practices and Case studies		
										Blogs		
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Calls/ application (scholarship, Job opportunities, etc.)		
				<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	Digital Collections/Resources/Datasets		
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Events/ Conferences/Lectures/Seminars		
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Contents from the official web page		
	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		Courses		
										FAQs		
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Guidelines		
										Presentations (slides)		
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Projects participation/deliverables/results/apps		
							<input checked="" type="checkbox"/>			Publications (Articles, Books, Journals)		
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Reports		
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Technologies (app, tools, services)		
								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Toolkits/Handbooks/Step by step guide		
								<input checked="" type="checkbox"/>		Videos		
								<input checked="" type="checkbox"/>		Webinars		
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		Workshops		
										Other		
<b>MANAGEMENT</b> <i>How is access to services managed? What is the primary and/or secondary access point?</i>												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Official Web page		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Header bar (Home page)		

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...	
		About	Legal	News	Events	Social	Newsletter				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			- Footer bar (Home page)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- Dedicated section/page
								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Dedicated Platform (internal): repository/ software /other web page
						<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page
<b>ACCESS CONDITIONS</b>											
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>											
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration required
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration Not required/foreseen
											Optional Registration (to access a pro-version)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Free
									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Under Fee
										<input checked="" type="checkbox"/>	Consortium members / Fellows/ Collaborators
<b>LANGUAGE</b>											
<i>In which language(s) are the services/content/resources provided?</i>											
						<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	English (only)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Multiple languages, besides English
								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Language of the country of origin (only)
<b>LINKS</b>											
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>											
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Internal contents
			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Link to external pages or resources
<b>LEVEL</b>											
<i>What is the level of services/resources?</i>											
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Professional

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enablig Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter				
						<input checked="" type="radio"/>					
										Non professional	
										<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>	
								<input checked="" type="radio"/>			In presence
								<input checked="" type="radio"/>			Online/Distance
											Asynchronous distance learning
											Synchronous distance learning
											Real-time distance learning/Streaming
								<input checked="" type="radio"/>			Blended
										<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>	
											5-15 minutes
											15-30 minutes
								<input checked="" type="radio"/>			1 – 2 Hours
								<input checked="" type="radio"/>			1 Days (4/6 hours)
								<input checked="" type="radio"/>			More Days
										<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>	
								<input checked="" type="radio"/>			yes
								<input checked="" type="radio"/>			no

#### **2.2.2.2. Case studies**

The detailed analysis of the nine case studies, selected as representatives of the macros and sub-families identified within the T2.1 (WP2) activities, was carried out with the aim of understanding and extracting indications on how these centres - which operate in the field of cultural heritage and offer a broad portfolio of services similar to the future CC one - present, manage and give access to their services.

The research has supported the more detailed definition of the categories of services that 4CH will offer and the understanding of the different and multiple ways through which the same service can be provided, and which are the variables that influence its fruition.

The ways of providing and giving access to services were analysed by identifying categories and sub-categories that would facilitate their study, despite the close links between them. Other aspects, considered as relevant, were included although not explored in detail - for instance, the legal form, financing incomes and the availability of documents related to the financial statements - so as to provide other WPs (in particular WP6) a useful reference for their research activities.

The detailed analysis of the nine case studies - available as T4.1 Appendix 1 - include: a brief abstract listing some general aspects affecting the service management (profile, mission, audience, services, financial income); the full description of access procedures to services; the factsheets of analysis; and transversal considerations among the overall portfolio of services and variables considered (e.g., users, supporting tools, management, language, links, etc.). The information was collected from the institutional pages and the factsheets attached to Deliverable D2.1 (curated by the various partners) and re-elaborated for research purposes.

The data resulting from the comparative analysis, collected in the synthesis framework (T4.1 Appendix 2 *Case studies: synthesis framework*), do not provide relevant results in quantitative terms (considering the low number of cases, statistically seen) but nevertheless allow comparative and transversal considerations on the categories of services, as identified by T4.1.

### **1. PRESENTATION OF SERVICES**

The centres analysed describe the portfolio of services and activities on their official webpage, which represents the main point of access to all information, mainly through the use of curated content directly reported on free/open access pages, not requiring user registration.

It is possible to identify some common operational modalities, such as the translation of content into several languages - with the official language always set as the standard option - to make at least the general information accessible.

In addition, the services are divided by clearly identified categories (e.g., guidance, training, dissemination, events, research, etc.), by type of resource (e.g., publications, project reports, tools or online services, datasets, collections, webinars, guidelines, etc.), by topics (e.g., copyright, open data, etc.), and/or by users/jobs (e.g., data providers, archeologist, researchers, journalists, teachers, students, etc.).

The services are mostly free, and in some cases require registration (login) as access condition, sometimes as an option to a 'pro' version or to more advanced applications. Other services, mainly direct consultancy, access to copyrighted publications, advanced training programs or data storage are provided upon request, are chargeable or are reserved for members or partners (a condition that often requires the payment of an economic contribution).

Collaborations and research on specific projects is typically based on an agreement/proposal between the centre and a network of partners - institutions, universities, research centres, etc. but also local communities and associations. Additional ways to access - for individuals - are described by job opportunities, internships or fellowships.

The description and the access to services, mostly for professional use, are supported by references to other contents of the official website or by direct links to external pages, software and platforms managing the access to resources, datasets and tools.

## **2. CONSULTANCY AND ORIENTATION**

Consultancy and orientation are performed by the centres through multiple services/activities, contributing to the more general objective of making users aware and informed about the use of certain procedures, technologies, applications, solutions, etc. Such sub-categories include: how to contact the centre (from providing more general email contacts and phone numbers, direct contacts of staff members, using preset text formats, to providing FAQs or instructions as a filter for direct contact on some of the services directly available online); activities and channels of communication; open access to documents resulting from research activities developed by the centre; other forms of personal/direct consultancy upon request.

### **2.1. Contacts/Help**

The contact channels use common modalities such as providing email addresses, text forms and/or FAQs (a very useful tool, if well structured, for indirect contacts).

Other information - for instance, phone numbers, direct contacts of staff members or the address of the office/headquarter - is inevitably linked to and depends on the infrastructure of the centre, primarily in terms of availability of thematic departments and/or staff employed.

### **2.2. Communication**

The various communication activities inform two main shared (and very common) categories represented by the possibility of access (and enrolling for online and/or in person events) to a calendar of events of various types (conferences, lectures, workshops, etc.), and the publication of news about the centre and its research activities.

In addition to the contents directly provided on the official webpage, the most used tools for these purposes are: social media, aimed at specific audiences and used to share content and/or resources (e.g. Facebook, Instagram and Twitter for a wider audience, LinkedIn for the professional field, YouTube or Vimeo for video contents, Slideshare or Zenodo for presentation slides, Soundcloud for audio tracks, etc.), and periodic newsletters available upon registration for a more direct contact. More outstanding tools concern blogs or online journals.

Within this broad category, other aspects such as the presentation of the centre and legal aspects/terms of use, were also analysed: the research results highlight very common operating



procedures of reporting information in dedicated and clearly identifiable sections of the webpage.

The information about the different forms of communication is always freely accessible and, with the exception of subscription to the newsletter and events, users are not required to register.

It is important to mention how the communication, in particular for the contents to which it refers, is in fact transversal and/or supports other categories identified, for instance, dissemination, training or collaborative research. Despite this consideration, it has been analysed in the context of 'Consultancy and Orientation' for its function of informing - and implicitly guiding - users on issues, topics and solutions, even if addressed by other more specific services.

The detailed information reported in the description of the individual case studies and in the working factsheets/tables have been collected with the aim of addressing operative inputs to be used in the effective definition and management of these instruments by the future CC.

### **2.3. Dissemination**

Access to dissemination activities (e.g., events, conferences, etc.) and resources (e.g., texts on the website, reports, presentations, videos, etc.) curated and promoted by the centre, also developed within projects, is generally open but follows different modalities described by the variables identified.

Documents - stored on internal or external repositories - are very often available and downloadable from the webpage. The publications are generally open access or if subject to restrictions, the terms of use and the copyright conditions are indicated. Some centres offer the possibility of direct purchase for books and journals. For videos and presentations (pdf format), external and free access platforms, such as YouTube, Vimeo, Slideshare, Zenodo, etc. are commonly used.

### **2.4. Orientation, Guidance and Consultancy**

Access to the consultancy service takes place in the following main ways: the provision of guidelines on procedures and topics for professional use in dedicated sections of the webpage, and consultancy upon request and/or for a fee. This category may also include the sharing of best practices, toolkits, handbooks or step-by-step instructions on the use of online tools, technologies for several purposes/activities (e.g., publishing) or platforms for accessing digital collections and databases.

Topics or areas of expertise within which the centres offer orientation, guidance and/or consultancy are typically well described and identifiable by users.

### **3. TRAINING AND CAPACITY BUILDING**

Training - to which chapter 3 of this Deliverable is entirely dedicated - is generally clearly identified and distinct from other dissemination activities, even if in some cases, especially for free events, lectures, etc., the border is not so clear.<sup>10</sup>

Regarding the access modalities, they are directly linked to some main variables: training objectives, possible costs and duration. The results of the analysis on the nine case studies (also considered in the next section as part of a survey on a larger sample), highlights a set of scenarios, as follows.

- Advanced training programmes (courses), often organised in collaboration with other institutions, are available upon application, admission and fee payment; attendance certificates or training credits are recognized; these programmes are often delivered face-to-face or blended and often have longer duration (several months, a year, two years).
- Professional development and updating/upskilling courses are accessible upon request or available depending on the calendar provided by the centre; registration is required, can be free and/or for a fee, have a variable duration between 1 and/or more days; in some cases are reserved to the members of the consortium, partners or internal staff.
- Face-to-face/in-person, hybrid, and online workshops, webinars (online) and in-person lectures are organised by the centres. These generally have a short duration of 30 minutes to 2 hours, but can be a half or whole day. They are usually freely accessible. Registration tends to be required, and is for the online and hybrid modes managed with the support of dedicated platforms (e.g. Zoom, Teams, Eventbrite, etc.).
- Free access teaching/learning materials, resources and tools for asynchronous (self-paced) learning in different formats (web content, documents, slides, etc.) are made available on the official webpage. Some of the centres are participating in or are developing their own self-paced online courses (e.g. moodle).
- Learning platforms providing thematic materials and resources for professional development or upskilling are free access, in some cases registration is required.
- Other training activities (e.g., study visits to the headquarters of the centre) are usually free and accessible upon request or depending on the staff availability.
- Internships and fellowships are available by application or depend on the opening of periodical calls.

Target users, training objectives, program, direct contacts and instructions for application or use and access to digital platforms (if applicable) are provided.

### **4. SUPPORT IN INNOVATION AND PROJECTS**

#### **4.1. Enabling Technologies, datasets access/storage, physical equipment**

The centres offer access to various online services that can be described according to three main categories and general conditions, as follows:

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<sup>10</sup> Strictly speaking, a training event is specifically designed for learning, with clearly defined learning outcomes and interactive parts. But many organisations also categorise webinars and lectures as 'training'.

- the consultation/browsing of curated datasets, collections or metadata from internal repositories is open access, in some cases it requires registration on the platform through which the service is provided;
- the deposit of data is sometimes free (e.g., within a certain amount of data), sometimes available for a fee or reserved to partners or affiliates;
- other services, tools, software and/or applications are accessible from the webpage and are usually free of charge for use, sometimes registration is required.

Target users, aims, guidelines and terms of use, and direct contacts are usually provided. In many cases these services are the result of research activities developed within competitive projects.

The offer of this type of service, which for some of the centres analysed represents the 'flagship' activity, is described in a clear and specific way - as occurs also for training, the calendar of events, or research. Considering that the focus of this analysis are the rules of access to the service, it was not considered appropriate to make distinctions between sub-categories (for instance, access to databases and online tools) having encountered similar conditions.

#### **4.2. Collaborative research (Projects) and Networking**

Research and participation in national and international competitive projects in partnership with various institutions, research centres or companies represent an important activity for all the analysed case studies. The results (reports and deliverables but also resulting services, datasets or tools), especially when projects have received public funding, are made available directly on the webpage or by redirecting to the official pages/platforms/tools. In other cases, the centres simply describe the project and its involvement without including other documents. The project info is usually accurately described and integrated with additional resources and/or events (presentations, videos, etc.), and data on the specific role of the centre.

The section dedicated to research is always clearly identifiable among the activities illustrated on the webpage, as are the related resources and results. The methods and conditions through which the collaborations between the centre and the partners were established are not usually described, except by public bodies who have a legal obligation to publish all administrative documents.

The networking activity is directly connected to collaborative research but also emerges from other opportunities for exchange and collaboration between the centres and their partners, for example, events, activities and conferences shared and promoted through the official communication channels, even when there is no direct involvement.

Comparing the macro-categories of target users of the centres also yields interesting and relevant observations. 'Professional researchers' and 'public and private heritage institutions responsible for managing monuments and sites' are certainly the main users accessing the most of the services offered in all three strands (both as end-users and as 'active' parties, especially in data storage and collaborative research). Other relevant categories are 'professionals and SMEs providing services for preservation, conservation and restoration'; 'companies from the creative industry producing heritage-based content, apps, games, education and tourism

services’; ‘associations, NGOs and local communities aiming at maintaining and communicating cultural heritage’; and ‘museum curators’. These are particularly relevant for the services ‘Consultancy and Orientation’ and access to enabling technologies and digital collections (‘Support in Innovation and Projects’ category). General and educational users and visitors, tourists are to be considered for more specific services (educational resources and some target dissemination events).

Further full and specific information on the access procedures for accessing the services and the variables identified for their description are available in T4.1 Appendix 1 *Case studies: factsheets of analysis* and T4.2 Appendix 2 *Case studies: synthesis framework*, attached to this Deliverable.

### **2.2.3. User needs: analysis and critical considerations on the data collected by T1.4.**

The protocols describing the rules of access to the services offered by the CC will have to take into consideration the requirements of the users to whom they are addressed, trying to cover the widest possible audience. With this aim in mind, T4.1 has conducted a critical analysis of the results reported in the [D1.2 - Initial analysis on user need](#) (submitted, May 2022), to extract useful data for understanding which users should be the main subjects accessing to specific categories of services and how the future CC will support the fulfilment of the identified needs. The in-depth study on the relation among user requirements, skills and services is still ongoing by WP1 (T.1.1, T1.4): the final results will flow into the D1.4 - *Final report on user needs* expected in November 2023.

The T4.1 analysis started with some research questions: who are the 4CH users, what/how many are their needs according to the research results (D1.2 - WP1, T1.4); which users report an ‘higher’ number of needs; what are the needs shared among several user categories; what are the needs considered as most relevant – reporting a higher-ranking rate, as results from the preliminary survey among a sample of stakeholders<sup>11</sup>; what are the fields of application of the needs mapped.

The data related to the user needs description, number of user categories involved, fields of application, CH type (artefacts/objects, monuments and sites) and ranking rates have been analysed and integrated in a unique framework (See Table 7 - T4. 1 Appendix 3): an ‘instrumental’ output informing considerations and observations. For each research question, the evidence that can be drawn from the data collected has been reported as appendix (T4.1 Appendix 3 *Users needs analysis and synthesis framework*).

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<sup>11</sup> The users’ needs survey was launched and kept active during the month of April 2022. A total of 48 responders were accounted, being 22 professional researchers, followed by 7 “others”, 6 decision-makers and national public bodies, 4 associations, NGOs, local communities and citizens, 3 professionals and SMEs, 3 public and/ or private heritage institutions, 2 companies from the creative industries and 1 museum curator. ([D1.2 - Initial report on user needs](#), p.59).

The comparison among all the different aspects analysed highlights the most frequent elements that could be taken into consideration for an assessment on the specific topics and type of services to be developed by the future CC.

The users categories reporting a higher number of needs (between 13 and 10 out of 25) are, as follows (See Table 3, T4.1 Appendix 3):

- ‘Professional researchers’ (UC08);
- ‘General and educational users and visitors, tourists’ (UC06);
- ‘Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization’ (UC02);
- ‘Professionals and SMEs providing services for preservation, conservation and restoration’ (UC03).

These categories should be certainly taken into account as relevant and/or main users accessing the services of the future CC, but considering that all user-categories have to be addressed.

The needs shared by a ‘higher’ number of user categories (between 7 and 5 out of 9) are, as follows (See Table 4, T4.1 Appendix 3):

- ‘Optimized and time-saving procedures for data capturing and processing’ (UN01);
- ‘The need of society to be actively involved in cultural heritage activities, not only as an observer but also as a creator’ (UN04);
- ‘Facilitate digital models sharing and information exchange’ (UN12);
- ‘Provision of infrastructure and services for data sharing, access and re-use’ (UN18);
- ‘Generating and customizing visualization that allow users to dynamically and creatively experience digital contents’ (UN20).

The sharing of needs between categories of users with specific (and very different) skills, abilities and interests, jobs, etc., clarifies how the services and the field of activities of the future CC (from communication, dissemination and guidance, to training, access to digital technologies and collaborative research) specifically will have to be declined, well-targeted and adapted to cover this plural condition.

The needs shared among more users are not the only ones that have been assessed as very relevant by the stakeholders involved in the survey (See Table 5, T4.1 Appendix 3), for instance:

- ‘Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible’ (UN19), rated as relevant (92% / 79%) is shared by only 3 users out of 9 - ‘Professional Researchers’ (UC08), ‘Decision-makers and national public bodies’ (UC02), ‘General and educational users and visitors, tourists’ (UC06);
- ‘Long-term preservation framework for large volumes of digital data’ (UN21), rated as relevant (88%), covers just 1 user out of 9 - ‘Professional Researchers’ (UC08);
- ‘Availability of digital archiving standards’ (UN22), rated as relevant 88%, covers 2 users out of 9 - ‘Professional Researchers’ (UC08) and ‘Decision-makers and national public bodies’ (UC02).

The most shared needs among more categories of users will certainly provide the CC with a sort of order of priority or a 'guide indicator' to define its portfolio of services. However, the results of the investigation among the stakeholders involved, clarifies how requirements related to very specific activities should be addressed and covered - as evaluated as very relevant and/or urgent - and reflects how needs from other user categories (sharing a reduced number of needs) are less expressed.

The most shared needs refer to more than one field of application. 'Technologies/models' and 'Digital Archives' represent the most shared fields linked to the mapped needs (See Table 6, T4.1 - Appendix 3), as follows:

- 'Technologies/models' (19 needs out of 25);
- 'Digital Archives' (11 needs of of 25)
- 'Knowledge Sharing And Visualisation' (8 needs of 25)
- 'ICTs in Museum' (4 out of 25)
- 'Education' (3 out of 25).

The datum resulting from the crossing between users, needs and field of application reaffirms the transversal condition of the requirements identified, to which the CC will have to respond considering the different levels of the users involved. Furthermore, the fields of application reflect the main focus that the CC will hold in the field of conservation, preservation and dissemination of Cultural Heritage, i.e. digitization.

### 2.3 Workflows to access CC services

With the Task 4.1 main objective of defining rules for accessing the services of the future CC, we have chosen to describe these rules by modelling them into a workflow. Within this workflow, the rules are described as a sequence of actions that the user will need to follow to access CC services. For the identification of the required actions, we have considered the results that emerge from the nine case studies presented in Section 2.2.2 above, since these have been selected for the acknowledgment of the rules. Moreover, considering that browsing and searching through massive online portals emerged as a challenge related to high importance user needs (as indicated by the user needs analysis in [D1.2](#)), and that the 9 case studies are not representative enough regarding access to portals, two typical portals, namely ARIADNEplus<sup>12</sup> and PARTHENOS<sup>13</sup>, have been studied and contributed to the specification of the workflow as well.

During the identification of the required actions to access CC services, we have established a set of parameters that affect the general sequence of actions and lead to variations of the general model. Four parameters have been established as follows:

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<sup>12</sup> <https://portal.ariadne-infrastructure.eu/>.

<sup>13</sup> <https://www.parthenos-project.eu/portal>.

1. **User categories:** The categories of users, as identified by T1.4, affect the type of access provided to the user and the type of responsiveness of the CC – either automatic or interactive. Independent users (e.g., categories ‘General and educational users and visitors, tourists’ - UC06, ‘Professional Researchers’ - UC08) are expected to be mostly served by accessing the knowledge base of the future CC through its web interface in an automatic way and for a predefined set of available services. On the other hand, there is a high possibility that big organisations like national public bodies and big heritage institutions (categories UC01, UC02) will request access to more complex services, which may not be adequately served through the web interface. It is therefore necessary to provide the potential of responding interactively in such cases.
2. **Service categories:** Similarly, the category of service for which access is requested affects the way that CC will respond, in conjunction also with the previous parameter. ‘Consultancy and Orientation’, ‘Training and Capacity Building’, ‘Support in Innovation and Projects’, as macro-categories of services defined in Table 2.3 above, have an impact on the way the access will be provided and the way that the CC will serve the requests. For example, access to a specific digital tool (‘Support in Innovation and Projects’ category) would require the execution of a series of steps according to a digital manual, while for a training programme (‘Training and Capacity Building’ category) the potential of following an in-person procedure should be provided in the workflow.
3. **Access type:** Remote or on-site. Though on-site access of services has not been discussed so far, this parameter foreseen here gives the potential of serving interested parties in the future by redirecting them to 4CH National Nodes.
4. **Charging:** Application of charging fees from the CC has not been considered so far. However, in order to provide the potential of applying fees for specific services and/or user categories in the future, actions regarding charging have been included in the workflow. In cases where charges are not applicable (free access to services provided), all corresponding actions related to their application within the workflow can be eliminated by applying charging fees equal to 0.

The abstract model containing the sequence of the identified actions, which are subject to the aforementioned parameters, is illustrated in Figure 2.5 below. The model is presented as a UML<sup>14</sup> activity diagram with swimlanes. The user (regardless of the category she/he belongs to) expresses the need to access a service and the CC responds to the user, either automatically or interactively, by displaying a list of available services. This could be achieved for example by presenting a sorted list with filtering options or by querying the knowledge base with specific criteria. The user explores the list of services and finds a candidate service - (or else the addition of a missing service can be suggested). The future CC then provides general information about the service (aim, input, output, method of application, etc.), which is also accompanied by a service manual describing in detail its specific characteristics (software/hardware requirements, authentication procedure, required expertise, etc.). The

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<sup>14</sup> Unified Modeling Language (UML). UML activity diagrams are commonly used for the description of sequences of actions w.r.t. a process and/or a system.

interested user, after studying the description and the manual, selects the required service. If charging issues are applicable, the CC informs the user about the cost and if it is accepted, the fee is charged accordingly. Please note here that in case a service is offered without charges, a fee equal to zero can be applied to the workflow without affecting the validity of the sequence of actions. Following charging, the user adopts the service and is ready to use it, either after receiving help from the CC for its usage or not. Due to its complexity, the use of service is highlighted in blue: it constitutes a complex action requiring a service-specific workflow to describe it in detail. Before completing the workflow, the user evaluates whether the solution adopted is satisfying according to her/his needs and decides accordingly to complete the procedure or repeat it to select a new service.

The abstract model can then be adapted to each different case by providing specialisations of the generalised actions included and leading to variations of the abstract model.

By way of example, we provide two different specialisations in Figures 2.6 and 2.7, both deriving from the abstract model (Figure 2.5) after applying different values to a subset of its parameters and leading to different variations of the model.

More precisely, we describe the sequence of actions required to provide access to:

- I. an **individual user** that requests **remote access** to an **online service without charging fees** (Figure 2.6), and
- li. an **organisation** requesting **remote access** to a **training service with charging fees** (Figure 2.7).

The two specialisations are expressed again as UML activity diagrams with an additional swimlane. The three lanes employed distinguish the actions required to be performed by

- I. the user,
- li. the CC in an automatic way, and
- lii. the CC interactively.

As illustrated, besides the charging actions that are omitted in the first example as non applicable but remain in the second, the latter also leads to a specialisation that requires greater interaction from the CC (complex service-specific action in the CC interactive swimlane).



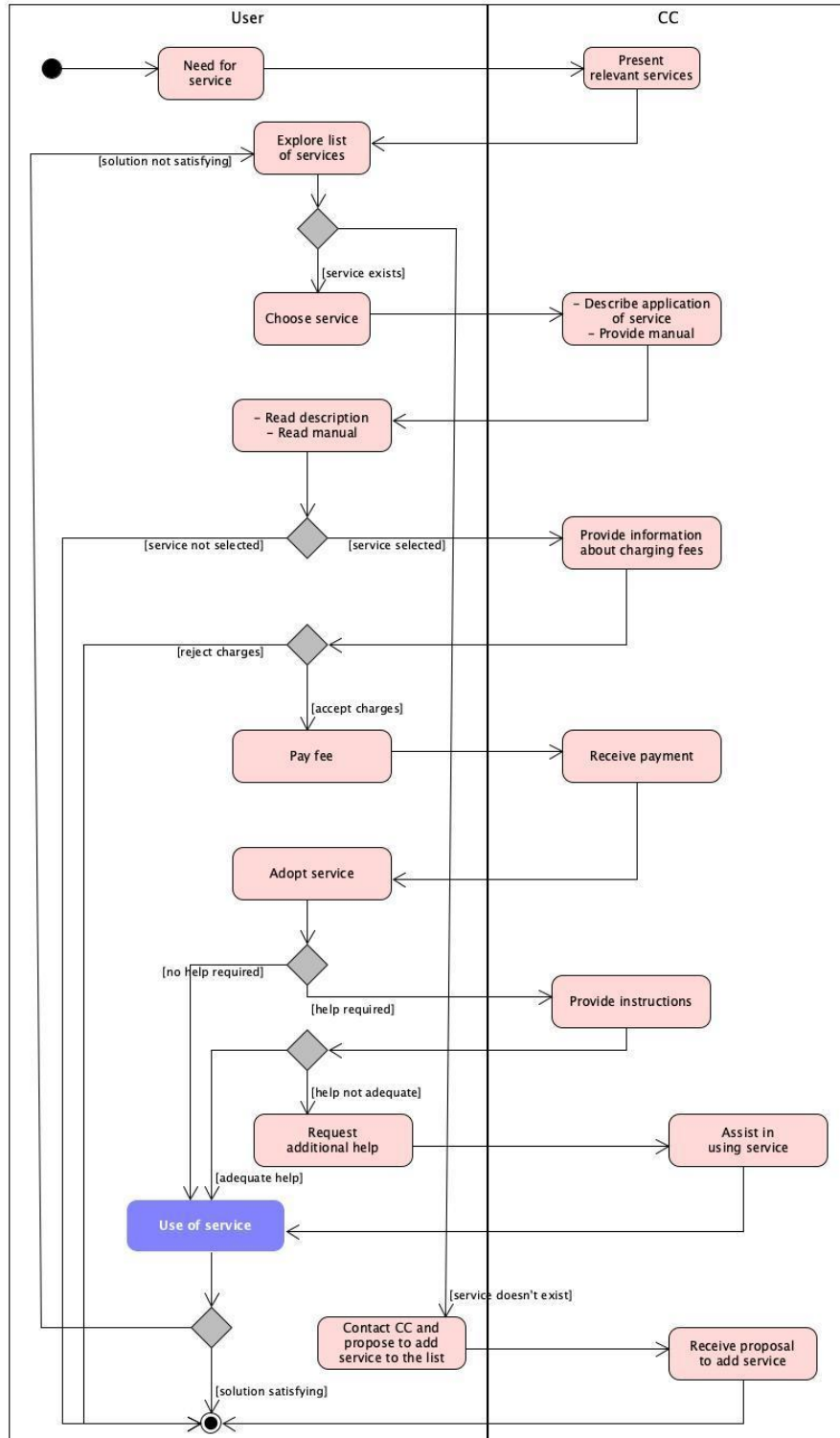


Figure 2.5. Abstract model containing the sequence of the identified actions to access CC services.

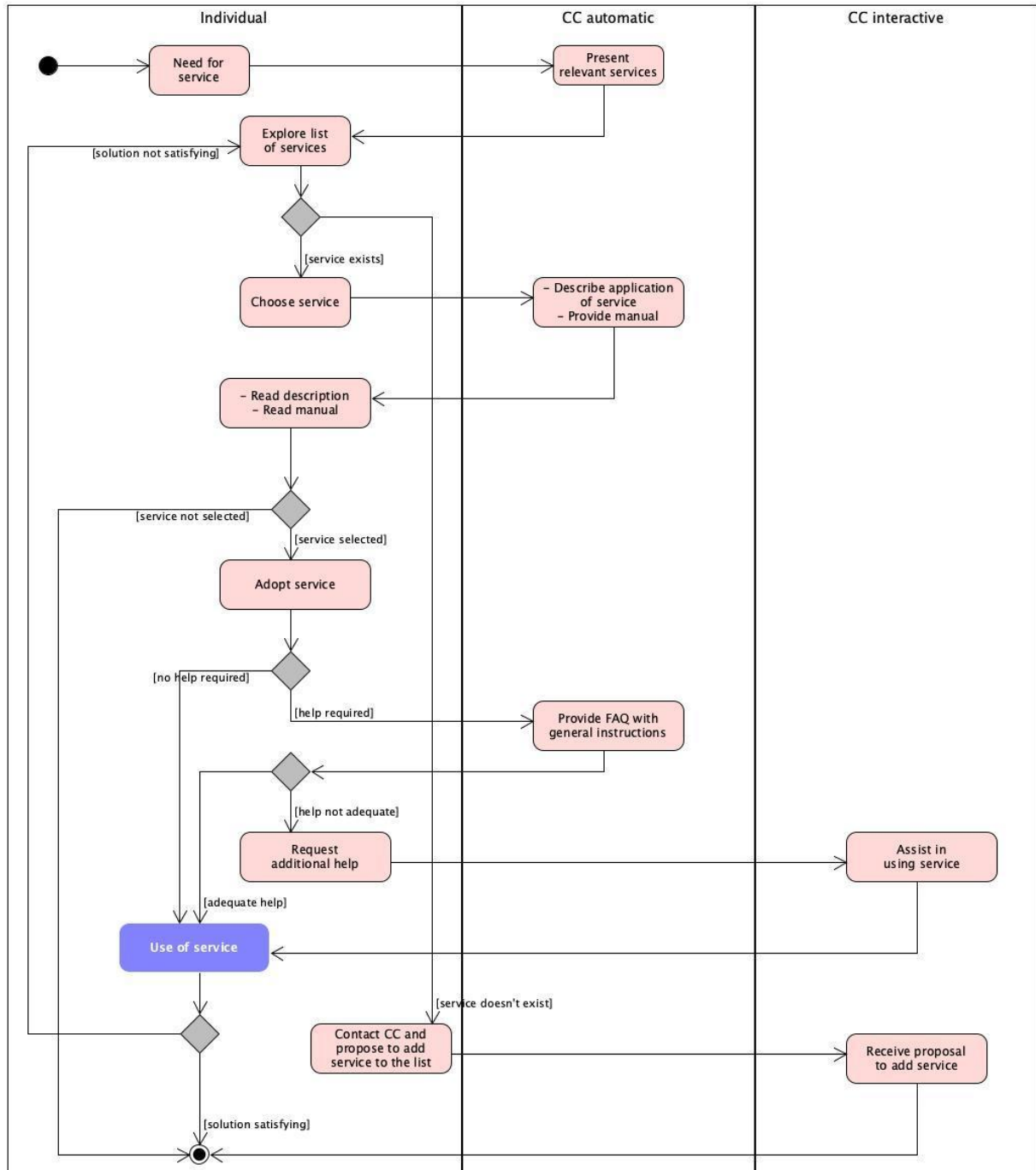


Figure 2.6. Workflow specialisation 1: an individual user that requests remote access to an online service without charging fees.

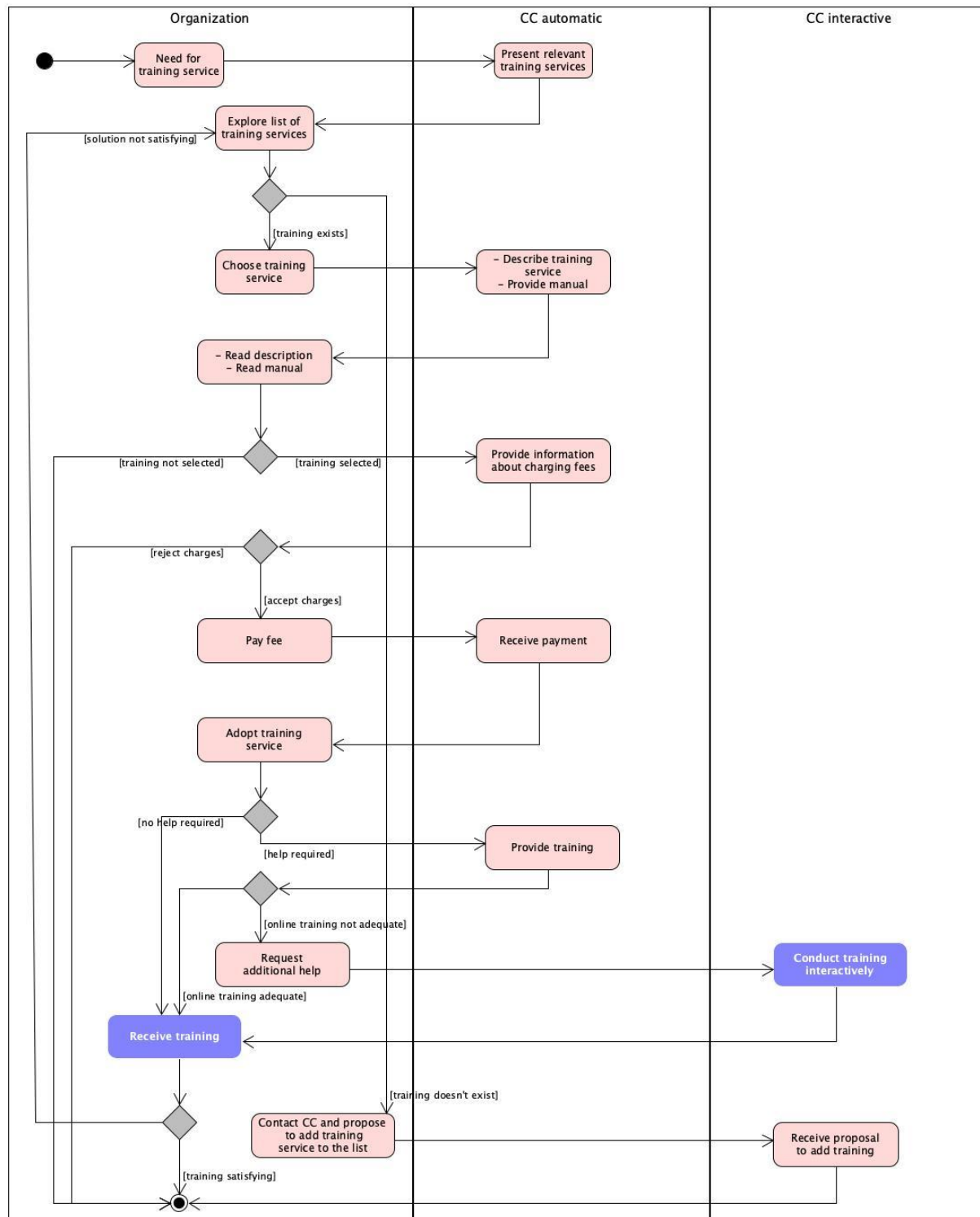


Figure 2.7. Workflow specialisation 2: an organisation requesting remote access to a training service with charging fees.

## 2.4 Summary of recommendations and conclusions

The 4CH project relies on Task 4.1 for the study and the definition of procedures and protocols, profiled for target users, considering the different levels of access to the services that will be offered by the future CC, including consultancy and orientation, training and capacity building, support in innovation and projects. Thus, the contents included in this chapter 2 describe the essential analysis and recommendations background, and frames the access rules/procedures to the CC services and their main variables (type of user requiring access, type of services, and type of access condition).

The activities of the task, due to its strong and direct links with other 4CH actions, have built upon a critical systematisation of the results achieved so far within the project, in particular: the in-depth study of a selection of case studies included in the Report on CCs (D2.1, WP2, T2.1) and the results of the user needs analysis (D1.2, WP1. T1.4).

The lessons learnt from the nine case studies have supported a more precise definition of the macro-categories of services and the identification of a framework of variables that influence the access methods. On the other hand, the critical reading of the main categories of users and related requirements from T1.4, returned information on which users share common needs and underlined the importance of considering all categories and mapping even 'less' evident needs.

The definition of the access rules presents further and strong links with other ongoing 4CH activities with respect to which it has to move coherently, receive but also offer inputs. Such links refer in particular to WP3, aimed at the implementation of the 4CH operational platform, including the 4CH Knowledge Base and other applications, and WP6, defining the financial and legal infrastructure of the CC, its business and sustainability plan. The inputs from the preliminary analysis and the overlaps with the other project activities have been taken into consideration for the drafting of workflow represented as an abstract model that describes the sequence of the main steps and actions to be performed for accessing the CC services. The abstract model allows it to be adapted and specialised for individual services, according to the functioning of the platform and other 'indirect' aspects, such as the economic and legal nature of the CC.

The research results make it possible to outline a **preliminary program of the services** offered by the CC, methods of access and use. A more detailed list that includes considerations on other aspects among those considered in the analysis is provided as an appendix (T4.1 Appendix 4 *4CH services: preliminary program*). These aspects, which will be fine-tuned in the next phases of the project - in relation to legal form, governance and business plan - include registration, charging (if applicable), language, possible additional supports, management

(whether by the European competence centre or national coordination nodes), related Thematic Department<sup>15</sup>, and when they will be available.

Table 2.5. 4CH services organised in the three strands: the list, complete with additional information (e.g., registration, management, etc.), is available as T4.1 Appendix 4. [KB=4CH Knowledge Base]

<b>CONSULTANCY AND ORIENTATION</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>PRESENTATION OF SERVICES</b>	<b>Present the list of services provided, describe the access conditions, redirect to the dedicated section/s or access point/s</b>	Remote	Automatic	Official website dedicated section (General info)
				<b>4CH platform</b> <sup>16</sup> for specific services (online tools, Cloud and KB)
<b>CONTACTS/HELP</b>	<b>Receive contacts and provide information (including manuals) on services access and provision.</b>	Remote	Automatic	Official website dedicated section (General info)
			Interactive (support on specific requests)	4CH platform for specific services (access to online tools, Cloud and KB)
<b>COMMUNICATION</b>	<b>Provide general info (mission, governance, partners, departments, statements, etc.)</b>	Remote	Automatic	Official website dedicated section
			Interactive (support on specific requests)	
	<b>Organise, provide and disseminate events and news on CCs activities, topics of research, etc.</b>	Remote	Automatic (for info provision)	Official website dedicated section (General info)
			Interactive (for specific requests and event/s delivery)	Online platforms (e.g., Zoom) (for delivery)
			On-site Blended	Interactive (for specific requests and event/s delivery)
<b>Newsletter</b>	Remote	Automatic	Official website dedicated section (for subscription)	

<sup>15</sup> For the Departments, reference is made to the preliminary list reported in the project proposal which includes: Sciences and Technologies, ICT and 3D, Training and education, Policies and Strategies, Financial Department.

<sup>16</sup> See 4CH Deliverables: D3.1 Design of the CH Cloud and 4CH platform and D3.2 Integration of the INCEPTION 3D and H-BIM technologies.

<b>CONSULTANCY AND ORIENTATION</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
	<b>Provide info on legal and privacy policies</b>	Remote	Automatic  Interactive (for specific requests)	Official website dedicated section
<b>DISSEMINATION AND KNOWLEDGE SHARING</b>	<b>Give access to documents and resources concerning the ECC and NCCs research activities</b>	Remote	Automatic	Official website dedicated section (General info) 4CH KB catalogue (remote access to metadata of resources)
<b>ORIENTATION, GUIDANCE AND CONSULTANCY</b>	<b>Give support, Advice and consultancy on specific topics/issues through guidelines, protocols and guidance documents, or through direct contacts.</b>	Remote	Automatic	Official website dedicated section (General info) 4CH KB catalogue (remote access to metadata of resources)
			Interactive (for specific requests)	Official website dedicated section

<b>TRAINING AND CAPACITY BUILDING</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>TRAINING</b>	<b>Provide and give access to training programme, courses and resources</b>	Remote	Automatic	Official website dedicated events section (general info) and dedicated training providers page
		Remote	Automatic	4CH KB catalogue (remote access to (metadata of) resources). New materials deposited in external platforms, e.g. Zenodo.
		Remote	Interactive	Online platforms (e.g., Zoom)
		Blended On-site	Interactive	Other physical sites (plus online platforms)

<b>SUPPORT IN INNOVATION AND PROJECTS</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>ENABLING TECHNOLOGIES, DATASETS, PHYSICAL EQUIPMENT</b>	<b>Give access to specific digital applications/tools/technologies.</b>	Remote	Automatic  Interactive (support on specific requests)	Official website dedicated section (general info) 4CH platform and 4CH Cloud

SUPPORT IN INNOVATION AND PROJECTS				
Type of service	Description	Type of access (Remote/On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)
	<b>Give access to digital repositories/collections/datasets</b>	Remote	Automatic	Official website dedicated section (general info)
			Interactive (support on specific requests)	4CH KB catalogue (remote access to metadata of resources)
	<b>Give Access to specific physical equipment (if applicable)</b>	On-site	Interactive (Upon request)	Official website dedicated section (general info)
<b>COLLABORATIVE RESEARCH, NETWORKING, POLICY MAKING</b>	<b>Create interdisciplinary networks and Present involvement in research projects and make available projects outputs and results</b>	Remote	Automatic	Official website dedicated section (general info)
			Interactive (support on specific requests)	4CH KB catalogue (remote access to metadata of resources)

Building on these bases, considering the main categories of services identified ('Consultancy and Orientation', 'Training and capacity building'<sup>17</sup>, 'Support in Innovation and projects') and the need to be aligned and consistent with still open and under development project activities, some recommendations on the access procedures to the 4CH services have been drafted, covering the above-mentioned aspects in a cross-cutting way.

- **The first point of access to the CC services: the 4CH official website.** The general presentation of the activities (also in terms of open to public events) and services promoted and made available by the future CC can be managed directly from the official page (<https://www.4ch-project.eu/>), including information on the mission, governance and thematic departments to be reported in the various curated sections. Other communication channels, already used in the project phase, may be maintained and/or implemented, such as social channels (Twitter and Vimeo).
- **Access to online services and data collections: the 4CH operational structures.** Access to online services will be managed through the 4CH platform, of which the interface is still being defined within WP3. The same platform will allow users to consult the resources produced during the project stage stored in the Knowledge Base (KB), which is also under development. A summary of preliminary information on the functioning of the 4CH KB are reported below, while more detailed information on which services will be provided through the platform is reported in *D3.1 Design of the CH Cloud and 4CH platform* and *D3.2 Integration of the INCEPTION 3D and H-BIM technologies*. The final implementation of the

<sup>17</sup> More detailed information on the training service is given in section 3- *Training services on the field of activities identified* of this Deliverable.

4CH operational structures will be reported in D3.3 *Final report on services and tools* (expected at month 36, December 2023).

#### *The 4CH Knowledge Base*

The 4CH Knowledge Base is an information system and a smart catalog, equipped with advanced semantic functionalities, in which the description and metadata of all the documentation and data relevant to 4CH and its purposes, generated within the project (and thus, stored in the 4CH infrastructure) or present in different systems and repositories, is indexed, integrated and efficiently organised.

The KB is intended to implement a centralised hub to provide a single access point to information relevant to the 4CH Competence Center and for all scholars and experts involved in the study, conservation, preservation and valorisation of Cultural Heritage.

The aim is to create a system in which high-quality metadata, integrated and organised according to an efficient and comprehensive ontology (the 4CH Ontology, under development by the project), are queried and used to provide valuable answers to relevant scientific questions and to retrieve resources essential for research activity.

In particular, users can browse the catalogue of the aggregated resources and use the various facilities provided by the Knowledge Base, for example to:

- Retrieve and access heritage (e.g., historical, artistic, archaeological) documentation concerning cultural entities
- Retrieve and access heritage science documentation concerning analysis and scientific investigations performed on cultural objects
- Retrieve guidelines, procedures and protocols for implementing the digitization processes (e.g. for creation of 3D models, images, multimedia ecc.)
- Retrieve standards, models and ontologies for data and metadata encoding
- Retrieve thesauri and controlled vocabularies for information standardisation and enrichment
- Access, browse and download 3D models, images, videos and other multimedia objects concerning cultural entities
- Accessing and using tools and services for creating and managing digital objects and metadata
- Find and browse methodologies, procedures, policies and best practices
- Retrieve pilots and use cases
- Retrieve information about training opportunities for courses
- Find training and courses material
- Retrieve information on existing DigitalTwins of particular cultural entities
- Define the Heritage Digital Twin of cultural (tangible and intangible) entities
- Query, use and manage the Digital Twin of a cultural (tangible or intangible) entity



A first prototype of the Knowledge Base and its data entry and information search interfaces has been developed and is being tested on different datasets contributed by the various 4CH work packages, especially concerning information on publications, scientific analyses, 3D and virtual models, and training materials.

A stable version of the Knowledge Base will become operational at the launch of the CC and will contain all the information made available by 4CH. Subsequently, it will be updated and integrated with data for all materials that will become available when the CC is fully operational.

- **Terms of access and services management: dependence on legal form and business plan.**

The conditions of access to the services (free of charge, special discounts/benefits and/or request for payment) for users (both members and non-members) will directly depend on the legal form, financing incomes and the business plan of the future CC - aspects currently under development within WP6 activities (D6.1 - *Governance and legal structure description* and D6.2 *Strategic and Business plan and financial provisions* are expected to be internally submitted at month 30 - June 2023). The definition of such aspects – and in particular the business plan - will lead to the detailed identification of the required data and cost items (e.g., financing funds, basic management costs of the organisation, costs associated with the offer of a specific service, specific fund amount for the long-term operation of services, etc.). At this stage - also considering what has been observed from the case studies - some possible scenarios can be drawn up. In relation to the legal form, for instance, membership associations usually offer benefits to their members ranging from early-bird bookings to discounted rates for paid events; not-for-profit legal entities typically offer services at cost price (cost coverage may include a part of the association's running costs, as well as the cost of a specific event may include a share of the running costs of the association in addition to the cost of a specific event); for-profit legal entities charge a fee for services, with the goal of seeking a profit.

Additional considerations can cover the costs of services, considering the three macro categories identified.

‘Consultancy and orientation’ refers to the provision of expertise and other administrative costs that include, for example, travel costs, advertising, insurance, and/or access to facilities/laboratories (if applicable).

For ‘Training and capacity building’, in addition to personnel, advertising and administrative costs, it is necessary to consider cost items generated by the provision of training material, staff, costs of registration and/or training platforms (e.g., Eventbrite, Zoom or similar), location and subsistence costs (for in presence events), travel budget, etc.

‘Support in Innovation and Projects’, in particular for the platform (managing all the digital services) and the development of a repository for the long-term preservation of data, involves costs to be taken into account for the personnel involved in the development and maintenance of the platform, other costs related to software, hardware, security systems, backups, etc.

- **Initial National Coordination Centres program of services**

As already mentioned in the 1.2 “Correlation between Tasks and WPs” paragraph, this Deliverable is strictly linked to others, already delivered or to be produced, especially by WP2 and WP6. These documents will be at the basis of the CC and will affect its operational organization. In particular, the following Deliverable are the ones that will influence the shape of the European Competence Centre (ECC) and the National Coordination Centres (NCCs):

- D4.2 Report on service deployment and training (M28)
- D6.1 Governance and legal structure description (M30)
- D6.2 Strategic and Business plan and financial provisions (M30)
- D2.2 Report on the planned organization of the Competence Centre on Cultural Heritage (M36)

The texts of these four deliverables will directly contribute to the drafting of the agreements, statutes and regulations of the future ECC and its NCCs.

From the coordination activities with the supramentioned WPs and the research made by T4.1 and T4.3 emerges that the European CC will manage the access and use of the main services through its operational structures (platform, Cloud and KB), and will support the National Coordination Centres that will progressively be established. In the meanwhile the European CC structure is being shaped by WP2 (operational organization and Departments), by WP6 (legal and financial aspects) and by the other WPs that contribute to define the scientific basis and operational tools, the 4CH project aims also at configuring the organization and services of scheme-type national nodes.

Thus, in addition to drafting the preliminary program for services to be provided by the ECC (Table 2.5 and T4.1 Appendix 4 *4CH services: preliminary program*), T4.1 proposes, in the table 2.6 below, a first selection of services to be managed by a typical National Coordination Centre. NCCs can be structured as multi-centre nodes, distributed at the national/regional scale, linked to already existing local institutions, activities and excellence services, also according with the specificities of the local contexts and CH main actors.

Following the same structure of the general scheme reported as T4.1 Appendix 4, the table 2.6 describes a list of services expected to be launched in the first period of the NCCs operation. It is an open list, that will be improved and updated in the following phases of the project, incorporating and acknowledging the results of the other Tasks and WPs.

Table 2.6. *4CH services and activities managed by the National Coordination Centres (preliminary program).*

<b>CONSULTANCY AND ORIENTATION</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>PRESENTATION OF SERVICES</b>	<b>Presentation of the services provided by the NCC, describe the access conditions, redirect to the dedicated section/s or</b>	Remote	Automatic	Official NCC website dedicated section

<b>CONSULTANCY AND ORIENTATION</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
	<b>access point/s</b>			
<b>COMMUNICATION DISSEMINATION AND KNOWLEDGE SHARING</b>	<b>Information on the NCC (specific mission, governance, partners, departments, statements, etc.)</b>	Remote	Automatic  Interactive (support on specific requests)	Official NCC website dedicated section
	<b>Documents and resources concerning the NCCs research activities</b>	Remote	Automatic	4CH KB catalogue (remote access to metadata of resources)
	<b>Organization, provision and dissemination through events (conferences, lectures, workshops, etc.)</b>	Remote	Automatic (for info provision)	Official NCC website dedicated section
			Interactive (for specific requests and event/s delivery)	Online platforms (e.g., Zoom) (for delivery)
		On-site Blended	Interactive (for specific requests and event/s delivery)	Physical sites (for delivery)
<b>ORIENTATION, GUIDANCE AND CONSULTANCY</b>	<b>Development of digitisation processes guidelines (including 3D) supported by demonstrative samples</b>	Remote	Automatic (for info provision)  Interactive (for specific requests)	4CH platform and 4CH KB catalogue (remote access to metadata of resources)
	<b>Risk analysis and risk maps</b>	Remote	Interactive (on specific requests)	4CH platform
	<b>Monitoring of interventions on CH assets</b>	Remote On-site	Interactive (support on specific requests)	Official NCC website dedicated section
	<b>Validation of existing datasets and 3D models according to 4CH standards and data reuse protocols</b>	Remote	Interactive (support on specific requests)	Official NCC website/ dedicated section

<b>TRAINING AND CAPACITY BUILDING</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/ On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>TRAINING</b>	<b>Training, upskilling and educational activities (including PhDs, research grants, etc.) on digitisation, 3D modeling, survey techniques, CH conservation and valorisation technologies, sharing best practices and case studies.</b>	Remote	Automatic (for info provision)  Interactive (for specific requests)	Official NCC website/ dedicated events section (general info) and dedicated training providers page
		Blended On-site	Interactive	Other physical sites (plus online platforms - e.g., Zoom)
	<b>Accreditation/certification of existing training courses and tools</b>	Remote	Automatic (for info provision)  Interactive (upon request)	Official NCC website/ dedicated section

<b>SUPPORT IN INNOVATION AND PROJECTS</b>				
<i>Type of service</i>	<i>Description</i>	<i>Type of access (Remote/On-site/ Blended)</i>	<i>Modes (Automatic/ Interactive)</i>	<i>Main Access point/s (Official Website, specific platform/s, other web pages)</i>
<b>ENABLING TECHNOLOGIES, DATASETS, PHYSICAL EQUIPMENT</b>	<b>Cloud services (data storage)</b>	Remote	Automatic  Interactive (support on specific requests)	Official NCC website / dedicated section (general info)  4CH platform (access to online service)
	<b>Online emergency services and remote monitoring on monuments and sites at risk</b>	Remote	Automatic  Interactive (support on specific requests)	Official NCC website / dedicated section (general info)  4CH platform (access to online service)
<b>COLLABORATIVE RESEARCH,</b>	<b>Networking and support for the participation in competitive</b>	–	–	–

SUPPORT IN INNOVATION AND PROJECTS				
Type of service	Description	Type of access (Remote/On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)
<b>NETWORKING</b>	<b>research projects</b>			
	<b>Recruitment and engagement of CH national, regional and local stakeholders (National Community)</b>	–	–	–

- **Accessibility: the main variables involved.** In relation to services accessibility, it is important to remark that the future CC on Cultural Heritage is called to respond to the needs of a wide audience, taking into account the different users' level (professional or not), areas of expertise, skills, available technological supports, and language. The analysis on case studies and users requirements shows how some categories (in particular professional researchers or organisation producing datasets or digital contents/resources) can be considered as primary or main users of specific services, in particular when defined skills or competencies are required (e.g., digital tools or browse/deposit of datasets). Nevertheless, considering the aim of opening up to the general public (including students, tourists, teachers and professors, or citizens), making information accessible represents a crucial step and a major challenge.

Several variables apply to the three macro-categories and influence accessibility, ranging from how the services are presented and made available in terms of supporting structures (software/platforms), type of resources (documents, apps, videos, etc.), main access point (official webpage or other external platforms), conditions (registration and/or charging), language, and so forth. The information on the access conditions to services that foreseen the use of digital technologies/apps ('Support in Innovation and Projects'); guidelines and dissemination resources, events, etc. ('Consultancy and Orientation'); and learning programmes and materials ('Training and Capacity Building'), should be described in a clear manner, specifying to those users who are targeted, with what objectives, under what conditions of access (e.g., registration, fee payment, software download, etc.), providing training toolkits or manual (if necessary/applicable) target to the specific end-user categories. In these terms, the nine case studies analysed represent good practices to be inspired by.

The definition of such conditions is relevant due to their direct influence on the sequence of required steps (e.g., charging or links to external platforms or resources) - as highlighted in the workflow for accessing CC services. In order to increase the level of accessibility, useful support tools are represented by user profiling systems in the search/browse engine or the use of tags that will be associated with the specific services and/or type of resources that are part of the catalogue, capable of making information clearly findable by the various categories according to their job, skills or interests. In addition to this, providing contents in

multiple languages – at least for the general description/presentation of services - represents another way for orienting and encouraging the use and exploiting the resources that make up the services.

The modalities set up to get in touch with the CC and receive information or support on services – as drafted in the workflow for accessing CC services- will be another crucial point. The case studies show how a well-structured FAQs system - for example referring to practical cases, directly listing (or linking) the available and relevant resources - can be an effective solution, as well as a filter for ‘unnecessary’ direct contacts. Another frequently used tool, in addition to the direct provision of e-mail contacts, is the text form, supplemented by contact persons or direct contacts for specific topics/areas.

- **Multiple forms and levels of interaction for services provision: direct and indirect.** Different levels of interaction can be experimented and foreseen to access but also to manage services and related resources. The lessons learnt from the overall analysis on the centres (D2.[1] - *Report on CCs*) and the in-depth study on 9 case studies, highlight several forms of cataloguing, presenting or explaining the services - for instance by topics or type (e.g., dissemination, communication, training, etc.) - as well as the multiple ways through which the same service can be offered, with different levels of interaction (asynchronous provision of documents, reports, videos, webinars, conferences, toolkits and tools, FAQs, etc.; live online sessions or in person activities and events; etc.) and required supporting structures (official webpage, internal or external platforms). These key aspects are also directly linked to the form of relationship that the CC will have with users: whether single/individual users (mainly indirectly, by offering online documentation, resource and training) and/or institutions, research centres or other entities (with direct contacts/interactions). Considerations valid in particular for the two macro-categories of ‘Consultancy and Orientation’, and ‘Training and Capacity Building’.

For ‘Support in Innovation and Projects’, the conditions of collaborative research with other entities/institutions, as well as the networking, find a direct correlation with the legal form, with the organisational structure of the national nodes, and the recruitment procedures of national communities, being defined in the framework of WP2 and WP6 activities.

The feasibility to offer services managed in multiple ways is directly linked to still open issues such as the sources of funding on which the CC will be able to rely and the related operational structures – not only digital, but also staff, thematic departments and working groups, the availability of physical spaces/headquarters, etc.

- **Implementing and bridging existing resources and activities.** Considering the role of guidance that 4CH should play with respect to the wide realm of institutions, organisations, associations and subjects operating in the Cultural Heritage field at different level, in addition to the services directly offered and managed through its internal operational structures (4CH platform, Cloud and Knowledge base), the CC should be able to inform and directly refer to other existing activities, tools, services and initiatives, promoting a more effective coordination, avoiding overlapping or duplication of efforts. According to a

federative logic, the CC could represent the central node of a network of facilities offering complementary services.

Collaborative research ('Support in Innovation and Projects') aimed at the development of new knowledge, data collections and tools, as well as the different forms of promoting networking (fellowships, workshops, conferences, etc.) – as pointed out by the case studies analysis - represents a fundamental instrument to work in synergy on common topics. In particular, some results from the analysis on existing catalogues (e.g., The CLARIN/DARIAH DH Course Registry<sup>18</sup>) can provide useful experiences of promoting the exchange of information and data among different institutions/organisations, managing both internal and external resources.

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<sup>18</sup> <https://dhcr.clarin-dariah.eu/>

## 3 Training services on the field of activities identified (T4.3)

### 3.1 Introduction

#### 3.1.1 Objectives and definitions

This chapter reports the results of Task 4.3 (T4.3) “Training services on the field of activities identified, with a specific focus on the area on which the Competence Centre (CC) will release protocols, guidelines or platform tools”. We report on how the 4CH training system<sup>19</sup> could be defined, and include analysis-based recommendations for both an online training/learning resources catalogue for 4CH stakeholders and for training to be developed within the 4CH network. The task is led by DANS-KNAW, with partners CARARE, UNIBO, PIN, ATHENA, and FORTH.

It is first essential to clarify how we define the concepts that we use in this chapter (see also the ‘Definitions’ section). When we speak of a ‘system’ in 4CH, we are referring to the broad meaning of a method or a way of doing something. ‘Training’ and ‘learning’ are often used interchangeably, but have in fact a different meaning. ‘Learning’ is the activity of obtaining knowledge in general, while training is more specifically the process of learning the skills you need to do a particular job or activity.<sup>20</sup> Consequently, when we speak of learning resources we mean any physical or digital resource that has a particular and explicit orientation towards learning, education, skill acquisition, and other educational purposes.<sup>21</sup> With ‘training resources’ we mean a subgroup of learning resources that are used in a training context, involving instructors, facilitators, and students/trainees.<sup>22</sup> With a **‘training system’**, we mean a method for organising (information about) training and learning materials (e.g. an online platform) and for delivering training. This term is somewhat confusing, since in the CC we will also have resources that do not specifically relate to training, but to learning in order to increase stakeholders’ competence in general.

This chapter consists of the following three parts, reflecting the main objectives:

1. Section 3.2, “Towards the definition of the 4CH training system”, describes the outcomes of analyses to assess:
  - a. Which training user profiles are relevant for the CC (e.g. what are our target groups), based on the user groups as defined in D1.2.

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<sup>19</sup> ‘System defined here broadly as “a way of doing things”,  
<https://dictionary.cambridge.org/dictionary/english/system>; see also the ‘Definitions’ section.

<sup>20</sup> <https://dictionary.cambridge.org/dictionary/english/learning>

<sup>21</sup> Schema.org

<sup>22</sup> EOSC Future glossary



- b. Based on the general 4CH user needs, as defined in D1.2, what are the corresponding training needs and which training themes and topics can address these needs?
    - c. Based on the organisations analysed in D2.1 as well as other relevant use cases, what are the recommendations for the set up, organisation, management, etc., for the 4CH training system?
  2. Section 3.3, “Creating the 4CH training system”, first takes the information on user profiles, training needs and identified training themes as well as the assessment of how other organisations organise their training and forms these into concrete recommendations on how to organise the CC training system. As part of this, it discusses:
    - a. Themes, organisation, and management of the 4CH training system.
    - b. Metadata elements for learning/training resource materials and for training events.
    - c. How to ensure that the 4CH training materials are FAIR (Findable, Accessible, Interoperable, and Reusable).
    - d. How to upload metadata of training materials to the 4CH Knowledge Base.
  3. Section 3.4, “New 4CH training to be developed: the 4CH curriculum framework for training”, describes the 4CH framework to support the development of different types of training (focused on digitisation). User profiles, stages, subjects, and topics are defined and/or further explored, and can be used to identify and direct required learning.

### 3.1.2 Working methodology

The work presented in section 3.2 is a ‘state-of-the-art’ overview based on analysis of external research and reports and builds on the work of WP1 and WP2 (Fig. 3.2). Training profiles and training needs were identified based on the user groups and user needs, which had been identified by WP1 on the basis of a user survey. Subsequently, these were used to identify broad training themes. Based on this analysis, high-level recommendations were made on which topics to cover in the 4CH training system. Concrete examples of existing resources covering these topics were also given (section 3.3). A detailed analysis was also undertaken and, as a result, a curriculum framework for training set up identifying and applying user profiles, stages, subjects, and topics (section 3.4).

At the same time, of the organisations analysed by WP2 (D2.1) the 42 organisations<sup>23</sup> identified by T4.2, as well as three additional organisations, offering training and skills development were selected and their characteristics in terms of learning resources and training activities were systematically analysed. Based on this analysis certain criteria could be identified as important (content, reuse of existing resources), on the basis of which six use cases were studied more closely. Based on these analyses, recommendations were made on the 4CH

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<sup>23</sup> A total of 51 entities were analysed in D2.1, but organisations that do not provide training services were excluded here.

training system, also taking into account the WP3 technical recommendations and a ‘best practices’ analysis based on literature on metadata for learning resources and other FAIR practices.

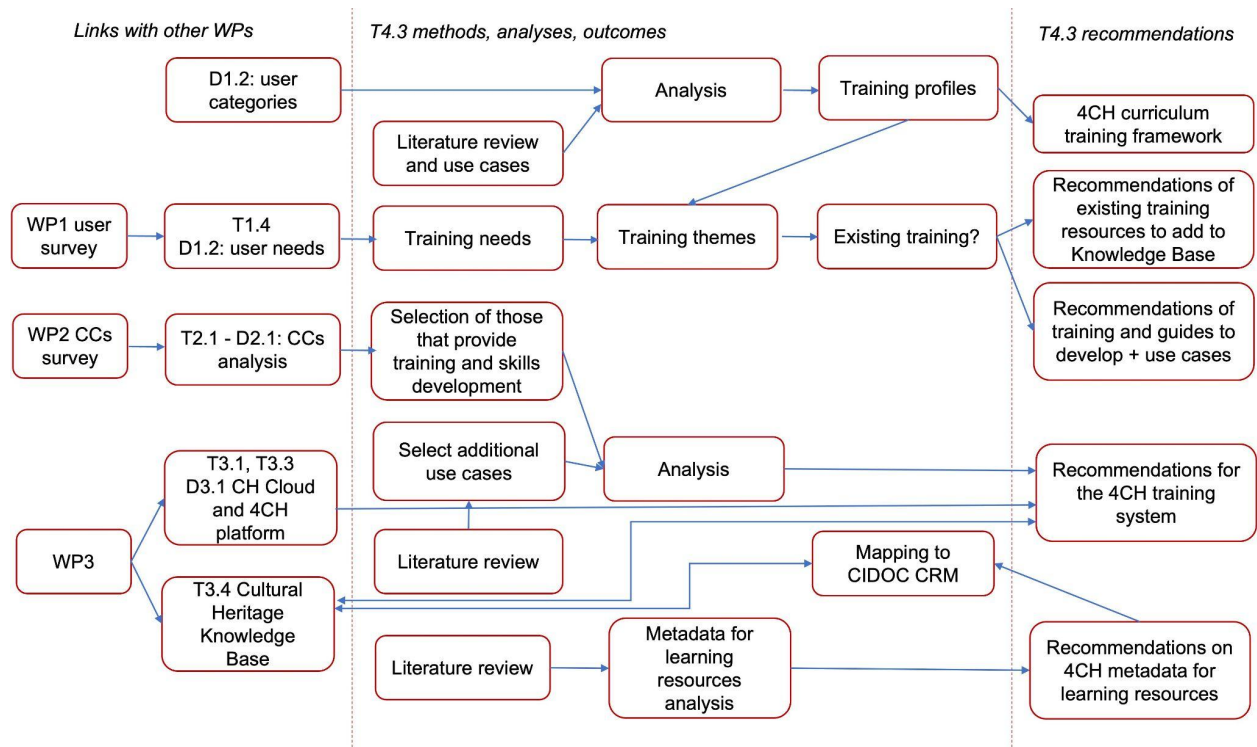


Figure 3.1. Overview of the methods used for T4.3 and how these led to the presented outcomes and recommendations.

## 3.2 Towards the definition of the 4CH training system

### 3.2.1 Introduction

To determine the structure of the 4CH training system and plan its content, organisation, and materials, it is necessary to identify the target audiences of the training and where their training needs lie. It is the aim of the CC to provide content on all areas addressed by the project, so preservation, conservation, and valorisation of cultural heritage,<sup>24</sup> but since this is broad we have assessed what the main, immediate training needs are. In this section we therefore present the results of the analyses on:

1. What are the training profiles, based on the 4CH user categories defined by WP1?
2. What are the training needs, based on the 4CH user needs, pains, and gains as identified through the user survey done by WP1?
3. What is a suitable model for the training system, based on the organisations analysed in the CC survey by WP2 plus a few additional use cases?

A more in-depth curriculum framework for training is explained in section 3.4

### 3.2.2 Profiles of training users

For the 4CH project, WP1, T1.4 identified nine user categories, distilled into four main target user communities, as discussed in section 2.2.3.<sup>25</sup> A mapping of these user communities to the user groups identified by T1.4, organisation categories identified by the European Collaborative Cloud for Cultural Heritage (ECCCH)<sup>26</sup> and those identified by the ARIADNEplus project<sup>27</sup> can be found in T4.3 Appendix 1, *Training profiles*, Table 1, *Organisations*.

In terms of audience for *training*, the ‘DigCurV Curriculum Framework’<sup>28</sup> identifies three “skill lenses”, each with specific domain expertise, technical skills, and motivation for engagement, and therefore different training needs: the executive lens, the manager lens, and the practitioner lens.<sup>29</sup> Using these three lenses and mapping these onto the 4CH user groups as well as user groups identified in other relevant use cases like ARIADNEplus and the ECCCH (presented in T4.3 Appendix 1, *Training profiles*, Table 2, *Training users*), we therefore identify the following broad 4CH training profiles (Fig. 3.2):

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<sup>24</sup> For definitions see Cortis (2022). D1.1 p. 70 and the start of this document.

<sup>25</sup> See also Cortis (2022). D1.1, p. 71; Cortis (2022). D1.2, p. 52; <https://www.4ch-project.eu/4ch-end-users/>, accessed 10 March 2023.

<sup>26</sup> European Commission, Directorate-General for Research and Innovation, Stakeholders’ survey on a European collaborative cloud for cultural heritage : report on the online survey results, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2777/691331>.

<sup>27</sup> Guntram. G. (2021). D2.3 Final Report on Community Needs (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5647356>

<sup>28</sup> Digital Curator Vocational Education Europe (DigCurV) project, <https://digcurv.gla.ac.uk/>

<sup>29</sup> <https://digcurv.gla.ac.uk/>, accessed 10 March 2023. See also Walsh, D., P. Clough, J. Foster (2016). User categories for digital cultural heritage, CEUR Workshop Proceedings, 1611; Cortis (2022), D1.2, p. 47-48.

- **Practitioner.** This profile includes professionals working hands-on with data capture, data analysis, etc., and includes, for example, researchers, curators, documentation specialists, collection specialists, digital specialists, and research supporters.
- **Manager.** This profile includes people responsible for managing teams, such as repository managers, data managers, and section leaders.
- **Policy-maker.** This profile includes executives and decision-makers of public bodies and private organisations.

Each of the profiles has different training needs, and each can be further subdivided by expertise level (beginner/basic, intermediate, advanced). All these training categories have a professional reason for engagement, as within 4CH the focus of capacity building lies on heritage professionals and researchers.

**Practitioners** require skills that enable them to plan and execute a variety of technical tasks, and therefore they need to understand diverse issues relating to their specific area of cultural heritage as well as digital curation in general.<sup>30</sup> They should, for example, be able to select and apply appropriate technical solutions, but also understand relevant data structures and formats and apply domain-specific digital preservation standards.<sup>31</sup> Of the practitioners, professional researchers are the most numerous users of 4CH so far.<sup>32</sup> They have a high level of domain expertise and a high skill level, but may not be versed in certain digital tools or techniques and certain aspects of research data management. Data managers or stewards, or other research supporters, on the other hand, are much more highly skilled at research data management, but because of a lower level of domain knowledge, they may require training in domain-specific standards and best practices. This user profile also includes ‘trainers’, as these data stewards can in turn train researchers/practitioners in their institution.

A **manager** leads a team or project; they require skills to plan and execute projects on the conservation, preservation and valorisation of cultural heritage.<sup>33</sup> Their domain expertise and technical skills may be variable and they might require training on specific technologies so that they can plan a (digitisation) project. For example, they need to be aware of, and to a certain extent understand, techniques, (digital) tools, and relevant standards on a high level and to use this knowledge to undertake business and project planning and to recruit new relevant staff or arrange training for existing staff.<sup>34</sup>

A **policy-maker**, or decision-maker, might head a cultural institution or work for a public body. They require skills that allow them to maintain a strategic view, to identify emerging challenges and to make funding decisions to address these.<sup>35</sup> For example, they need to be

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<sup>30</sup> <https://digcurv.gla.ac.uk/practitionerLens.html>, accessed 10 March 2023.

<sup>31</sup> [https://digcurv.gla.ac.uk/assets/downloads/dcsf\\_practitioner\\_lens.pdf](https://digcurv.gla.ac.uk/assets/downloads/dcsf_practitioner_lens.pdf), accessed 10 March 2023.

<sup>32</sup> In the 4CH User Needs Survey presented in D1.2 professional researcher made up 46% of respondents, while in the ARIADNEplus community survey there were 62% researchers, and in the European Collaborative Cloud for Cultural Heritage Stakeholder Survey there were 33%, in all cases the largest group of respondents.

<sup>33</sup> <https://digcurv.gla.ac.uk/managerLens.html>, accessed 10 March 2023.

<sup>34</sup> See [https://digcurv.gla.ac.uk/assets/downloads/dcsf\\_manager\\_lens.pdf](https://digcurv.gla.ac.uk/assets/downloads/dcsf_manager_lens.pdf), accessed 10 March 2023.

<sup>35</sup> <https://digcurv.gla.ac.uk/executiveLens.html>, accessed 10 March 2023.

aware of the current and emerging subject landscape and to prioritise funding or accordingly.<sup>36</sup> They might require training on new technologies and principles so they can develop policies and/or programmes for their organisation and beyond.

The training profiles are further discussed in section 3.4. User needs are more specifically discussed in the section below, 3.2.3.

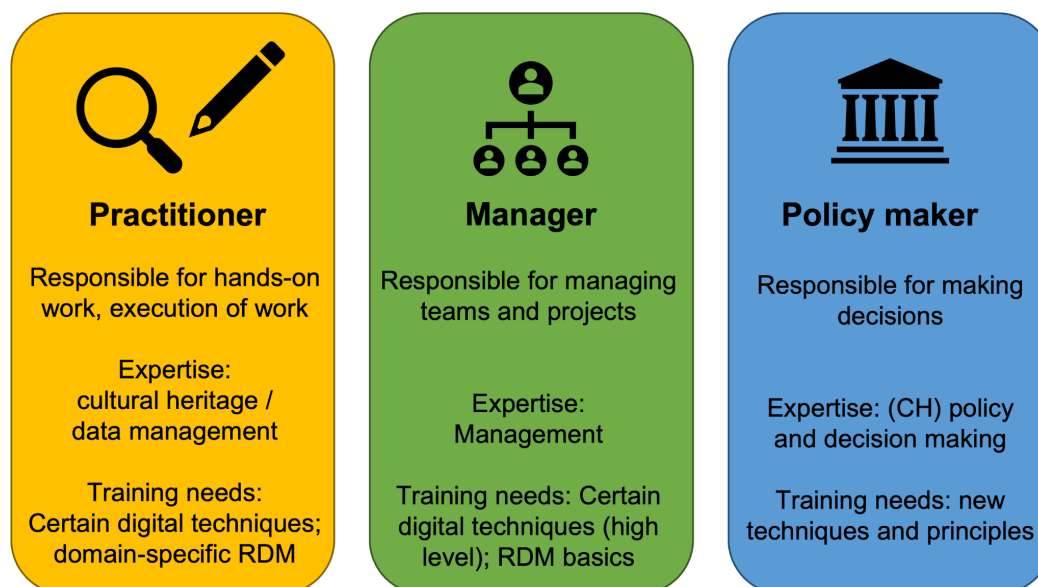


Figure 3.2. The three training profiles and their main characteristics in relation to digital cultural heritage. For more extensive characteristics of these profiles in general see also <https://digcurv.gla.ac.uk/> and section 3.4.

### 3.2.3 Training themes and user needs

The 4CH training content should align with the needs of its users. For this stage of the project, user needs in general were identified in the survey presented in D1.2,<sup>37</sup> and current training needs were distilled from these by T4.3. The user needs which were deemed most important by the respondents of the survey presented in D1.2 are presented in Table 3.1, with the corresponding challenges that could be solved with training or other learning resources (like guidelines), and the corresponding broad training topics. These represent the initial or current training needs. Based on D4.1,<sup>38</sup> we have identified broader training needs and the 4CH will continue to review what sort of training and other capacity building its users need.

<sup>36</sup> [https://digcurv.gla.ac.uk/assets/downloads/dcsf\\_executive\\_lens.pdf](https://digcurv.gla.ac.uk/assets/downloads/dcsf_executive_lens.pdf), accessed 10 March 2023.

<sup>37</sup> Cortis (2022). D1.2; see also the user needs as they were identified based on the experience of senior project members, Bombini et al. (2022). Digitizing Cultural Heritage. There were 48 respondents, 22 professional researchers, 7 “others”, 6 decision-makers and national public bodies, 4 associations / NGOs / local communities / citizens, 3 professionals and SMEs, 3 public and/or private heritage institutions, 2 companies from creative industries, and 1 museum curator, D1.2 p. 59.

<sup>38</sup> Medici, M. & K. Fernie. (2022). D4.1 Report on standards, procedures and protocols (1.0). Zenodo. <https://doi.org/10.5281/zenodo.7701529>

*Table 3.1. The user needs that were indicated by at least 75% of the respondents to rank highly in importance (4-5 on a scale of 5) (D1.2). In bold (blue cells): 90% or more of the respondents ranked this as high importance. Each of the identified user needs has got multiple challenges; only those that can be addressed by training or guidance are specified here, for the others please see D1.2. Broad training topics are indicated and also linked to the user needs as identified in Bombini et al. 2022.<sup>39</sup>*

<i>Highly-ranked user needs (D1.2)</i>	<i>Related challenges (“user pains” D1.2)</i>	<i>Guidance/training topic(s) (defined by T4.3 based on the user needs and pains)</i>
UN-01: Optimised, cost-effective and time-saving procedures for data capturing and processing.	Difficulties in using or adapting to new different software and hardware.	Data capturing and processing software and hardware for artefacts and monuments. E.g. 3D survey of a building, 3D data capturing of artefacts, BIM modelling.
	The lack of enough digital information explaining content.	
	... need of specialised users for data acquisition and reconstruction.	
	Increasing gap between specialist and non-technical users in heritage documentation.	
UN-06: The need for comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards.	More reliable maintenance, quick restoration, and long-term conservation of CH assets.	Risk assessment methods; maintenance, restoration, conservation skills. E.g. 3D monitoring, disaster prevention.
	High professional skills in satellite remote sensing analysis and interpretation are needed.	Satellite remote sensing analysis and interpretation.
UN-08: Common protocols, implementation guidelines and sharing of lessons learned for regeneration and adaptive reuse of historic city centres.	-	Community engagement, dissemination tools
<b>UN-12: Facilitate digital models sharing and information exchange.</b>	Difficulties in using or adapting to new different software and hardware.	Data documentation and sharing software and hardware.
UN-17: Visually organize 3D digital archives by the display of different levels of information.	Data interoperability; Integration and enrichment of semantic attributes.	Semantic artefacts / attributes (controlled vocabularies); metadata.
<b>UN-18: Provision of infrastructure and services for data sharing, access and re-use.</b>	A lack of understanding between those collecting the information and the researchers.	<i>[make training suitable for practitioners who are not researchers]</i>

<sup>39</sup> Bombini et al. (2022), Digitizing Cultural Heritage.

<i>Highly-ranked user needs (D1.2)</i>	<i>Related challenges (“user pains” D1.2)</i>	<i>Guidance/training topic(s) (defined by T4.3 based on the user needs and pains)</i>
	Lack of integration and incomplete access to digital resources.	Metadata; semantic artefacts <sup>40</sup> ; rights and licences.
	Users (often without much background knowledge) are left on their own to browse and search through massive online portals without guidance.	Searching online portals; metadata.
	Lack of knowledge and tools for easy sharing of visual resources and to support remote visual analysis.	Sharing of visual resources; remote visual analysis. Visualisation tools.
<b>UN-19: Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible.</b>	The availability of digitalization tools is limited to experts and highly costly.	Use of (open) digitalization tools.
UN-20: Generating and customising visualisation that allow users to dynamically and creatively experience digital contents.	Interoperability.	Semantic artefacts / attributes (controlled vocabularies); metadata.
UN-21: Long-term preservation framework for large volumes of digital data.	Lack of integration and incomplete access to digital resources.	Data interoperability and distribution: Metadata; semantic artefacts; rights and licences; Data mapping, conversion and transformation.
	Ad hoc approaches to digital preservation.	Data management (all aspects); data storage.
UN-22: Availability of digital archiving standards.	Lack of quality in metadata contents in most of the cases; difficulty in accessing metadata contents due largely to limited user's knowledge on the content of the metadata; heterogeneity of the data at the level of schemas which makes the access even more difficult.	Data delivery and archiving: Metadata
UN-23: Reuse and recontextualization assessment standards.	Lack of standardised assessment approaches, ... training and expertise in interpreting collected data.	Data interpretation; Also related to data connection and reuse.

<sup>40</sup> Semantic artefacts: lists, vocabularies, thesauri, ontologies.

<i>Highly-ranked user needs (D1.2)</i>	<i>Related challenges (“user pains” D1.2)</i>	<i>Guidance/training topic(s) (defined by T4.3 based on the user needs and pains)</i>
UN-25: Benefits and provides opportunities for scientific research but also to enable the ‘public to explore collections for inspiration, learning and enjoyment’ and ‘to research, share and interpret.	No comprehensive understanding of what constitutes 3D image qualities for a digital artefact, from the point of view of a heritage professional.	Data capture and documentation.

Training topics that address the most pressing user needs can therefore be divided into training that teaches practical digital skills for each of the project phases (capturing, processing, storage, access; the policy and planning phases are not represented, which does however not mean they are not related to any training needs) and training aimed at data management skills in general (data interoperability, metadata, use of controlled vocabularies). These training needs are further reflected in the 2022 ‘Stakeholders’ Survey on a European Collaborative Cloud for Cultural Heritage’, which had 1,081 responses, mostly from stakeholders working at a university or research centre (43%) or a cultural heritage institution (32%).<sup>41</sup> One of the main identified challenges was the lack of digital skills among staff (49%), in particular on topics such as digitisation, metadata enrichment, semantic interoperability, content creation, licencing, reuse, relevant business models, and innovation,<sup>42</sup> and training on digital skills was consequently identified as needed by 39% of respondents.<sup>43</sup> Training on how to use the cloud was identified by 55% as needed - this is not directly relevant here, but the same holds for the 4CH: Dedicated training on how to use the provided Knowledge Base and 4CH tools will be important. Training on digital skills and digital research data management (e.g. open data, open licensing) was also something that was identified as a user need in the ARIADNEplus community needs analyses, both from the community and repositories surveys.<sup>44</sup>

Based on the training needs, we can distil the following training (/guidance) topics that are required by the 4CH users (Table 3.2).

<sup>41</sup> European Commission, Directorate-General for Research and Innovation, Stakeholders’ survey on a European collaborative cloud for cultural heritage : report on the online survey results, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2777/691331>.

<sup>42</sup> European Commission (2022), Stakeholders survey, p. 14.

<sup>43</sup> European Commission (2022), Stakeholders survey, p. 19.

<sup>44</sup> Guntram, G. (2021). D2.3 Final Report on Community Needs (1.0). Zenodo.

<https://doi.org/10.5281/zenodo.5647356>; Guntram, G. (2019). D2.1 Initial Report on Community Needs. Zenodo. <https://doi.org/10.5281/zenodo.4916190>; most appreciated were FAIR data principles, managing datasets of a large project, depositing datasets in a digital repository, and data science skills; how to create a DMP, manage a digital repository, produce metadata and use domain vocabularies were less appreciated (2021, p. 24). However, they did require training on depositing, and therefore metadata, and based on the 4CH user needs, training in the latter topics are indeed required.



Table 3.2. Summary / broad topics of user needs as derived from the survey and assessment presented in D1.2. The phases correspond to corresponding chapters in D4.1. Pr = Practitioner; M = Manager.

Project phase	Broad training need	Example training topics	Training profile(s)
Data capturing	Data capturing software / techniques / tools - artefacts	3D capturing of artefacts (general or focused on a specific technique)	Pr
	Data capturing software / techniques / tools - sites and monuments	3D survey of a building, 3D digitisation	Pr
	Monitoring - sites and monuments	3D monitoring; 2D monitoring (satellite remote sensing)	Pr
	Risk assessment - sites and monuments	Risk assessment: climate change, natural hazards, etc.	Pr; M
Data processing	Data processing software / techniques / tools - artefacts	3D objects modelling	Pr
	Data processing software / techniques / tools - sites and monuments	BIM modelling; point cloud modelling	Pr
	Data interpretation	3D monitoring interpretation; virtual reconstruction (interpretation process); satellite remote sensing interpretation	Pr
Data storage	'Hardware': Storage platform / cloud	How to store 3D data? How to use the 4CH cloud?	Pr
Data management	Data formats	3D data formats	Pr
	Metadata	Preservation / CH metadata; metadata for 3D models	Pr
	Controlled vocabularies, thesauri, ontologies	Controlled vocabularies for cultural heritage; Getty's AAT; CIDOC CRM	Pr
	Linked data	Linking cultural heritage data	Pr
	Quality: data consistency		Pr
Access	Sharing software and tools	Visualisation tools, 3D viewers, virtual objects, virtual worlds	Pr
	Sharing and access infrastructure	3D platforms	Pr
	Sharing protocols	Best practices in sharing 3D data	Pr
	Sharing, reuse and aggregation: repositories	Long-term preservation of 3D data: 3D digital archives; Archiving intangible heritage data	Pr
	Access rights and licences	Rights & licences for heritage data	Pr, M
	Dissemination tools (general public)	Community engagement; storytelling; 3D printing	Pr

This preliminary framework gives us a concrete idea where current training needs lie and how these can be addressed by training (please note that the training examples listed are not an

exhaustive list of all possible training). This is a useful starting point. We also, however, already identify some gaps that likely will need to be addressed through training.

Firstly, the identified training is almost exclusively focused on practitioners, possibly reflecting the large input of this group into the survey, but training for managers and policy makers is also required. In addition, and related to this, if we look at the project stages in D4.1, we see that the ‘planning’ stage is not addressed in our training needs table. This can be started to be addressed by higher level training in, for example, new 3D data capturing and processing techniques and a big picture information ‘training’ on developments in cultural heritage and how the 4CH contributes to the sector. This is taken further in section 3.4.

Secondly, the 4CH covers three main areas: preservation, conservation, and valorisation, and is to a large extent focused on digitisation and 3D survey and modelling. Conservation and preservation include topics like in-situ sensing, material characterization, compositional characterization, and surface topography. Valorisation includes topics like enhancement technologies (computer graphics, virtual reality, augmented reality), 3D online repositories and visualisations, and additive manufacturing like 3D printing.<sup>45</sup> The content of 4CH training should therefore include all of these fields. While the identified most urgent training needs are a clear starting point covering some of these topics, it is nonetheless likely that other topics also require training, but perhaps by users not interviewed or by a smaller group of the interviewed users,<sup>46</sup> or that such a training need will develop in future. The 4CH will continue to review training needs and the development of required training through a curriculum framework for training is further discussed in section 3.4.

### **3.2.4 Existing training systems: examples and use cases**

#### **3.2.4.1 Introduction**

In order to assess a suitable type of training system for the CC, we have undertaken a literature review of existing ways of presenting, making available, managing, and organising learning resources and training events, such as training catalogues, learning platform instances, and ‘simple’ web pages. Here, we define a training catalogue as an online catalogue of training resources consisting of (a database with) metadata of training resources and in this case an online interface so that we could find the information (see also the ‘Definitions’ section at the beginning of the Deliverable). A learning platform is also an online interface, but containing not just metadata but actual tools and resources to support learning.

Firstly, we systematically assessed the ways in which the organisations already included in D2.1 have made available their training and other learning resources, adding three more use cases that are particularly relevant in terms of training catalogues. Subsequently, we did a more in-depth analysis of six use cases which were most relevant based on their content type, the online sharing of both their own training materials as well as sharing information about other

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<sup>45</sup> Cortis (2022). D1.1, p. 71-86, especially table 2.4 on p. 72.

<sup>46</sup> The training needs were based on the highest ranked user needs, but the lower ranked user needs might still be of importance to some users.

relevant training, and (hereto) the use of (rich) metadata. Details are presented in T4.3 Appendix 2 *Training landscape* and T4.3 Appendix 3 *Training system use cases*.

### 3.2.4.2 Overview based on other CCs and relevant organisations

D2.1 summarised the characteristics of existing (D)CCs, Research Infrastructures, Documentation Centres, and other relevant organisations. For the current task 4.3, we selected the 42 of these that are offering capacity building, or at least that were clearly identifiable as such. As part of T4.3, this aspect was closer looked at in a systematic way (T4.3 Appendix 2 *Training landscape*). This subsection briefly summarises what can be learnt from this.

Most of the 42 organisations (81%) do not aggregate training materials from other sources. Although they frequently provide a ‘knowledge base’ section with documents on their website, these do not often contain specific learning or training resources, i.e. resources explicitly meant for learning rather than for dissemination in general.<sup>47</sup> Six of the 42 organisations do aggregate training materials, four of these are research infrastructures and two are documentation centres on cultural heritage. Beyond these, there are more relevant organisations or projects that aggregate training materials, like ARIADNEplus,<sup>48</sup> the Social Sciences and Humanities Open Cloud (SSHOC)<sup>49</sup> and ELIXIR-TeSS.<sup>50</sup> Since it is a clear aim of the 4CH to reuse as much material as possible, pointing to (metadata of) existing external training and training materials would be very useful; following therefore not the majority of analysed organisations, but rather relevant examples like CARARE, ARIADNEplus, and SSHOC. As in these examples, this could be metadata of training materials from trusted project partners, but could also include external materials specifically selected for the usefulness and quality, as is also done by CARARE and ARIADNEplus.

Since the 42 organisations out of the total presented in D2.1 were selected on the basis that they offer some form of capacity building (see above), it is not surprising that **83% of them develop their own training or learning resources**. This is done in various ways (Figure 3.3). Most of the recorded learning resource types are of an online type (66%), which is not surprising since our search was done online. Nonetheless it likely also reflects the increase in online learning since the COVID-19 pandemic and the general trend towards making materials available in a digital format. The majority of resource type instances are of a synchronous<sup>51</sup> nature (69%), like webinars, training workshops, and courses, although recordings of webinars are often also made available online as a static resource. With an audience spread over Europe, we recommend that the 4CH (partly) follows the online example, but filling the gap of providing

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<sup>47</sup> See the ‘Definitions’ section at the start of this Deliverable.

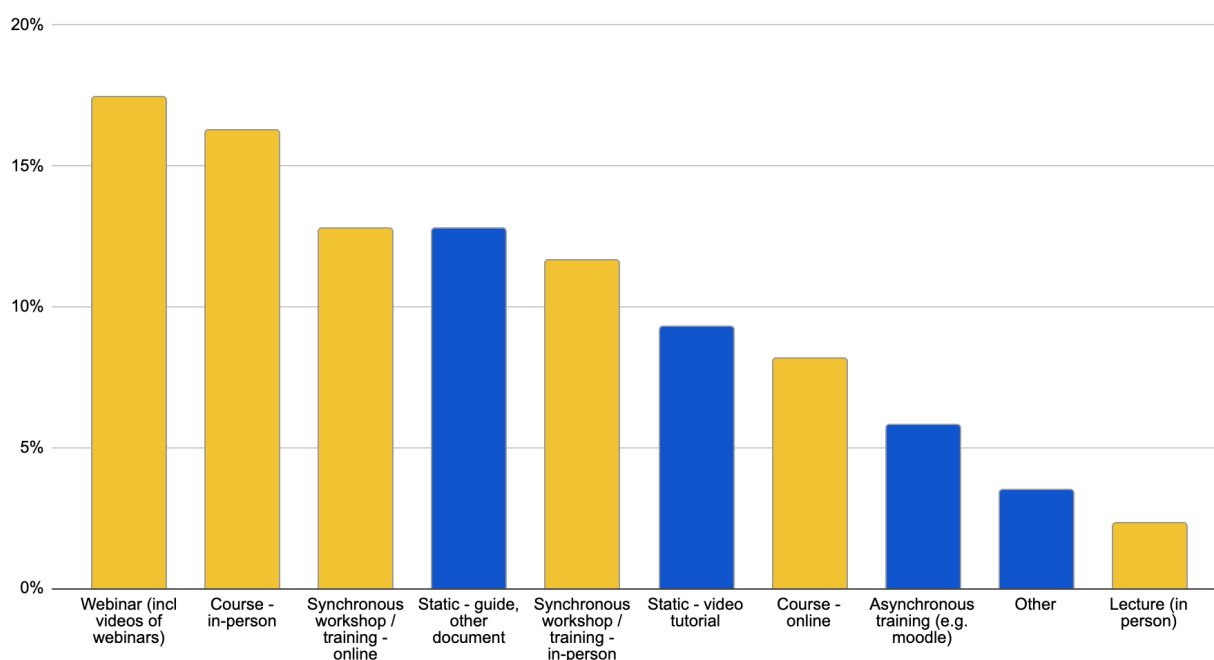
<sup>48</sup> <https://ariadne-infrastructure.eu/>

<sup>49</sup> <https://sshopencloud.eu/>

<sup>50</sup> <https://tess.elixir-europe.org/>

<sup>51</sup> Synchronous: occurring in real time, at the same time as the other learners and the instructor(s); in contrast to asynchronous or self-paced, where the learner follows the training at their own pace.

asynchronous materials where needed.<sup>52</sup> Self-paced courses<sup>53</sup> are not common with the 42 studied organisations, while these have the advantage that they can be done at a trainee’s own pace and without requiring a (real-time-present) instructor. We also recommend that the 4CH training resources go beyond just ‘sending’ / ‘acquisition’ materials like (videos of) webinars, but also include activities. Even in self-paced courses these can be included, for example quizzes and other exercises, which make for much more effective learning than just reading text and watching videos (especially if these are recordings of past events rather than recorded for the purpose of training).<sup>54</sup>



*Figure 3.3. Learning resource types of the 42 analysed organisations (one organisation can offer multiple types of learning resources). Blue/dark: asynchronous, yellow/light: synchronous (but note that webinars are often also made available as static recordings).*

As for practical ways of sharing (links to / metadata of) learning materials, most of the organisations surveyed for D2.1 simply put the information directly on a webpage and do not use a specific learning platform (for self-produced training materials) or hub with standardised

<sup>52</sup> This depends also on the business model, which is currently being defined in other work packages (see also section 3.3).

<sup>53</sup> Asynchronous courses (see the note above), like an online moodle or MOOC course.

<sup>54</sup> Laurillard, D. (2012). *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology*. New York and London: Routledge; Young, C. & N. Perović. (2016). *Rapid and Creative Course Design: As Easy as ABC?* in *Procedia – Social and Behavioral Sciences*, 2nd International Conference on Higher Education Advances, HEAd’16, 21-23 June 2016, València, Spain (Eds) J. Domenech, M. Vincent-Vela, R. Peña-Ortiz, E. de la Poza, D. Blazquez. Available from: <https://doi.org/10.1016/j.sbspro.2016.07.058>; see also <https://abc-ld.org/>

metadata (explored further in section 3.2.4.3). In a couple of cases existing learning platforms like EU Learn<sup>55</sup> are used. While learning platforms allow for specific, targeted training courses and, for example, making course components available through learning paths, they require maintenance, management, and come at a cost. Many of the organisations use existing, free sharing platforms, like YouTube or Vimeo for videos, Slideshare or Zenodo for slides, and Zenodo for guides and other documents.

Access to metadata or the actual resources is completely open for at least part of the resources in 36% of the studied organisations, while registration is required by 33%.<sup>56</sup> This typically concerns online materials and webinars, but also synchronous training. 19% of the organisations have restrictions on accessing the training, which can for example be a test or having to belong to a certain, specified audience. 19% of the organisations offer paid training, typically summer schools or complete degrees with a qualification. For some organisations, especially of the national competence centre type, paid training is part of the business model, necessary to cover training costs. For example, DANS co-organises the RDNL Essentials 4 Data Support course, which can be done as a self-paced course for free online, but for in-person course days, supervision of exercises, and a final qualification, all requiring considerable input by the trainers, a fee is required.<sup>57</sup> The recommendation for the 4CH would be to **make metadata always available** so that the correct training (resources) can be found; if fees are required for some of the training depends on the business models of the 4CH and training-providing partner organisations (see section 3.3). Our recommendation is that this should only be done for part of the offered training and learning resources, or like in the example above, for the training-intensive part of a course.

For several of the organisations, the reuse licence is unclear.<sup>58</sup> Because copyright has to be assumed here, these materials cannot be reused. For the Research Infrastructures the licence is generally CC BY<sup>59</sup>, while for the documentation centres on cultural heritage it is more often not specified or otherwise open licences like CC BY or semi-open licences like CC BY-SA are used. The recommendation for the 4CH is to make sure all training materials are clearly licensed, and ideally with an open licence (CC0 or CC BY) so that they can be reused by others (see further WP5- *4CH data management recommendations and guidelines* outputs).

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<sup>55</sup> [elearn.europa.eu](https://elearn.europa.eu/), requiring registration.

<sup>56</sup> Note that one organisation might offer multiple types of access. For 12% of the organisations it was not clear what type of access they provide.

<sup>57</sup> <https://datasupport.researchdata.nl/en/>

<sup>58</sup> For many of the organisations studied it is not applicable, since they are not offering materials online, see above.

<sup>59</sup> See: <https://creativecommons.org/about/ccllicenses/>

### 3.2.4.3 Training system use cases

We have drawn on the use cases in chapter 2 (T4.1 appendix 1), but chose six partly different use cases that are specifically relevant for information of what the 4CH training system could be like. This includes use cases that are not directly related in terms of content, but are relevant because of their training component and how this is set up. The criteria we used was that the use cases firstly represented a range of ‘complexity’ and type so that large EU projects or research infrastructures are included that aggregate training resources from elsewhere as well as delivering their own training, but also organisations more specifically focused on selected cultural heritage content. It was also a requirement that information was shared online. The use cases are: ELIXIR’s TeSS,<sup>60</sup> the Social Sciences and Humanities Open Cloud (SSHOC) Training,<sup>61</sup> CESSDA Training,<sup>62</sup> and the ARIADNE Training Hub<sup>63</sup> as examples of EU-wide consortia, the latter with content relevant to 4CH, and CARARE<sup>64</sup> and the UK Archaeology Data Service<sup>65</sup> as examples of smaller organisations which are offering a substantial training component and are content-wise relevant to 4CH too.

For each of the use cases, we gathered information on how their ‘training system’ is set up: Is there a catalogue or registry with learning resources and if so are the organisation’s ‘own’ training materials catalogued and/or are they aggregating resources from other providers? Is metadata used and if so is this standardised (i.e. is the catalogue well searchable and is the material FAIR(ish))? Are training events (e.g. face-to-face or online workshops) organised, how is this done and how is the information disseminated? The full results as well as a summary of key outcomes are presented in T4.3 Appendix 3 *Training system use cases*.

Based on the use cases, we make the following recommendations for the 4CH:

- To have two components in the 4CH training system: a **combination of a catalogue or registry for training/learning resources and training events**.
- The learning resources catalogue could be part of the 4CH Knowledge Base and point to existing, external materials (through metadata), as well as internal, newly produced 4CH materials.
- It is recommended that the learning resources catalogue is searchable (for humans and machines). An alternative solution would be to divide the web page (i.e. front end of the

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<sup>60</sup> Beard, N. F. Bacall, A. Nenadic, M. Thurston, C. A. Goble, S.-A. Sansone, T. K. Attwood. (2020). TeSS: a platform for discovering life-science training opportunities, *Bioinformatics* 36(10), 3290-3291, <https://doi.org/10.1093/bioinformatics/btaa047>.

<sup>61</sup> <https://sshopencloud.eu/training>, specifically the Training Discovery Toolkit, the Open Marketplace, and training events.

<sup>62</sup> <https://www.cessda.eu/Training>

<sup>63</sup> <https://training.ariadne-infrastructure.eu/>

<sup>64</sup> <https://www.carare.eu/en/>, both the Training Hub and training events.

<sup>65</sup> <https://archaeologydataservice.ac.uk/help-guidance/>; this use case turned out to be less relevant, and is therefore mentioned less in the text than the other five use cases.

catalogue) into main topics and assign a selection of the most relevant and good-quality learning resources to each of these.

- For both static resources and training events, rich, structured, machine-readable **metadata** are of high importance. In this, it is also important to use standard, existing controlled vocabularies when possible so that interoperability with other training databases is possible. This not only makes it easier to put in resources from elsewhere into the 4CH KB, but would also allow harvesting by aggregators like SSHOC, so that the 4CH training would become even better discoverable.
- As part of the metadata, the target audience and the required skill level should be clearly indicated (this is further discussed in section 3.3.3).
- As part of the metadata, **access conditions** and for materials also the **licence** need to be indicated (further discussed in section 3.3.3 and 3.3.4). Ideally, this should be an open licence so that materials can be reused (for example a CC BY licence where the creators are acknowledged, or a CC0 licence). This could be especially important if the 4CH were to act as a European-wide centre for local nodes/partners, who could then reuse each the 4CH and each others' materials.
- **Training events**, for example to be organised by 4CH partners / NCCs (see section 3.3 for a discussion on the potential 4CH business model for training), could consist of face-to-face workshops or online workshops. Webinars might be useful for general capacity building too. The training events can be listed on the 4CH events page. We recommended doing this with rich, structured metadata to improve discoverability for the potential trainees.
- **Materials produced during 4CH-related training events** should be, when relevant, made available as static materials. Depending on the final technical architecture of the 4CH Knowledge Base, they could be hosted there; for the moment at least, they should be put on external platforms like Zenodo (which allows for metadata and assigns a DOI), with only the metadata in the 4CH Knowledge Base (see section 3.3.5).
- Variable training modes should be used, as fitting the target audience and objectives. This should at least include not just 'sending' types (e.g. lectures) but also interactive parts (activities, quizzes, games).
- What would also be useful to 4CH users would be to know who to contact to deliver training. Which organisations, or experts, are specialised in which topic? In the SSHOC project, for example, a **trainers' directory** was set up.<sup>66</sup>

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<sup>66</sup> <https://sshopencloud.eu/trainers-directory>

### 3.3 Creating the 4CH training system

#### 3.3.1 Introduction

We envision that the 4CH training system will have three facets: a registry of training resources (and learning resources in general), training delivery (training events), and a registry of trusted training providers / trainers. In section 3.2 we summarised the training user profiles, identified training needs and related content, and assessed relevant use cases on their training system, making general recommendations based on these. In this section we build on this to make more practical recommendations on the creation of the 4CH training system. We start with the training content (this section), followed by recommendations on the structure and organisation of the training system (section 3.3.2). In order to make learning resources FAIR<sup>67</sup>, several requirements have to be met, with respect to e.g. data formats, usage licences and the application of persistent identifiers. These requirements and other aspects are included in the metadata of the learning resources and training events (section 3.3.3). Ways to ensure the 4CH learning resources are FAIR are presented in section 3.3.4. How to upload training materials is covered by section 3.3.5, and examples of training relevant to 4CH are highlighted in section 3.3.6.

In section 3.2 we established the 4CH training profiles (practitioner, manager, policy maker) and identified the current training needs based on the 4CH user survey. We also discussed that these needs are likely to only be part of the total training needs the 4CH community will encounter. The content themes relate to conservation, preservation, and, currently to a lesser extent, valorisation of cultural heritage during each of a project's phases. They concern 'practical' training in certain relevant data capturing, analysis, and sharing techniques and methods, as well as training on research data management aspects (for details, see section 3.2.3). Section 3.4 will further discuss a framework for training to be newly developed.

Many relevant training events and training resources about the identified topics already exist. In the 4CH project we do not want to reinvent the wheel, but rather reuse suitable existing learning materials where possible. Materials could be linked to in a training catalogue present in the 4CH Knowledge Base, to be used directly by trainees or by trainers to adapt for their training events. Existing training events and training providers could also be highlighted by the 4CH through a dedicated page on the website. In this way, the CC provides the training services in regards to materials, training events, but also the service of recommending where users can find further training. T4.3 made a start with identifying relevant training providers as well as topics covered by them (T4.3 Appendix 4 *Initial review of digital heritage training*), and started to compile a specific list of available training resources of which the metadata could be put into the 4CH Knowledge Base (T4.3 Appendix 5 *Examples of existing learning resources to be integrated in the 4CH Knowledge Base*).

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<sup>67</sup> Wilkinson, M., M. Dumontier, I. Aalbersberg, et al. (2016) The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018. <https://doi.org/10.1038/sdata.2016.18>



### 3.3.2 Organisation / structure of the training system

In section 3.2, we made recommendations for the 4CH training system based on ‘lessons learnt’ from a range of use cases. In this section we go into more depth on how these can be applied to the organisational and structural aspects of the 4CH training system. Since a range of aspects of the CC is still being worked on, also by other WPs, the following principles are at the moment recommendations that we hope can guide the development of the organisation and structure of the 4CH training system.

- The training system will be a virtual competence centre where people can find training events, like face-to-face and online workshops and courses, who can deliver them (an expertise pool), and training materials (plus other learning resources).
- The training system is focused on the 4CH user groups divided over three training profiles: Practitioner, manager, and policy maker.
- The (ideal) 4CH training system consists of a training (metadata) catalogue or registry, as part of the 4CH Knowledge Base, listed training events, and a trainer directory (the latter like in the SSHOC use case).
- In the training/learning resources/materials catalogue/registry, metadata of existing, recommended relevant training materials will be taken up, which can be reused by trainers as well as trainees. Rich, standardised metadata will be used as further outlined in section 3.3.3. Within the catalogue, training/learning materials can be organised either as a searchable and filterable catalogue (like in the CESSDA, TeSS, and SSHOC use cases), which would be the preferred option, or manually divided into different content categories with manual links (still including rich metadata) to the materials (like in the ARIADNEplus, CARARE, and ADS use cases). This for example allows users to find the correct training for them, e.g. training specifically for practitioners, managers, or policy makers.
- Access to 4CH learning resources should be free and open; access to partner or external learning resources depends on the partner/external source, but free and open resources are preferred.
- Training events, like online and face-to-face workshops, are to be organised by 4CH partners. They can reuse materials made available through the CC, and/or develop new materials themselves. The events will be announced through an events section in the 4CH web page, which ideally will contain rich metadata so that it will be easily searchable and (potential) users are optimally informed. These metadata are further detailed in section 3.3.3.
- Training events can be in English or in the local language, but the 4CH will be in English.
- Training events should not just focus on ‘sending’ (i.e. not just lectures and presentations) but also on interactive parts like exercises and games.
- Access to training events depends on funding and the organising partner/affiliated organisation. If the 4CH receives further European funding, this could for example be used for partner organisations to organise free training events or to develop freely accessible training materials or online courses. But if funding is scarce, partners may want to ask for a trainee contribution, especially if considerable input from instructors is required.

- Sustainability: Metadata of learning objects has to be managed and maintained. This means adding new learning objects, removing learning objects that are obsolete or adjusting the metadata of learning objects, e.g. an update of the usage licence in case material becomes available in the public domain or an update of the link/reference to the learning objects. The management of the metadata in a training catalogue seems an appropriate activity of the future 4CH, e.g. by an editorial board. A thematic department for 'Training and education' is planned,<sup>68</sup> which could oversee this maintenance of the learning resources metadata, the trainers registry, and the training events metadata. The learning objects themselves can be hosted and made available both inside and outside the CC. A link to the learning objects must be part of the metadata schema and training catalogue.
- The 4CH could focus on a business-to-business model, where frameworks that can be accessed by trainers would be highlighted, or on a more direct business-to-consumers model. Based on the use cases the and 4CH aim, the former may be more suitable, where the EU-wide CC provides all the information that can be used by (national) partners to set up training. This does not prevent (non-trainer) users to also directly access the materials in the 4CH Knowledge Base.
  - NB: WP6 is working on defining the 4CH business model. To formalise the business aspect of the 4CH training system, the Business model canvas may be a useful template.<sup>69</sup> This strategic management template for developing new business model can be used for providing input on essential components of a training service. It has been successfully used by the EUDAT Collaborative Data Infrastructure (EUDAT CDI).<sup>70</sup>

<sup>71</sup> Applying the Business model canvas on the 4CH training system will help to assess its commercial aspects. It will make clear how the costs for provisioning training can be covered. It is advised to do this exercise once the structure of the 4CH becomes more clear and the integration of the training system in the overall 4CH is more robust.
- Whether learners work towards a qualification depends on the design of the 4CH and its affiliated organisations. One can imagine the 4CH being inclusive and listing free-standing training events, but also accredited courses. One option may be to form learning paths: 4CH would select a series of relevant training modules/courses that if successfully completed may lead to a badge. One could think of different learning paths for different user profiles and with different aims, and the modules could be offered asynchronously online (e.g. moodle) or (partly) synchronously online or face-to-face, possibly by accredited organisations. The former would cost more effort to set up, the latter more continuous effort of delivery, marking, etc.

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<sup>68</sup> Project Proposal

<sup>69</sup> Background on the Business model canvas can be found in: Osterwalder, A., & Y. Pigneur. (2009). Business model generation: A handbook for visionaries, game changers, and challengers, OSF; <https://www.strategyzer.com/canvas/business-model-canvas>.

<sup>70</sup> Grootveld et al. (2018). D3.5 Business Plan for Training Activities.

<https://doi.org/10.23728/b2share.db6f10c422534393adcec655919970a4>

<sup>71</sup> EUDAT is an infrastructure of integrated data services and resources supporting research in Europe. <https://www.eudat.eu/>

Asynchronous examples are LinkedIn Learning,<sup>72</sup> MOOCs,<sup>73</sup> and the learning pathways on the EOSC Knowledge Hub.<sup>74</sup> These are just some options, and the topic needs to be part of future discussions.

### 3.3.3 Metadata of learning resource materials

To ensure that the 4CH learning resources will be Findable, Accessible, Interoperable, and Reusable, sufficiently rich metadata are important. It is further important that these are standardised and based on existing metadata schemes, not creating “Yet Another Metadata Standard”, since that would make the metadata less interoperable. The “RDA Minimal Metadata for Learning Resources” is a recently produced, community-endorsed minimal metadata set produced by experts, based on previous work by the training community and a thorough analysis of previous learning resource-related metadata schemes.<sup>75</sup> We therefore used this metadata schema. In addition, we have compared the RDA Minimal Metadata for Learning Resources to the SSHOC learning resources metadata,<sup>76</sup> and the EOSC Training Catalogue metadata<sup>77</sup> (T4.3 Appendix 6a *Metadata for learning resources, part A Comparison*). The latter two are based on the RDA Minimal Metadata for Learning Resources, but with added fields based on the needs of their user communities and platform. Some of these, like ‘organisation’ and ‘(sub)discipline’ are also relevant to the 4CH community. The (recommended) 4CH metadata for learning resources is presented in table 3.3. The metadata have been mapped onto the CIDOC CRM ontology (T4.3 Appendix 6b *Metadata for learning resources, part B mapping*); the mapping onto schema.org was already done by the SSHOC project).<sup>78</sup> Controlled vocabularies have as much as possible been based on existing vocabularies, thesauri, and authoritative lists and are further specified in T4.3 Appendix 6c *Metadata for learning resources, part C Vocabularies*.

Table 3.3. 4CH metadata model for learning resources (public/user facing part). For related controlled vocabularies see appendix 3.7. Definitions from EOSC.<sup>79</sup> n/a = not applicable.

Attribute name	Definition	Type
<b>Descriptive information</b>		
ID	A persistent identifier	ResourceID

<sup>72</sup> <https://www.linkedin.com/learning/>, paid-for service.

<sup>73</sup> “Massive Open Online Courses”, free online courses available to anyone to enrol (payment may be required for extra functionality like marking of exercises). See <https://www.mooc.org/>

<sup>74</sup> <https://wiki.eoscfuture.eu/display/PUBLIC/Learning+Paths>; see also <https://training.ni4os.eu/course/index.php?categoryid=7>

<sup>75</sup> Hoebelheinrich et al. (2022). Recommendations for a minimal metadata set to aid harmonised discovery of learning resources (1.0). <https://doi.org/10.15497/RDA00073>

<sup>76</sup> Braukmann et al. (2022). D6.11 SSHOC Trainer Toolkit (final) (v1.0). Zenodo. <https://doi.org/10.5281/zenodo.6564283>

<sup>77</sup> <https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile++Data+Model>

<sup>78</sup> Braukmann et al. (2022). D6.11 SSHOC Trainer Toolkit

<sup>79</sup> <https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile++Data+Model>

<i>Attribute name</i>	<i>Definition</i>	<i>Type</i>
Title	The human readable name of the learning resource.	String
Abstract / description	A brief synopsis about or description of the learning resources.	String
Author(s)	The name(s) of the entity(ies) authoring the resource.	String
Author ORCID(s)	The ORCID identifier(s) of the entity(ies) authoring the resource.	ORCID ID
Organisation	The name of the organisation that manages or delivers the resource.	String
(Primary) Language	The language in which the resource was published or made available (one language per entry)	Controlled vocabulary
Version date	The version date for the most recently published resource.	Date
Created date	The date the resource was originally created.	Date
<b>Descriptive information (content)</b>		
Keywords	The keyword(s) or tag(s) used to describe the resource.	String / controlled vocabulary
Scientific (sub)domain	The sub-branch of cultural heritage that is related to the resource.	Controlled vocabulary
<b>Access information</b>		
Licence	A licence that applied to this content (e.g. CC0).	Controlled vocabulary / string
Access Rights	The access status of a resource (open, restricted, paid).	Controlled vocabulary
URL to Resource	The URL that resolves to the learning resource.	String
Resource URL Type	The designation of the identifier scheme used for the resource URL.	Controlled vocabulary
<b>Educational information</b>		
Target group (Audience)	The principal users for which the learning resource was designed.	Controlled vocabulary
Learning Resource Type	The predominant type or kind that characterizes the learning resource.	Controlled vocabulary
Content Resource Type	The predominant content type of the learning resource (video, game, diagram, slides, etc.)	Controlled vocabulary
Learning Outcomes	The descriptions of what knowledge, skills or abilities students should acquire on completion of the resource.	String
Expertise Level	Target skill level in the topic being taught.	Controlled vocabulary
Qualification	Identification of certification, accreditation or badge obtained with course or learning resource.	Controlled vocabulary
Duration	In minutes	Numeric

For events, the metadata is partly the same general information (title, description, authors), content information (keywords/topic, (sub)domain), educational information (learning outcomes, target groups, duration), and access conditions (e.g. costs). There are also event specific metadata that should be included, like the date(s) and location of the event, prior required knowledge. The TeSS event metadata fields, based on the Bioschema profiles CourseInstance<sup>80</sup> and Course<sup>81</sup>, are for example: Title; Description; Organizer; Content Providers; Nodes; Event type; URL to event; Start date; End date; Timezone; Target audience; Eligibility; Credit/Recognition; Cost basis; Sponsors; Keyword; Scientific topic; Operation; Tool; Venue; City; Country.<sup>82</sup>

### 3.3.4 FAIRifying 4CH training

Now the main features of the 4CH training system are defined (such as the training topics, the target groups, the metadata of training objects) it is useful to look into ways to make training material easier to find, to (re)use, and adapt, for the benefit of all. Ten simple rules are defined to make training material FAIR as is illustrated in Figure 3.4.<sup>83</sup>

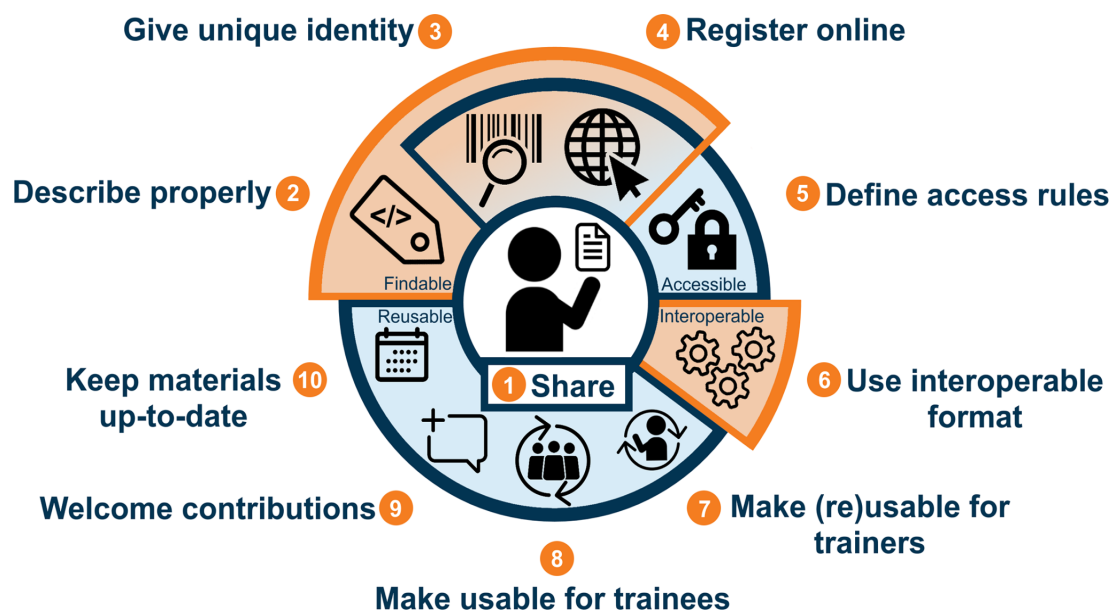


Figure 3.4. Ten simple rules to making training material FAIR (source: Garcia et al. 2020, CC BY licence; Wiegiers & van Gelder 2019).<sup>84</sup>

<sup>80</sup> <https://bioschemas.org/profiles/CourseInstance/1.0-RELEASE>

<sup>81</sup> <https://bioschemas.org/profiles/Course/1.0-RELEASE>

<sup>82</sup> <https://tess.elixir-europe.org/events>; [https://github.com/ElixirTeSS/bioschemas\\_sources#readme](https://github.com/ElixirTeSS/bioschemas_sources#readme)

<sup>83</sup> Garcia et al. (2020) Ten simple rules for making training materials FAIR. PLoS Comput Biol 16(5): e1007854. <https://doi.org/10.1371/journal.pcbi.1007854>.

<sup>84</sup> Wiegiers, L., & C. W. G. van Gelder (2019). Illustration for "Ten simple rules for making training materials FAIR" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.3593258>.

Several “FAIR enabling” aspects, covered by the rules, are addressed by applying rich, standardised metadata. Metadata describe the training materials (and events) properly, make clear what the access rules are, and make the material usable for trainers and trainees. How this can be applied to the 4CH training system has been discussed in section 3.3.3. Other prominent issues, included in the ‘ten rules’, are:

- In order to optimally share training material, a suitable repository should be used. Whereas the metadata of training material will be managed by 4CH, the training material (i.e. the files) itself will not be managed by 4CH, at least not at this stage. For this a repository is required. The [re3data.org](https://re3data.org) portal can be used to find a suitable repository, or an institutional repository can be used. For training materials, Zenodo is useful, and collections of materials can be organised there in a Zenodo community. What is important is that a persistent identifier is applied to the training material.
- In order to make the materials findable, it is essential to add persistent identifiers (PIDs) to the training objects. Common PIDs are DOI, ARK and Handle (DOI is most relevant). For 4CH training material to get such a DOI, it is probably necessary for it to be deposited on a platform like Zenodo, or in a repository that assigns PIDs. Other PIDs that can be applied within the metadata are: ORCID for researchers, ROR for organisations, PID Inst for instruments.
- While it is important to share materials somehow in a way they get assigned a PID (e.g. through Zenodo), this does not make materials very discoverable. In order to increase findability, the materials (i.e. their metadata) should be taken up in a discipline-specific registry. This is exactly the role of the 4CH training catalogue: Here training materials relevant to the CC can be registered so that they become findable to the 4CH community.
- The format for training material should enable interoperability as much as possible. For training materials this has somewhat different implications than for data interoperability: While open standards are important, there is a balance to be made between the format being open (e.g. a PDF/A), editable (if the materials are meant for reuse), known by the community and (therefore) easy to use (e.g. powerpoint), and accessible. It is also an advantage if the format can be version controlled.
  - This can be clarified through an example for slides: Powerpoint is not open and not version controlled, but widely used and works on various operating systems. Google Presentations is very useful for working on something at the same time, but its availability depends on geographic location.<sup>85</sup> A PDF/A is open and easily accessible, but is not editable, which is important for training materials that are to be reused. Less well-known but open options for slides are Open Office Impress or Liber.
- The access rules should be defined in the metadata. To make materials reusable, an open licence is important. While open access data can be used and cited without reproducing it, this is much harder for training materials. For sure, trainees could be trained without the materials being reproduced, but for the CC to be a true hub of information for national partners, ideally training materials can be reused by trainers.

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<sup>85</sup> Garcia et al. (2020). Ten simple rules for making training materials FAIR.

How to create FAIR learning resources, and how to FAIRify existing resources, is further discussed in the article by Garcia et al.,<sup>86</sup> as well as in the FAIR training handbook,<sup>87</sup> by Cepinkas et al.,<sup>88</sup> and in a new EOOSC Future online training module.<sup>89</sup>

### 3.3.5 Including training materials in the 4CH Knowledge Base

For this stage of the project, training materials can be integrated into the 4CH Knowledge base by following these steps:

1. Newly developed materials or materials that were not previously published should be shared in a repository. Guidelines for choosing a repository are discussed in WP5 (see also section 3.3.4), but for training materials at this stage it is most important to get a PID. Zenodo is a relevant and useful platform in this sense. Try to add as much metadata as possible to the Zenodo record.
2. Collect the minimum required metadata (section 3.3.3), ideally fill in all the fields. Make sure the link to the materials in their repository is included, using the PID link rather than the URL (e.g. the DOI rather than the Zenodo page). You can for example use the template (T4.3 Appendix 7 *Learning resources metadata template*). At this point in the project, you can provide the metadata in multiple formats, as long as these can be converted to XML, such as CSV or JSON (you can also provide it directly in XML).
3. Submit the files by uploading them to one of the shared folders prepared by the Knowledge Base team (T3.4), together with indications regarding the standard and vocabularies used for encoding training data and other details useful for the mapping activity. The KB team will implement the necessary operations of conversion and alignment of the training information with the 4CH Ontology, and the subsequent ingestion of the new data into the catalogue infrastructure to be made interoperable with the other data present and made accessible through the integrated search functions of the Knowledge Base.

We recommend that, going forward, an online service is developed whereby users can fill in and upload metadata of training materials easily through a web browser, with a set of guidelines. This should then be checked by a human for completeness, relevance, and quality.

### 3.3.6 Examples of 4CH training materials to be integrated

The 4CH partners have useful training materials available that can, and should, be integrated into the 4CH Knowledge Base. In addition, T4.3 has identified external relevant materials of which the metadata can be integrated as well (T4.3 Appendix 5 *Examples of existing learning resources to be integrated in the 4CH Knowledge Base*). Because the Knowledge Base is aggregating metadata of

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<sup>86</sup> Garcia et al. (2020) Ten simple rules for making training materials FAIR; See also: <https://tess.elixir-europe.org/materials/ten-simple-rules-for-making-training-materials-fair>

<sup>87</sup> <https://elixir-fair-training.github.io/FAIR-training-handbook/>

<sup>88</sup> Cepinkas, Linas. (2021). Checklist for depositing training materials into Zenodo (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5494526>

<sup>89</sup> Accessible through openplato.eu, Train-the-Trainer module 4.

resources, not acting as a repository or training materials (files), it is possible to simply link to existing resources without copyright issues. Nonetheless, we have selected resources that have an open licence as much as possible to avoid barriers to the 4CH users.

One of the pathways for 4CH training materials is through the partners. For example, for the topic of ontologies, and specifically the ontology most relevant to cultural heritage, CIDOC CRM, we identified some existing resources, of which the metadata have been collected for integration into the 4CH Knowledge Base (as described in section 3.3.5). But while these are very useful, they consist of a recorded lecture and slides.<sup>90</sup> As discussed in section 3.2, it is important to not just use ‘sending’ learning methods, but people learn better through interactive training. In this respect ‘OntoMatchGame’ is an excellent addition. 4CH partner Olivier Marlet (consortium Huma-NUM MASApplus) and colleagues developed first a tabletop card game, which was made into a downloadable version in 2021, available through the website dedicated to the game (<https://www.cidoc-crm-game.org/>). Since then, due to the success of using the game to teach CIDOC-CRM, an online version of the game was developed, called OntoMatchGame, in which CIDOC as well as data mapping can be learnt through various scenarios.<sup>91</sup> By integrating the metadata for the CIDOC CRM presentation as well as the metadata for the OntoMatchGame, using relevant keywords (like “CIDOC CRM”), enables 4CH users to use the materials: Trainers can find these materials through the 4CH KB and develop a comprehensive training giving information as well as practising with their trainees, and practitioners can use the training materials directly to learn about CIDOC and mappings.

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<sup>90</sup> <https://www.cidoc-crm.org/cidoc-crm-tutorial>

<sup>91</sup> <https://ontomatchgame.huma-num.fr/>; Marlet, O. (2023). OntoMatchGame: online card game to learn CIDOC and mappings.



### **3.4 4CH training to be developed: the 4CH curriculum framework for training**

Chapter 3 of this Deliverable describes the 4CH training system, in this section we explore the 4CH curriculum framework for training in digitisation. The aim is to support the development of knowledge, skills and competencies relevant for the cultural heritage professionals, researchers and organisations.

This framework is based on work carried out in the project and described elsewhere in this Deliverable on users, user needs and user profiles. It aims to provide a comprehensive framework covering the training topics at each stage in a digitisation project, with a special focus on the high-ranked needs identified in section 3.2.3

#### **3.4.1 User profiles and training needs**

Task 4.3 has identified three broad training profiles: Policy maker, Manager, and Practitioner (section 3.2; Fig. 3.5). These profiles reflect stages in a person's professional development and career and there is often no direct relationship to their job titles. For example, a curator can be the head of a national museum (e.g., the Louvre), the head of a team responsible for digitising or someone starting their first job at a small local museum.

Each has different training needs. The head of the Louvre is a 'policy maker' who might benefit from information about new technologies so they can develop policies and programmes for the museum. The head of a team leading on digitisation is a 'manager' who might be looking for specific training on a technology so they can plan a digitisation project in depth. While a new recruit is a 'practitioner' who might need to develop new skills.

These are the extremes, the experience of people working in the cultural sector is complex and multi-faceted. A curator may need training in leadership and policy-making, and also benefit from a practical introduction to new techniques. Thus the profiles are to help guide people to training which is the best match for their needs at the time.

## Policy Maker

*Skills for sustaining strategic long term goals, awareness of benefits and challenges, cultivating opportunities*

- Minister of Culture
- CEO of Cultural Organisational
- Member of Board of Directors
- Head of Department (policy)

## Manager

*Skills to plan and manage digital projects and pull in sectoral support*

- Head of Department (managerial)
- Programme/Project Manager

## Practitioner

*Skills to plan and execute technical tasks individually and as part of a team*

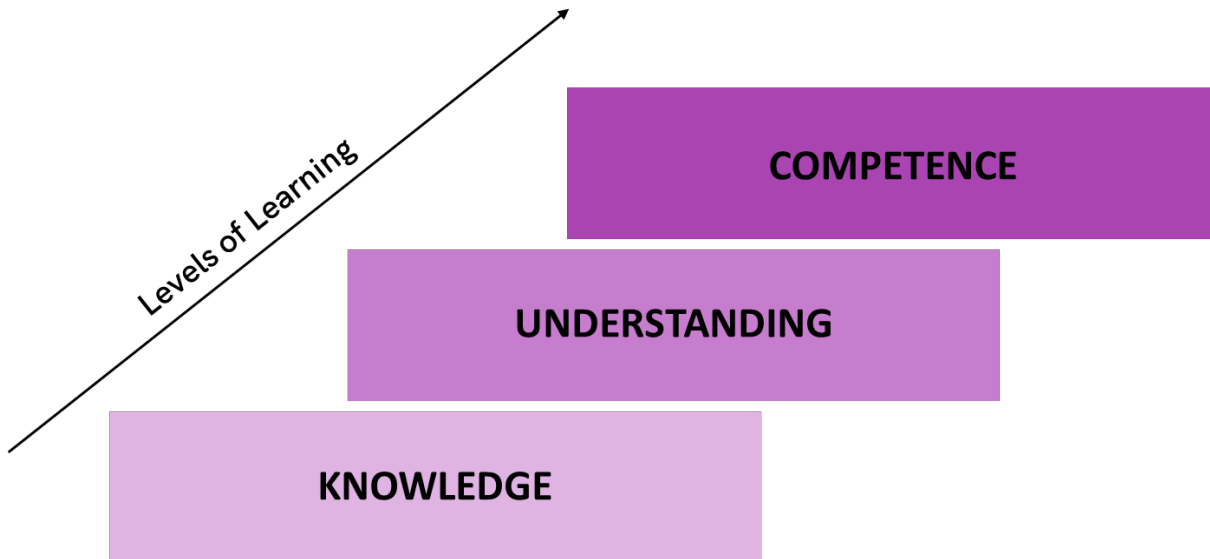
- Digital Specialist
- Documentation
- Researcher
- Curatorial Assistant
- Volunteer

Figure 3.5. 4CH User Profiles and potential job roles.

The 4CH approach also recognises that there are different levels of learning. A policy maker may require knowledge of the possibilities of 3D digitisation, while a manager needs deeper understanding to plan and manage projects, and a practitioner needs to be competent in their use of a particular piece of equipment or type of software to participate actively in the digitisation project. Terminology used for the varying learning levels include **Knowledge**, **Understanding** and **Competence**. These learning levels are defined in D4.2 'Definitions', building upon one another and are visualised in Figure 3.6:

- **Knowledge** is defined as the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual. Knowledge as a level of learning is the awareness of topics which support wider organisational policies or build upon learning for career progression.
- **Understanding** is greater comprehension to direct and supervise relevant tasks and projects.
- **Competence** is defined as the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is

described in terms of responsibility and autonomy. Competence as a level of learning implies mastery of skills directly related to a role.



*Figure 3.6. Levels of learning required by different user profiles at various stages of digitisation projects.*

Within an organisation, and the team involved in a digitisation project, staff have different training profiles and require different levels of ‘competence’, ‘understanding’ and ‘knowledge’. The 4CH framework aims to be comprehensive and to offer a point of entry for organisations and users both requiring oversight/general knowledge and those requiring the detailed and in depth skills required for the specific digitisation project to succeed.

### **3.4.2 Framework for training in digitisation**

The 4CH curriculum framework for training in digitisation is designed to reflect stages in a 3D digitisation project, the subjects and topics relevant for each stage, and the user profiles and skill levels appropriate to the profile for each topic. Each user profile will acquire a minimum level of knowledge as an outcome of engaging in the ‘Stages’ identified (Policy, Initiating, Planning, Executing, Management). The breakdown of the Stages is illustrated in Figure 3.8 together with the main ‘Subjects’ (Policy makers, Manager, Practitioner). User profiles are identified with an overall learning level (Knowledge, Understanding, Competence) outcome for each Stage.

User profile has been designated a colour, first visualised in Figure 3.2 and Figure 3.5. Figure 3.7 identifies each Stage with the user profile requiring the most Competence.

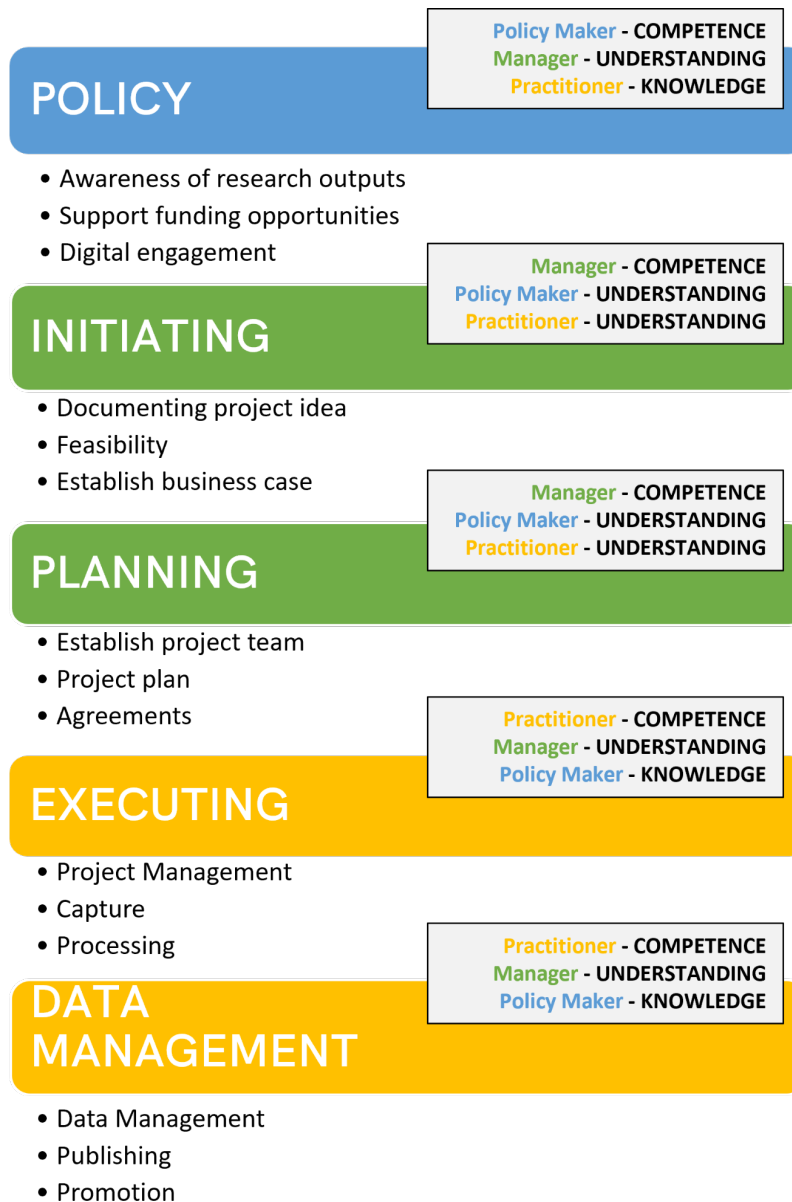


Figure 3.7. Breakdown of 4CH New Training Stages in relation to the 4CH user profiles and learning level outcome.

Subjects within each Stage are broken down into Topics which further detail the expected learning level outcome each user profile is expected to achieve. The Stages are described with relevance to the 4CH curriculum, user profile learning levels for each Subject and the expected skills developed after training. Topics are labelled for collation into training delivery packages, detailed in section 3.4.4.

## Policy

The Policy stage lays the foundation for initiation and success of digitisation projects. This Stage involves developing organisational strategy for 3D digitisation which comprehends the challenges, benefits and opportunities. Training in areas of policy are integral for initiation of 3D digitisation projects and their ability to maximise their potential. Users who fall into the ‘Policy Maker’ profile therefore benefit from a level of ‘Knowledge’ of digitisation and the ‘Understanding’ needed to direct and supervise the organisational aspects (such as integration of 3D digitisation in programmes, financial aspects including sources of funding, communications and opportunities for impact).

The training ‘Subjects’ relevant to the ‘Stage’ include:

*Table 3.4. Subjects and levels of learning for the 4CH User Profiles during the Policy Stage.*

POLICY (PO)	Practitioner	Manager	Policy Maker
<b>PO1 Research Outputs</b>	Understanding	Understanding	Competence
<b>PO2 Funding opportunities</b>	Knowledge	Understanding	Competence
<b>PO3 Digital engagement</b>	Understanding	Understanding	Competence

*Table 3.5. Detail of Subjects with expected Skills during the Policy Stage.*

PO1 Research Outputs	PO2 Funding opportunities	PO3 Digital engagement
<p><b>PO1.1</b> Awareness of the wider benefits for the organisation</p> <p><b>SKILLS:</b> - awareness of demands from tourism, education, business and other sectors; understanding of the needs from those sectors (copyright, licencing, accessible content and formats); - the ability to develop policies for the organisation (e.g. education and outreach); developing policies to respond to climate change and other national/international</p>	<p><b>PO2.1</b> Awareness of funding opportunities and their potential</p> <p><b>SKILLS:</b> awareness of funding bodies and opportunities for funding digitisation projects, understanding of funder’s interests, requirements and goals</p>	<p><b>PO3.1</b> Communities and outreach</p> <p><b>SKILLS:</b> Understanding the audience; Communities, users and user interests; Diversity and inclusion; Access and accessibility; Opportunities for re-evaluating the collection, new forms of outreach</p>
<p><b>PO1.2</b> Awareness of technology development and state of the art</p>	<p><b>PO2.2</b> Awareness of interdisciplinary/cross sector funding opportunities and projects</p>	<p><b>PO3.2</b> Access to data and content data for accessible research</p>

PO1 Research Outputs	PO2 Funding opportunities	PO3 Digital engagement
<p><b>SKILLS:</b> Innovation management (the ability to be innovative in the use of technology to maximise the benefits for the organisation).</p> <ul style="list-style-type: none"> <li>- Risk management (awareness of the risks of adopting new technologies and the ability to put in place measures to mitigate the risks)</li> <li>- Change management (understanding that introducing new technology involves change in working practices and the ability to put in place measures to manage those changes for the people involved)</li> <li>- Training and staff development (planning and identifying sources of training and enabling staff to develop new skills)</li> </ul>	<p><b>SKILLS:</b> areas of impact among other sectors, digital heritage as a lens to contribute to interdisciplinary research opportunities</p>	<p><b>SKILLS:</b> Understanding of research potential; portals, platforms and cross-sector access; broad understanding of interoperability; potential to, contribute to large scale research/projects, downloadable accessible content adds to scientific contributions - accessibility of digital materials for comparison and analysis versus physical</p>
<p><b>PO1.3</b> Digital Leadership</p> <p><b>SKILLS:</b> leadership; prioritising collections for digitisation; - developing content strategies for conservation, preservation and valorisation</p> <ul style="list-style-type: none"> <li>- managing change</li> <li>- leadership</li> <li>- prioritising collections for digitisation</li> <li>- copyright, licencing and access policies</li> </ul>		<p><b>PO3.3</b> Omnichannel approach to digital heritage engagement</p> <p><b>SKILLS:</b> diversifying digital content delivery and outreach, supporting established programmes, engaging in person and online visitors with rich experiences and exclusive content, support multimodal engagement strategies</p>

## Initiating

The Initiating Stage is when the project idea is developed, its feasibility is assessed and the business case for the digitisation project is made to the relevant authorities. Preliminary research and analysis formulates strategy for success and sustainability of organisational investment. Users who fall in Manager profiles require the highest degree of learning as this Stage scopes feasibility and considers capacity for success.

The training Subjects relevant for this Stage include:

Table 3.6. Subjects and levels of learning for the 4CH User Profiles during the Initiating Stage.

INITIATING (I)	Practitioner	Manager	Policy Maker
I1 Project Idea	Understanding	Competence	Knowledge
I2 Feasibility	Understanding	Competence	Understanding
I3 Business Case	Knowledge	Competence	Understanding

Table 3.7. Detail of Subjects with expected Skills during the Initiating Stage.

I1 Project Idea	I2 Feasibility	I3 Business Case
<p><b>I1.1 Project objectives</b></p> <p><b>SKILLS:</b> analysis of value and need for digitisation; main objectives (e.g. conservation, preservation, education, etc); identify and prioritise collections/sites for digitisation</p>	<p><b>I2.1</b> Practicalities, constraints, organisational capacity</p> <p><b>SKILLS:</b> identifying potential obstructions, physical requirements (e.g. for object handling), any legal issues or other potential constraints; planning strategies needed to manage these (e.g. negotiating access, sourcing equipment or staff to handle objects appropriately, scheduling seasonal work and so on), identifying resources required, timelines, allocation of time and space, managing travel.</p>	<p><b>I3.1</b> Business needs and expected outcomes</p> <p><b>SKILLS:</b> Relating the project objectives to the broad goals and objectives of the funder (internal or external); clearly identifying the business needs to be fulfilled by the project; Communicating the potential (current and future) value of investment, access, engagement, research, digital collections</p>
<p><b>I1.2</b> Identify key stakeholders and their needs</p> <p><b>SKILLS:</b> understanding the target audience and how they will use the digital; identifying specific requirements (e.g. quality and level of detail, formats and type of access, licence conditions, etc.), understanding internal audiences and their requirements (staff and volunteers), understanding external stakeholders (e.g. funding bodies, national and international bodies) and their needs and expectations; identifying experts (e.g. policy and technical advisors)</p>	<p><b>I2.2</b> Digital skills, hardware and software required</p> <p><b>SKILLS:</b> evaluating whether to carry out the project in house or by external contractors; selecting digitisation methods in relation to project objectives and the object(s) to be digitised; cost-benefit analysis (cost, time, skills and outputs)</p>	<p><b>I3.2</b> Pathways to Funding - internal funding or external opportunities</p> <p><b>SKILLS:</b> use cases, degrees of cost, justification (exhibition, research, risk, access, audience), external funding opportunities (sectoral, national, regional, thematic, innovation, research)</p>

## Planning

The Planning stage is integral for preparation of a successful digitisation project. During this Stage's activities an implementation strategy will be designed, tasks, allocation of resources and agreements need to be defined. The Manager user profile requires competency for this Stage. However, as application of the project will reside with Practitioners their level of learning needs to be high.

The training Subjects relevant for this Stage include:

*Table 3.8. Subjects and levels of learning for the 4CH User Profiles during the Planning Stage.*

PLANNING (PL)	Practitioner	Manager	Policy Maker
<b>PL1 Establish Project Team</b>	Understanding	Competence	Knowledge
<b>PL2 Project Plan</b>	Understanding	Competence	Knowledge
<b>PL3 Agreements</b>	Understanding	Competence	Knowledge

*Table 3.9. Detail of Subjects with expected Skills during the Planning Stage. Skills listed with an asterisk (\*) relate to areas of concern noted by participants whose feedback was reported in D1.2 (see section 3.2).*

PL1 Establish Project Team	P2 Project Plan	P3 Agreements
<p><b>PL1.1</b> Internal team selection</p> <p><b>SKILLS:</b> tasks to assign (project management, digitisation, object handling, documentation, processing, ingress data to archive, digital curation)</p>	<p><b>PL2.1</b> Project Scope</p> <p><b>SKILLS:</b> outline purpose, timelines, resources, people, tasks, skills, expected outcomes</p>	<p><b>PL3.1</b> Copyright</p> <p><b>SKILLS:</b> recognition of terms and scope, negotiation, contractual agreements (external)</p>
<p><b>PL1.2</b> External team selection</p> <p><b>SKILLS:</b> Tasks to assign; Invitation to tender, evaluation of tenders, appointment of external supplier; Contracts; Monitoring; Management of finances</p>	<p><b>PL2.2</b> Project standards and specifications</p> <p><b>SKILLS:</b> metadata and media*, introduction to FAIR Principles, implications for access and engagement, outputs based on project aims</p>	<p><b>PL3.2</b> Licensing</p> <p><b>SKILLS:</b> constraints of licences, pathways for selection, Creative Commons*</p>
<p><b>PL1.3</b> Internal team liaise with external team - requirements and parameters</p> <p><b>SKILLS:</b> tasks to assign (project management, object handling, documentation, ingress data to</p>	<p><b>PL2.3</b> Object selection</p> <p><b>SKILLS:</b> values, parameters and levels of success, adaptations, priority list, digitisation methods</p>	<p><b>PL3.3</b> Access to CH sites</p> <p><b>SKILLS:</b> reaching agreements with landowners for access to CH for digitisation, negotiation</p>



archive, digital curation, liaise with external team if required)		
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## Executing

The Executing Stage covers the physical activities of a digitisation project. The project team carries out digitisation tasks, producing 3D models and managing data, and also communicates with each other, the client and key stakeholders. Practitioners lead activities at this Stage and require the highest level of learning, while the project Manager requires understanding to supervise activities and to monitor the objectives and timescales.

The training Subjects relevant for this Stage include:

*Table 3.10. Subjects and levels of learning for the 4CH UserProfiles during the Executing Stage.*

EXECUTING (E)	Practitioner	Manager	Policy Maker
<b>E1 Project Management</b>	Competence	Competence	Knowledge
<b>E2 Capture</b>	Competence	Understanding	Knowledge
<b>E3 Processing</b>	Competence	Understanding	Knowledge

*Table 3.11. Detail of Subjects with expected Skills during the Executing Stage. Skills listed with an asterisk (\*) relate to areas of concern noted by participants whose feedback was reported in D1.2 (see section 3.2).*

E1 Project Management	E2 Capture	E3 Processing
<b>E1.1</b> Coordination of tasks  <b>SKILLS:</b> Allocation of tasks and resources, time management, financial management	<b>E2.1</b> Digitisation instrument operations  <b>SKILLS:</b> technical operational skills, workflows	<b>E3.1</b> Pre-processing and Processing of captured data  <b>SKILLS:</b> data review, technical software operational skills, adaption to workflows, problem solving
<b>E1.2</b> Monitoring project objectives  <b>SKILLS:</b> setting and monitoring achievable milestones, reporting progress (internal), reporting for funding bodies	<b>E2.2</b> Object Handling  <b>SKILLS:</b> risk assessment*, methods and equipment, staff training, mitigation, changes to object list, analyse digitisation constraints	<b>E3.2</b> Visual Enhancement  <b>SKILLS:</b> modelling, texturing, augmentation, animation, annotation
<b>E1.3</b> Risk management	<b>E2.3</b> Troubleshooting	<b>E3.3</b> Export of data

<b>SKILLS:</b> identifying risks, mitigation strategies, identifying solutions	<b>SKILLS:</b> situational and technical problem solving, use cases for adaptability	<b>SKILLS:</b> qualities and formats suitable for intended purpose, workflows
	<b>E2.4 Documentation</b>  <b>SKILLS:</b> capture metadata and paradata (environmental conditions, instrument settings etc.), standards, ontologies, monitoring, validation and quality control.*	<b>E3.4 Documentation</b>  <b>SKILLS:</b> capture metadata and paradata (processing selections, file formats), standards, ontologies, monitoring, validation and quality control.*

## Data Management

The Data Management Stage runs for the duration of the project and is vital for its success. The project manager communicates with team members and clients. Those Practitioner roles within the team maintain, publish and promote data produced for it to be useful to the team, organisation and the wider communities and audiences who are eager to interact with new media.

The training Subjects relevant for this Stage include:

Table 3.12. Subjects and levels of learning for the 4CH User Profiles during the Data Management Stage.

DATA MANAGEMENT (DM)	Practitioner	Manager	Policy Maker
DM1 Data Management	Competence	Understanding	Knowledge
DM2 Publishing	Competence	Understanding	Knowledge
DM3 Promotion	Competence	Competence	Knowledge

Table 3.13. Detail of Subjects with expected Skills during the Data Management Stage. Skills listed with an asterisk (\*) relate to areas of concern noted by participants whose feedback was reported in D1.2 (see section 3.2).

DM1 Data Management	DM2 Publishing	DM3 Promotion
<b>DM1.1</b> Preparing a Data management plan  <b>SKILLS:</b> Identifying the data that will be created and used during the project; Data standards, types and formats; File naming conventions; Version control; Documenting the data (metadata, paradata, metadata)	<b>DM2.1</b> Publishing data online  <b>SKILLS:</b> Understanding of the organisations content and outreach strategy; Internal publication (Content Management Systems, institutional website); Awareness of online platforms (e.g. national and	<b>DM3.1</b> Aggregation to digital repositories  <b>SKILLS:</b> Analyse repositories features and terms, align to requirements (file formats, metadata, agreements), potential of broader reaching platform

DM1 Data Management	DM2 Publishing	DM3 Promotion
standards to be followed)*; Identifying any ethical considerations or requirements for formal consent; understanding data ownership; Identifying who is responsible for implementing the data management plan; identifying a repository for long term preservation of the archive.	international culture portals, 3D platforms etc.)*; Social media platforms; Metadata good/better/best practice recommendations* (metadata schemas, identifiers, controlled vocabularies, Linked Open Data, multilinguality, interoperability); Metadata for search and discovery*	
<p><b>DM1.2</b> Storage and Backup</p> <p><b>SKILLS:</b> Identifying where the data will be stored during the project; analysing current/prospective Content Management Systems (CMS) and/or archiving platforms*; Backup procedures and responsibilities; Access rights and permissions during the project; develop organisational procedures for 3D archive</p>	<p><b>DM2.2</b> FAIR Principles</p> <p><b>SKILLS:</b> Understanding the FAIR Principles guidelines and FAIRification Framework</p>	<p><b>DM3.2</b> Creative Proposals and New Opportunities</p> <p><b>SKILLS:</b> research into reuse use cases*, developing relationships with education, businesses for projects, collaborative projects, organisation of events, scanathons, exhibitions, outreach and educational activities*</p>
<p><b>DM1.3</b> Integration of 3D data into CMS</p> <p><b>SKILLS:</b> align with organisational identifiers*, associations*, content ingestion, metadata capture, user management</p>	<p><b>DM2.3</b> Use and reuse</p> <p><b>SKILLS:</b> Understanding how to maximise the potential uses of digital content, quality and versions for proposed use*; Understanding user needs and experiences within context of outputs (simple, annotated, virtual reconstruction)</p>	<p><b>DM3.3</b> Public platforms for promotion</p> <p><b>SKILLS:</b> Analyse online platforms features and terms*, embedding and sharing, managing public collections, interaction with users and ecosystem</p>
<p><b>DM1.4</b> Archiving and Long term preservation</p> <p><b>SKILLS:</b> Awareness of long term preservation (formats, future migrations, storage, access, Core Trust Seal certification and the World Data system); Identifying a Digital Repository for long term preservation*; Understanding deposit requirements (e.g. for structuring datasets, file naming, metadata, licences); Selecting data for preservation (raw</p>	<p><b>DM2.4</b> Academic publication</p> <p><b>SKILLS:</b> requirements*, ORCID IDs, Zenodo DOI, topic specific journals, heritage sector outlets, journals which embed 3D</p>	<p><b>DM3.4</b> Procedure for research requests</p> <p><b>SKILLS:</b> Develop and impart policy, sharing datasets, support external collaboration</p>

DM1 Data Management	DM2 Publishing	DM3 Promotion
data, images, formats, registration data, metadata, processed data, versions, annotations, textures, associated media, etc); Frameworks for large volumes of data*; Evaluating the cost of archiving (time and effort, deposit charges).		
		<b>DM3.5</b> Demonstrating impact and outreach  <b>SKILLS:</b> monitoring metrics, evaluation, develop and document new events and activities

### 3.4.3 Using the 4CH curriculum framework for training in digitisation

Organisations and/or Learning providers can use the 4CH framework to support the development of different types of training. The idea of the curriculum is to help inform an organisation's training and development plan for staff and their careers. The User Profiles, Stages, Subjects and Topics can be used to identify and direct the learning required by team members for successful digitisation projects. Learning providers can combine Topics into workshops or learning materials to deliver relevant training adapted to the organisation's needs. The design of each workshop or material is dependent on the situation and needs of learners for Knowledge, Understanding or Competence in a topic.

Example Sessions:

Introduction to 3D Digitisation

- **I1.1** Project objectives
- **I1.2** Identify key stakeholders and their needs
- **I2.1** Practicalities, constraints, organisational capacity
- **I2.2** Digital skills, hardware and software required
- **I3.1** Business needs and expected outcomes
- **I3.2** Pathways to Funding - internal funding or external opportunities

Supporting 3D Digitisation

- **PO1.1** Understanding organisational and the wider benefits
- **PO1.2** Awareness of technology development and state of the art
- **PO1.3** Digital Leadership

- **PO2.1** Awareness of funding opportunities and their potential
- **PO2.2** Awareness of interdisciplinary/cross sector funding opportunities and projects
- **PO3.1** Communities and outreach
- **PO3.2** Access to data and content data for accessible research
- **PO3.3** Omnichannel approach to digital heritage engagement

#### Planning a Digitisation Project

- **PL1.1** Internal team selection
- **PL1.2** External team selection
- **PL1.3** Internal team liaise with external team - requirements and parameters
- **PL2.1** Project Scope
- **PL2.2** Project standards and specifications
- **PL2.3** Object selection
- **PL3.1** Copyright
- **PL3.2** Licensing
- **PL3.3** Access to CH sites
- **E1.1** Coordination of tasks
- **E1.2** Monitoring project objectives
- **E1.3** Risk management
- **DM1.1** Preparing a Data management plan

#### Data Capturing

- **E2.1** Digitisation instrument operations
- **E2.2** Object Handling
- **E2.3** Troubleshooting
- **E2.4** Documentation

#### Data Processing

- **DM2.3** Intended use of assets
- **E3.1** Pre-processing and Processing of captured data
- **E3.2** Visual Enhancement
- **E3.3** Export of data
- **E3.4** Documentation

#### Data Management and Storage

- **DM1.2** Storage and Backup
- **DM1.3** Integration of 3D data into CMS
- **DM1.4** Archiving and Long term preservation
- **DM2.1** Publishing data online
- **DM2.2** FAIR Principles

#### Access and Promotion

- **DM2.3** Use and reuse

- **DM2.4** Academic publication
- **DM3.1** Aggregation to digital repositories
- **DM3.2** Creative Proposals and New Opportunities
- **DM3.3** Public platforms for promotion
- **DM3.4** Procedure for research requests
- **DM3.5** Demonstrating impact and outreach

#### 3.4.4 Delivery Modes

Training can be delivered successfully in person, through remote or online learning or by a combination of the two. There are benefits in all these modes. Offering different opportunities for people to access training helps to accommodate different user profiles, learning styles and the personal circumstances of learners. In the context of continuing professional offering a range of delivery formats and opportunities to access learning is ideal.

In-person training involves trainees taking time out from their normal jobs for periods of time (which can pose a barrier) but enables them to collaborate with other learners more easily and to meet face-to-face with expert instructors. Practical skills in particular can benefit from working hands-on in an in person setting. Collaborative and practical learning can be set up virtually and delivered online, but some people find it difficult to participate actively in remote settings. Collaborative training facilitates peer-tutoring especially where the group tackle challenging tasks and discover solutions together.

Online learning enables learners to develop skills at their own time and pace. Offering recordings, supporting materials and structured guides allows people to develop proficiencies over time.

Modes of delivery include:

##### **Distance learning formats**

- Live (synchronous) remote demonstration
- Live (synchronous) webinars
- Live (synchronous) online training workshops
- Previously recorded demonstrations or webinars
- Supporting materials (digital file or shown)
- Asynchronous (self-paced) online course (e.g. a moodle course)

##### **In-person learning formats**

- Workshops / courses<sup>92</sup>: Lectures and demonstrations (live or recorded) with hands-on experience and other activities
- Supporting materials (digital, printed or shown)

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<sup>92</sup> Workshops are shorter, courses are typically spread over multiple events/days, this is further covered below.

### Combination formats

- In-person workshop with continuation using distance formats



*Figure 3.8. Examples of supporting materials.*

### Length of training

The 4CH curriculum framework can support the development of one-off short-length training sessions (e.g. a one-day online or in-person workshop or a 1-2 hour webinar) and also longer programmes of training.

The choice is dependent on the level of learning and or the capacity development needed by an organisation and/or an individual learner. Opportunity also plays a part. A one-day workshop can help an individual to raise their level of awareness and Knowledge of the subject and may pave the way to further learning in future.

Taking a short series of courses facilitates Understanding and helps learners to progress towards Competence in specific topics. Accessing remote learning and supporting materials helps to reinforce and deliver additional learning at a learners own pace. A longer training programme can deliver more structured skills and higher levels of learning giving learners time to build confidence towards mastery.

### Training offers

Single workshop  
Short series course  
Long series of courses  
Supporting materials (video, documents)

### 3.4.5 Assessment

4CH recommends that each training offer (whether a one-off course or a longer programme) should be assessed to evaluate how well it has delivered the expected learning by competency, understanding or knowledge.

- Training should be assessed on the following topics:
  - Applicability of training to desired skills/knowledge (quantitative & qualitative)
  - Change in skills/knowledge (quantitative)
  - Identify areas for continued learning (quantitative & qualitative)
  - Identify areas for experimentation (qualitative)

### 3.4.6 Potential users of the 4CH curriculum framework

The potential users of the 4CH curriculum framework are:

- Education and learning providers wishing to develop training in digitisation tailored for cultural heritage organisations (Higher, Further and Secondary education, Technical education and Commercial learning providers).
- Cultural Heritage Organisations wishing to support the learning and development of their staff and to expand their capacity in digital skills
- CH professionals and researchers wishing to develop and or improve their digital skills
- Ministries and Public bodies with responsibility for cultural heritage wishing to develop an overview of the training requirement for digitisation in the sector
- Volunteers and communities wishing to develop and improve their digital skills, and support local cultural heritage organisations.

### 3.4.7 Creating high-quality training content - some useful resources

It is recommended that any 4CH-affiliated trainer familiarises themselves with the pedagogical background of training and how to create inclusive training content. For the former, for example the FOSTER Open Science Training Handbook<sup>93</sup> or the EOSC Synergy Online Training Handbook<sup>94</sup> can be used. The latter also has a section on creating inclusive training content, or one can refer to the Open Learn Accessibility of e-Learning Course,<sup>95</sup> the W3C Web accessibility initiative,<sup>96</sup> and the new EOSC Future Train-the-Trainer course on the topic.<sup>97</sup>

<sup>93</sup> <https://www.fosteropenscience.eu/content/open-science-training-handbook>

<sup>94</sup> <https://moodle.learn.eosc-synergy.eu/course/view.php?id=15&section=0#tabs-tree-start>

<sup>95</sup> <https://www.open.edu/openlearn/education-development/education-careers/accessibility-elearning>

<sup>96</sup> <https://www.w3.org/WAI/fundamentals/accessibility-intro/>

<sup>97</sup> <https://openplato.eu/>



### 3.5. Summary of the recommendations and conclusion

In this chapter, the results of the work of Task 4.3 (T4.3) “Training services on the field of activities identified, with a specific focus on the area on which the Competence Centre (CC) will release protocols, guidelines or platform tools” were reported. The aim of this task is to define the 4CH training system and this chapter contains the essential foundations of the 4CH Training system: its target group, the main training topics and standards and procedures to document and manage learning resources. Chapter 3 discussed the transfer of knowledge and expertise related to the subject field of the CC for dedicated target groups. This was based on the outputs of other tasks in the project, especially the user needs survey (D1.2) and the analysis of other centres (D2.1), as well as on new analyses, for example based on relevant use cases.

A first aspect of the 4CH training system concerns the profiles of the target group, the users of the training facilities. We distinguish three broad **training profiles**: practitioners, managers and policy makers, each with its own existing expertise and specific training needs. Concerning the training topics, we first used the user needs survey to identify pressing **training needs** at a high level (section 3.2). The two main categories distinguished are (1) training that teaches practical digital skills related to project stages (policy, planning, capturing, processing, storage, access) and (2) training aimed at data management skills in general (data interoperability, metadata, use of controlled vocabularies). Subsequently, an in-depth and comprehensive framework was developed for each of the training profiles and by project stage (section 3.4). Organisations and/or learning providers can use the **4CH curriculum framework for training** to support the development of different types of training. The idea of the curriculum is to help inform an organisation’s training and development plan for staff and their careers. The User Profiles, Stages, Subjects and Topics can be used to identify and direct the learning required by team members for successful digitisation projects. Learning providers can combine Topics into workshops or learning materials to deliver relevant training adapted to the organisation’s needs. The design of each workshop or material is dependent on the situation and needs of learners for Knowledge, Understanding or Competence in a topic.

The organisation and structure of other, existing training systems, when based on thorough research, is a useful source of inspiration for the development of the 4CH training system. We therefore looked at how other relevant organisations organise their training activities. Based on this as well as the aims of the CC, we recommend:

- 1) a **searchable training (materials) catalogue** with rich, standardised metadata referring to both relevant, external learning resources and 4CH, internal resources. These resources can be used directly by 4CH users, or used for training delivery by 4CH partners.
  - 2) **training delivery** by 4CH partners, as distance, in-person, or combined (hybrid/blended) training formats, e.g. face-to-face or online training workshops (detailed in section 3.4.4).
  - 3) a **trainer/training organisation registry**.
- The details are discussed in section 3.3.

In order for the training materials and training events to be findable and discoverable, it is essential that **rich metadata** are used. The metadata we recommend for learning resources are based on the RDA Minimal Metadata for Learning Resources, with additions based on community inputs in the SSHOC and EOSC Future projects. The metadata can further be used to clearly indicate licensing. For training events we recommend to use rich metadata as well, as in the TeSS catalogue where the Bioschema profiles CourseInstance and Course are used. For integration into the 4CH Knowledge Base, any 4CH partner can recommend their own or an external training resource by providing the minimal metadata in the relevant shared folder (for this stage of the project).

## 4. Conclusions

The present document describes the research activities carried out by Tasks 4.1 “Procedures and protocols to access to CC services and consultancy” and the 4.3 “Training Services on the field of activities identified, with a specific focus on the area on which the Competence Centre will release protocols, guidelines or platform tools”, involved in WP4 - *Service deployment system*, reporting the main outcomes in terms of framework and essential foundation about the access procedures to the CC services and their main variables, and the 4CH Training system.

The T4.1 has provided a general framework from which to collect inputs and lessons learnt, useful for the detailed definition of services, as well as for supporting the identification of the variables that most influence the access procedures, that is to say: categories of users (individual/organisations), service categories (affecting the level of interaction), access type (remote/on-site), and charging fees (if applied). These main aspects have been described in a workflow represented as an abstract model, allowing for specialisations that derive from the modification of such parameters and further inputs. The research activities have resulted in a preliminary program of 4CH services that the CC will offer and a list of final remarks on the access procedures concerning: the use of the official web page as main point of access; the management of online services, datasets, collections and resources (e.g., training) by the 4CH operational structures (Platform, Cloud and Knowledge base); the strict dependency among access conditions and legal and business aspects; the potential role of national coordination nodes; the main variables influencing the level of accessibility of services; the forms (static/asynchronous, online, in person, etc.) and levels of interaction (direct or indirect); the opportunity of building on existing resources in addition of providing new ones.

T4.3 provided analysis-based recommendations regarding the 4CH training system, specifically regarding its users, training content, organisation & management, metadata, and a framework for developing 4CH training. Main conclusions are that structured metadata of relevant external and internal learning resources should be provided in the 4CH KB and that the NCCs, supported by the ECC, should organise training events. For the latter, the 4CH curriculum framework for training should be applied.

The results and the recommendations provided by T4.1 and T4.3 will support the activities of other Tasks and WPs directly related to services access, which will be concluded in the following phases of the project.

- WP2, in D2.2 - *Report on the planned organisation of the Competence Centre on Cultural Heritage* (expected at month 36, December 2023) will have to describe the organizational and operational structures of the European CC and its network of National Nodes in charge of the production, management, and delivery of services will be assigned. In particular, the preliminary programme of services and training activities, their access and delivery methods,

provide useful inputs to D2.2 supporting the definition of the responsibilities and roles at the different levels (the central hub and its Thematic Departments, the National Coordination Nodes). ) - Task 4.1 will also participate in the definition of the recruitment modalities of the National Communities.

- WP3, in D3.3 - *Final report on services and tools* (expected at month 36, December 2023) will report the final implementation of the CH Cloud (T3.1) and 4CH platform (T3.2), the integration of the INCEPTION 3D methodology (T3.3) and the other tools and services provided by the project (including the outcomes of T3.4 - Cultural Heritage Knowledge Base, T3.5 - Big Data Services and T3.6-Tools for storytelling. Such operational structures, as remarked in this document, will directly manage access to some services based on the use of enabling technologies and database consultation. The indications on how the 4CH training programs should be managed, the general methods of access envisaged for the entire portfolio of services, as well as the inputs collected from case studies, will support the fine-tuning implementation of these relevant infrastructures. The recommended metadata for learning resources have already fed into the 4CH KB model, which could be further expanded with recommended metadata for events (if relevant), and with recommended controlled vocabularies.
- WP6, in D6.1 - *Governance and legal structure description* and D6.2- *Strategic and Business plan and financial* (both expected at month 30, June 2023) will report respectively on the governance structure and legal form, and the business plan - covering the initial 5 years of operation. Considering the programme of services, the legal form is relevant from the point of view of the type of relationships that the CC will be able to establish with its partners/members of the National Nodes. The definition of the funding incomes (even considering any possible contributions deriving from the service provision) and the cost items of services (production, delivery and maintenance) may rely on the framework of indications, scenarios and information included in this document. With regards to training as a service, the CC could function as a central, EU-wide hub maintaining a Knowledge Hub with training materials, training event details, and a trainer registry, with partners / affiliated organisations delivering training and developing new training materials where needed.

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## Appendices (index)

### T4.1

Appendix 1 - Case studies: factsheets of analysis

Appendix 2 - Case studies: synthesis framework

Appendix 3 - User needs analysis and synthesis framework

Appendix 4 - 4CH services: preliminary program

### T4.3

Appendix 1- Training profiles

Appendix 2 - Training landscape analysis (Spreadsheet)

Appendix 3 - Training system use cases

Appendix 4 - Initial review of digital heritage training

Appendix 5 - Examples of existing learning resources to be integrated in the 4CH Knowledge Base (Spreadsheet)

Appendix 6 - Metadata for learning resources

Appendix 7 - Learning resources metadata template (a template to fill in training metadata to ingest into the 4CH Knowledge Base) (Spreadsheet)

## **T4.1 Appendix 1**

### **Case studies: factsheets of analysis**

Authors: Serena Orlandi, Rossella Roversi (UNIBO)

Key words: case studies, service deployment, service categories, CCs and similar institutions



## **NATIONAL CCS (EUROPE)**

**1. The Dutch National Centre of Expertise and Repository for Research Data (DANS)** **3**

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## **RESEARCH INFRASTRUCTURES**

**2. Digital Research Infrastructure for the Arts and Humanities (DARIAH ERIC)** **13**

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## **DOCUMENTATION CENTRES ON CH**

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## **Abstract**

**Category:** NATIONAL CCS (EUROPE)

**Sub-category:** \_

**Profile:** DANS is the Dutch national centre of expertise and repository for research data.

**Mission:** DANS encourages researchers to make their digital research data and related outputs Findable, Accessible, Interoperable and Reusable.

**Services:** DANS provides Data Management Services (VRE, digital archive, information systems), Training and Consultancy.

**Audience:** Researchers, Research communities, Data stewards (at universities, universities of applied sciences, and other research-producing) institutes, Trainers.

**Legal and funds:** DANS is a non-profit organisation receiving funding by the Royal Dutch Academy of Arts and Science (KNAW) and The Dutch Research Council (NWO). Project funding represents an additional income.

**Main Sources:** Official webpage: <https://dans.knaw.nl/en/>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 91-93) on Zenodo.

## **Highlights from the analysis of services**

### **1. PRESENTATION OF SERVICES**

The **description of services** and activities developed and delivered by the centre is provided in the official web page, in a dedicated section (header and footer toolbar menu). Specific info is provided in additional/thematic sections, supplemented by text forms for contacts. The contents are provided in multiple languages: Dutch (standard option) and English.

The **list of services** includes:

- Repository service: Domain-specific Data Stations allows deposit and search for data in several fields (Social Sciences and Humanities; Archaeology; Life, Health and Medical Sciences; Physical and Technical Sciences; the latter are currently in development, expected in 2023). A brief description, supporting info, the related FAQs and a text form to get in touch with a specific contact person/s are provided. Extensive information for depositors is available as web pages and documents (e.g. on-preferred formats, or metadata, etc.).
- ‘DataverseNL’: research data repository co-provided by DANS and participating institutions. A brief description, terms of use (e.g., fee, software, etc.) and a text form to get in touch with a specific contact person/s are provided.
- ‘Data Vault’: DANS backend repository. A brief description and a text form to get in touch with a specific contact person/s are provided.
- ‘Data expertise’. The section presents under main categories the areas of expertise of the centre: ‘FAIR and Open data’, ‘Research Data Management’, ‘Certification of digital archives’, ‘Monitoring and analysis’, ‘DANS Fellowship’, ‘Together with others’ (Participation in national and international projects and infrastructures), ‘Training and Outreach’, ‘Consultancy’, ‘Tools’.

A training website is under development and will provide information about and access to (metadata of) training materials.

- 'EASY': an online archiving system for depositing and reusing research data. A brief description, the link to the portal and a text form to get in touch with a specific contact person/s are provided. EASY was the DANS generic dataset repository, which is now being replaced by the domain-specific Data Stations, as described above.

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact and Help/support services** are managed from the official web page. General info email address, phone number and the address of the physical headquarter are provided in a dedicated section ('Contact'/'About DANS'/footer toolbar menu). The general presentation of the centre ('About DANS'/ header toolbar menu) includes direct email contacts of the staff and a link to a text form to be filled in for questions ('Ask your question').

To receive support/help, a text form is available in a dedicated page ('Ask your question'/ header toolbar menu): name, email and question are required. Support is provided on several topics (privacy declaration, disclaimer, legal info, rate info, provenance and data processing document, preservation plan, manual depositing data, manual reusing data, file formats). Each topic is addressed in a dedicated section ('Support'/ footer toolbar menu). For a specific service ('Data Station') a FAQs section is available. The contents are provided in multiple languages: Dutch (standard option) and English.

### 2.2. Communication

The centre provides a **general presentation** reporting info in a dedicated section ('About DANS'/ header toolbar menu), covering aspects that include: mission and focus, the team staff, the portfolio of services, annual reporting, and a text form for contacts. The single sections redirect to dedicated pages. The contents are provided in multiple languages: Dutch (standard option) and English.

**Legal information and privacy declaration** are described in a dedicated section ('Support'/footer toolbar menu). The section includes all the related info and terms of use for the different platforms and repositories used/managed by the centre. The contents are provided in multiple languages: Dutch (standard option) and English.

The **communication service** is managed through four main tools (News, Agenda, Social Media, Newsletter) from the homepage of the official website. The contents are provided in multiple languages: Dutch (standard option) and English.

The **'News'** section presents updates on several topics, tools, activities, and projects. For each item a brief description and a list of TAGS are provided. A link redirects to dedicated pages. The section includes only internal contents (curated and developed by the centre).

The **'Agenda'** gives access to a calendar of webinars, conferences, etc. (both internal and external). For each item a brief description, a list of TAGS and a link redirecting to a curated/dedicated page are provided. For internal events, also a text form for registration is available. The section includes both internal (curated and developed by the centre) and external contents (direct links to external pages).

The centre is featured on the **social media** platform Twitter and has an official YouTube channel. Direct links are provided from the home page (footer toolbar menu).

The domain-specific **newsletters** - called 'DataLink': the digital newsletter by DANS'- are accessible under the sign-up of a simple text form including e-mail, name and surname, affiliation and topic.

### 2.3. Dissemination

The centre makes available some **dissemination resources** (mainly reports and papers) from the web page ('Monitoring and analysis of the data landscape'/'Data expertise'/header toolbar menu).

**Other** important **channels for dissemination** refer to the 'News' services and the 'Collaborations' section, describing the involvement of the centre in several activities, projects and initiatives ('News'/header toolbar menu; 'Collaborations'/'About DANS'/header toolbar menu). The contents are provided in multiple languages: Dutch (standard options) and English.

### 2.4. Orientation, Guidance and Consultancy

The service is managed through several channels and accessible from a specific and curated section ('Data expertise'/header toolbar menu). '**Consultancy**' is presented as one of the services provided: advice and support, available on request using a text form ('Ask your question' section), cover several topics (e.g., embedding data management, Open Access and sharing of research data, implementation and assessment of management plans, tools to assess the FAIRness or reusability of data and obtaining a CoreTrustSeal certificate). The contents are provided in multiple languages: Dutch (standard option) and English.

**Orientation/Guidance** is provided on a specific topic (certification of digital archives) through a step-by-step guide available on an external dedicated website.<sup>1</sup> For data deposit, specific guidelines and step-by-step instructions are provided ('Data Station'/ header toolbar menu). The contents are provided only in the local language (Dutch).

## 3. TRAINING AND CAPACITY BUILDING

The **training service** is managed from the official web ('Training and Outreach'/'Data expertise'/ header toolbar menu). The centre regularly organises interactive workshops addressing several topics (data publishing, archiving, reusability and interoperability, research data management planning and tools, metadata, FAIR and Open Science). The available modules are listed and described in the 'Agenda' section. Filters allow the selection of specific contents and include both internal (e.g., live Q&A sessions every Monday - online, registration required) and external modules (e.g., Workshops, meetings, conferences, etc.). The specific terms of application are described in single dedicated/curated pages. Info on past events is available. Except for the general description, only some contents are provided in multiple languages (English and Dutch).

Training courses and materials are organised in collaboration with other institutions, links to the dedicated pages and info are provided. Each course/resource presents specific requirements. A new training web page (currently in development) will give more structured information on the training activities and how training materials can be accessed. A DANS Moodle page is now also available.

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<sup>1</sup> <https://wegwijzercertificering.nl/nl>.

- The ‘Essential 4 Data Support’ course is available in two versions: Online (free, available at all times, access to limited contents and under registration) and Blended (online + in person + final certification, under fee payment, scheduled on specific dates, under subscription). The contents are provided in both English and Dutch.
- The ‘DANS Data Game’ is available for free via an order form, accessible under registration using a dedicated platform. The contents are provided in multiple languages: Dutch (standard options) and English.
- ‘Data Management Expert Guide’ (DMEG) is available for free, without registration on the CESSDA platform. Additional training resources are available on dedicated platforms (documents on Zenodo, video on YouTube). The contents are provided in English (only).
- Webinar recordings are available through the DANS YouTube channel.
- Slides and other materials used during training workshops are made available through Zenodo.

#### 4. SUPPORT IN INNOVATION AND PROJECTS

##### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre gives access to several **tools and repositories** from the official web site (‘Data station’/header toolbar menu).

- Deposit and search for data are managed through the ‘EASY’ repository that is being replaced by four Data Stations: Archaeology, Social Sciences and Humanities, Life Sciences, Physical and Technical Sciences. Specific instructions on the different steps to be followed are provided in a dedicated section. Registration (free) is required for deposit and downloads research data, except for search and downloads open access data. A specific contact person is provided for questions through a text form. The contents are provided in English (only).
- Access to a research data repository co-provided by the centre and participating institutions (‘DateVerseNL’/‘Data station’/header toolbar menu). The service is available under registration and fee payment. The general information, terms of use, a text form for questions and a direct link to browse the platform are provided in a dedicated section. A demo version is available for demonstration, training and testing purposes. The contents are provided in English (only).
- Access to annual dashboards monitoring Open Science trends in Dutch (‘The Monitoring and analysis of the data landscape’/‘Data expertise’/ header toolbar menu): info, links and a text form for questions to direct contacts are available in a dedicated page. The contents are provided in multiple languages: Dutch (standard options) and English.
- Access to several online tools and resources for working with research data (‘Tools’/‘Data expertise’/ header toolbar menu), in particular: ‘FAIR-Aware’, a self-assessment tool consisting of 10 questions with additional guidance texts to help in becoming more aware of what to do to make data(set) as FAIR as possible. Instructions and direct contacts are provided. The contents are provided in English (only); ‘Text Fabric’, providing file format, data model, API and apps for processing texts and related annotations. The resources are available on Github. The contents are provided in English (only).

#### 4.2. Collaborative research (Projects) and Networking

The centre operates **networking** through two main channels. Info is available on the official website in dedicated sections ('Together with others'/'Data expertise'/header or footer toolbar menu). The contents are provided in multiple languages: Dutch (standard option) and English.

1. **Participation in national and international projects** and infrastructures, and working with partners and clients. A dedicated page includes a series of boxes reporting tags, the project title and a link to a dedicated section. For projects a brief description, the person in charge of the centre and a list of TAGS are provided. A link redirects to a dedicated page. The 'collaborating partners' section lists a selection of collaborations highlighting the specific relation with the centre.

2. **Offer of fellowships** through a long-term collaboration related to a concrete project in the field of long-term archiving. The list of honorary fellows and a text form for questions to a specific direct contact are available.

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION								3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication						2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enablig Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>												
											Public and private heritage institutions responsible for managing monuments and sites	
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization	
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professionals and SMEs providing services for preservation, conservation and restoration	
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Companies from the creative industry producing heritage-based content, apps, games, education and tourism services	
											Museums curators	
											Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional researchers	
											General and educational users and visitors, tourists	
											Others	
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>												
	<input checked="" type="radio"/>									<input checked="" type="radio"/>	Direct contacts (e-mail /Phone number)	
	<input checked="" type="radio"/>										E-mail	
							<input checked="" type="radio"/>				Focus Groups/taskforces/Thematic Departments	
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus/Dedicated Pages	
	<input checked="" type="radio"/>										General contact (Phone number)	
								<input checked="" type="radio"/>	<input checked="" type="radio"/>		Specific software/tool	
<input checked="" type="radio"/>	<input checked="" type="radio"/>			<input checked="" type="radio"/>		<input checked="" type="radio"/>		<input checked="" type="radio"/>		<input checked="" type="radio"/>	Text Form	





1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and ...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (internal): repository/ software /other web page		
					<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page		
<b>ACCESS CONDITIONS</b> <i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>												
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration required		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration Not required/foreseen		
										Optional Registration (to access a pro-version)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Free		
								<input type="checkbox"/>	<input type="checkbox"/>	Under Fee		
									<input type="checkbox"/>	Consortium members / Fellows/ Collaborators		
<b>LANGUAGE</b> <i>In which language(s) are the services/content/resources provided?</i>												
					<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	English (only)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Multiple languages, besides English		
							<input type="checkbox"/>	<input type="checkbox"/>		Language of the country of origin (only)		
<b>LINKS</b> <i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Link to external pages or resources		
<b>LEVEL</b> <i>What is the level of services/resources?</i>												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional		

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and ...
		About	Legal	News	Events	Social				
4.1. Enabling Tech....								4.2. Collaborative..		
					<input checked="" type="radio"/>			Non professional		
								<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>		
						<input checked="" type="radio"/>		In presence		
						<input checked="" type="radio"/>		Online/Distance		
								Asynchronous distance learning		
								Synchronous distance learning		
								Real-time distance learning/Streaming		
						<input checked="" type="radio"/>		Blended		
								<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>		
								5-15 minutes		
								15-30 minutes		
						<input checked="" type="radio"/>		1 – 2 Hours		
						<input checked="" type="radio"/>		1 Days (4/6 hours)		
						<input checked="" type="radio"/>		More Days		
								<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>		
						<input checked="" type="radio"/>		Yes		
						<input checked="" type="radio"/>		No		

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4) the main users to which the services and activities of the centre are addressed, are professional researchers. Other categories refer to professionals and SMEs providing services for preservation, conservation and restoration and companies from the creative industry producing heritage-based content, apps, games, education and tourism services. The services provided are directed to all categories of users.

**Supporting Tools/Structures:** Access to services is mainly managed from focus/dedicated sections. A text form, reporting a specific direct contact person, is used for many services. Access to specific technologies and training resources are managed through software/tools.

**Type of resources/contents:** In addition to contents directly reported on the official webpage, several types of supporting resources are used, in particular tools and datasets.

**Management:** The services are mainly managed by the official page with direct links to dedicated sections. Resources are made available both from internal and external repositories/platforms.

**Access conditions:** Most services do not require registration and are available free of charge. Access to specific/advanced level services (data deposit, advice, training) is provided under registration and/or upon request and/or for a fee. Collaborative research (project involvement) is reserved to partners or fellows.

**Language:** The contents are mainly provided in multiple languages: Dutch and English. Specific training resources, reports or guidelines are generally available either only in Dutch (the language of the country of origin of the centre) or only in English.

**Links:** Access to information, resources and materials is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The level of all services provided is professional.

**Delivery mode, timing and credits (only training):** The centre provides both online, in presence and blended training activities of variable timing (from 1-2 hours to periods of training). For specific courses, under fee payment, credits/certificate of attendance are assigned.

## Digital Research Infrastructure for the Arts and Humanities (DARIAH ERIC)



### Abstract

**Category:** RESEARCH INFRASTRUCTURE

**Sub-category:** \_

**Profile:** The Digital Research Infrastructure for the Arts and Humanities (DARIAH) aims to enhance and support digitally-enabled research and teaching across the arts and humanities. DARIAH is a network of people, expertise, information, knowledge, content, methods, tools and technologies from its member countries. It develops, maintains and operates an infrastructure in support of ICT-based research practices, and sustains researchers in using them to build, analyse and interpret digital resources. DARIAH was established as a European Research Infrastructure Consortium (ERIC) in August 2014, bringing together members from countries (EU Member States and Associated Countries) and intergovernmental organisations. Currently, DARIAH has 20 Members and 1 Observer. Several institutions from 6 non-member countries joined DARIAH as Cooperating Partners: Finland, Hungary, Norway, Slovakia, United Kingdom and the United States of America.

**Mission:** DARIAH's mission is to empower research communities with digital methods to create, connect and share knowledge about culture and society. DARIAH's strategy stands upon four pillars that derive from the mission and vision: build a marketplace to facilitate fluid exchange of tools, services, data and knowledge; build access to education and training; build working groups, hubs and other forms of transnational and transdisciplinary organisation; build bridges between research policy and communities of practice.

**Services:** DARIAH supports a wide range of services (often provided by members) and activities: working groups on strategic areas complementary to individual contributions from DARIAH members; training events coordination and resources creation; participation in several strategic EU funded projects; production of impact case studies; access to specific resources, datasets/repositories, tools and software, toolkits and guidelines.

**Audience:** Researchers, Research communities, Universities.

**Legal and funds:** DARIAH is a consortium funded by EU funding, cash contribution and the other in-kind contribution from partners, calculated according to specific principles.<sup>2</sup>

**Main Sources:** Official webpage: <https://www.dariah.eu/>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 95-97) on Zenodo.

### Highlights from the analysis of services

#### 1. PRESENTATION OF SERVICES

The **description of services** developed and delivered by the centre is provided in the official website. The four main activities (tools and services, training and education, open science, working

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<sup>2</sup> See [Appendix II. STATUTES OF DARIAH ERIC](#).

groups) are described in the home page using dedicated boxes: for each item a brief description and links to dedicated sections are provided. Other boxes redirect and refer to the general presentation of the centre, latest news, network and events sections. For specific activities a link to the 'HelpDesk' Text form is provided. The contents are provided in English (only).

- The 'Tools and services' section (header toolbar menu) includes a list of macro-categories of services (News and events, Publishing, Services, Teaching and Learning, Tools and Software). An additional section illustrates the contributions, in terms of services, resources and tools, developed by the consortium members through a digital application.
- The 'Activities' section (header toolbar menu) gives access to the different categories of transversal areas of agency of the centre: working groups, training and education, open science, projects, themes, and impact case studies.

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact service** is managed from the official website: an email address for general info is directly available on the homepage (footer toolbar menu), while the addresses of the different physical headquarters of the centre (Paris, Berlin, Dublin and The Hague), the same general email and a link to 'helpdesk' page (suggested as first option for contacts) are available in a dedicated 'Contact' section ('Contact DARIAH'/ header toolbar menu). Direct contacts or dedicated emails are provided for specific services or activities (e.g., single thematic working groups, publishing). For the centre team, info, position, area of expertise and direct email contact are described in a dedicated section (People/networking/header menu bar).

The '**helpdesk**' page (header or footer toolbar menu) includes a form to be filled in (name, email, subject, title of the message and text are required). The link to the same form is also provided in the dedicated pages of specific activities (working groups, training and education, open science). The contents are provided in English (only).

### 2.2. Communication

The centre provides a **general presentation** in a dedicated section of the official website ('About'/header toolbar menu) reporting info about: activity and impact; mission, vision and strategy; organisational overview; the centre history/path of creation; info about affiliation to the centre; documents (statutes and internal rules, strategic plans, annual reports and other documents). Each topic is addressed in a dedicated web page, providing extensive information and giving access to documents or reports, and/or redirecting to internal and external resources. The contents are provided in English (only).

**Legal and privacy notice** are described in two dedicated sections ('Privacy and Legal'/ footer toolbar menu). The 'privacy notice' sections include all the related info and terms of use for the different devices used by the centre (e.g., mailing list, newsletter, platforms and repositories). The contents are provided in English (only).

The **Communication** service is managed through four main tools (News, Events, Social Media, Newsletter) from the official website (header or footer menu bar/ boxes in home page).

The '**News**' section presents updates and news on different types of activities (e.g., publishing, conferences, summer schools, webinars, call for proposals, projects, etc.). For each item a brief

abstract and the date is provided: a link redirects to a dedicated page reporting detailed info, including registration link (if/when required). The section includes both internal (curated and developed by the centre) both external contents (in partnership with the centre). The contents are provided in English (only).

The **'Events'** section gives access to a calendar of workshops, conferences, webinars, etc. (curated and organized by the centre, both by partners on relevant topics), structured for months (both upcoming and past): a link redirects to a dedicated page including all the information. It is possible to add the event to your personal calendar. A device for browsing events by date and keywords is available. A specific section is dedicated to the annual event organized by the centre, redirecting to an external web page including all the info, also about past editions. The contents are provided in English (only).

The centre is present on the Twitter **social media** platform, LinkedIn, Flickr (used for pictures from the centre events) and has a YouTube channel (used for webinars). Direct links are available in the home page (footer menu bar). The contents are provided in English (only).

A text form for **newsletter** subscription is provided (footer menu bar or 'News & Events'/ header menu bar). The dedicated section includes: the privacy statement, a link redirecting to the newsletter archive, and the link to the text form for subscription (name, surname, email and affiliation). The monthly newsletter is organized in main sections (highlights, month's spotlight, training opportunities and resources, project news, save the date). The contents are provided in English (only).

**Extra channels of communication** in which the centre participates are: a blog representing dh-research-communities of Germany, Austria and Switzerland ('Tools and Services'/News & Events/ header menu bar) in German language; and the Open Access online announcement service in the humanities and social sciences 'Calenda' aimed at informing students, lecturers and researchers alike of the current state of research. The contents are provided in multiple languages (English, Spanish, French, Portuguese).

### 2.3. Dissemination

The **dissemination resources** on the centre main activities are available and can be downloaded in a dedicated section ('Documents'/'About'/header menu bar), including annual reports and strategic plans.

An **index of open access documents/publications** (papers, reports, etc.) produced by the consortium members - available from the two main repositories used by the centre (HAL and Zenodo) - is provided ('Publications'/'About'/ header menu bar): it is possible to browse the resources using filters (year, keywords, author, discipline, journal, institution). The resources can be downloaded without registration. Instructions are provided on how to contribute to the centre collections.

**Other important channels** for dissemination, describing the involvement of the centre in several activities, projects and initiatives, are presented ('News' and 'Events'/ header menu bar). The contents are provided in English (only).

### 2.4. Orientation, Guidance and Consultancy

The centre provides **orientation/guidance** on open science through several blogs and tools:

- The ‘DARIAH Open scholarly blog’, providing a single space where information around the emerging landscape of Open Humanities can be disseminated, discussed and evaluated. The blog is linked to the Hypotheses blog platform (<https://dariahopen.hypotheses.org/>);
- The ‘Heritage Data Reuse Charter scholarly blog’, linked to the ‘Hypotheses’ blog platform (<https://datacharter.hypotheses.org/>);
- The ‘OpenMethods’ platform, including highlights curated content about Digital Humanities methods and tools (<https://www.dariah.eu/activities/open-science/openmethods/>).

**The contents are provided in English (only).**

### 3. TRAINING AND CAPACITY BUILDING

The centre gives open access to several **online training resources** in a dedicated section (‘Training and education’/ ‘Activities’/header menu bar) managed through specific learning platforms. The link to the ‘HelpDesk’ form is provided. The Contents are provided in English (only).

- ‘DARIAH CAMPUS’: discovery framework and hosting platform for learning resources, including courses, Workshops, Games (asynchronous). Registration is not required.
- ‘DARIAH Teach’: platform for Open Educational Resources (OER), including Courses, Workshops, Games (asynchronous), Asynchronous training (e.g. Moodle); Static - video tutorial. Registration is required.
- ‘PARTHENOS’ Training: platform offers lectures and exercises, including Static - video tutorial; Course – online, Videos (asynchronous). Registration is not required.
- ‘DH Course Registry’: curated platform that provides an overview of the growing range of teaching activities in the field of digital humanities worldwide.

Other Training opportunities related to conferences, workshops, hackathons, and other events are presented and accessible from the ‘Events Calendar’.

### 4. SUPPORT IN INNOVATION AND PROJECTS

#### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre provides access to several **tools and repositories** from the official web site, organized in macro-categories.

‘News and events’ gives access to:

- ‘DHd-Blog’: a blog representing dh-research-communities of Germany, Austria and Switzerland in German language;
- ‘DARIAH at calenda.org – Events’: the Open Access online announcement service in the humanities and social sciences ‘Calenda’ aimed at informing students, lecturers and researchers alike of the current state of research. Contents are provided in multiple languages (English, Spanish, French, Portuguese).

‘Publishing’ gives access to several digital repositories:

- The ‘DARIAH-DE Working Papers’ (a link to the web site and a dedicated email are provided; contents are available in English and German);
- The ‘Hypotheses.org’ platform for humanities and social science research blogs (a link to the web site is provided);
- The ‘Doing Digital Humanities’ collaborative group library on Digital Humanities curated by DARIAH-DE members, containing several collections of bibliographic items relevant to specific

aspects of the Digital Humanities. The material is partly closed, internally accessible through Zotero;

- The ‘Open Archive HAL’ service, collecting scholarly documents from all academic fields (available in English and French).

‘Services’ and ‘Tools and Software’ give access to several data repositories, services and tools; software; platform and a search engines, web application, online collaborative tools; tool for metasearch on collections and resources, and many others.<sup>3</sup> For each service/tool a brief description, the main info, the link to the platform or to relevant documents, and contacts (in some cases) are provided.

Another service to be mentioned is a specific tool describing the complete list of activities and services developed by the partners/members (events, resource creation, software development, access to resources, data hosting, processing service, support service (‘Contributions’/‘Tools and Services’/ header menu bar).

#### 4.2. Collaborative research (Projects) and Networking

The centre operates **networking** in various ways: **participation in international projects, membership, and communication** of news and events promoted by other partners/members.

Benefits, opportunities and conditions of membership are clearly described in a dedicated section (Join DARIAH’/‘About us’/ header menu bar). The affiliation fees and terms are described in the centre statutes. Info about specific networking activities are presented in a dedicated section (‘Networking’/ header menu bar) including: members and partners (distinguished between Members, Observers and Cooperating partners) and regional hubs (western, eastern, central and Nordic): existing members functions as regional coordinators, bridging between the centre and the relevant institutions of the geographic area. A primary contact person for each hub is provided.

Thematic working groups – operating in a strategic area and complementary to individual contributions from the centre members - represent another collaborative research context of the centre. An overview of the active groups, completed by contact information and direct links to dedicated websites or resources are provided in a dedicated section (‘Working groups’/ ‘Activities’/header menu bar). Their activities are linked to specific services and/or tools provided by the centre (e.g., ‘DH Course Registry’, ‘#dariahTeach’ Learning platform, etc.)

The centre, in collaboration with its national nodes, participates in several strategic EU funded projects. The complete list of active and past projects is reported in a dedicated section (‘Projects’/‘Activities’/header menu bar). Info on the projects is provided in a dedicated section.

The centre defines a common bi-annual working theme, launching thematic funding calls reserved to partners, in order to promote activities and events. An overview of the themes proposed is described in a dedicated section (‘DARIAH Themes’/‘Activities’/header menu bar). The active call is fully presented in a dedicated linked website. Other initiative refers to the impact case studies (three case studies per year) produced by research communities, national consortia and individual researchers. The list of case studies is presented in a dedicated section (‘Impact case studies’/‘Activities’/header menu bar), redirecting to additional specific sections.

<sup>3</sup> <https://www.dariah.eu/tools-services/tools-and-services/>.



### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION		3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS								
	2.1 Contacts/Help	2.2. Communication	2.3. Dissemination	2.4. Orientation, Guidance and ...	4.1. Enablig Tech....	4.2. Collaborative..							
	About	Legal	News	Events	Social	Newsletter							
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>													
												Public and private heritage institutions responsible for managing monuments and sites	
												Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization	
												Professionals and SMEs providing services for preservation, conservation and restoration	
												Companies from the creative industry producing heritage-based content, apps, games, education and tourism services	
												Museums curators	
												Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional researchers	
												General and educational users and visitors, tourists	
												Others	
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>													
	<input checked="" type="radio"/>										<input checked="" type="radio"/>	<input checked="" type="radio"/>	Direct contacts (e-mail /Phone number)
	<input checked="" type="radio"/>												E-mail
											<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus Groups/taskforces/Thematic Departments
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus/Dedicated Pages
	<input checked="" type="radio"/>												General contact (Phone number)
					<input checked="" type="radio"/>								Specific software/tool
<input checked="" type="radio"/>	<input checked="" type="radio"/>					<input checked="" type="radio"/>			<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	Text Form



1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
		Newsletter									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Footer bar (Home page)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Dedicated section/page	
<input type="checkbox"/>			<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (internal): repository/ software /other web page	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page	
<b>ACCESS CONDITIONS</b> <i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>											
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration required	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration Not required/foreseen	
										Optional Registration (to access a pro-version)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Free	
									<input type="checkbox"/>	Under Fee	
									<input type="checkbox"/>	Consortium members / Fellows/ Collaborators	
<b>LANGUAGE</b> <i>In which language(s) are the services/content/resources provided?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	English (only)	
			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	Multiple languages, besides English	
			<input type="checkbox"/>							Language of the country of origin (only)	
<b>LINKS</b> <i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents	
<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Link to external pages or resources	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS	
2.1 Contacts/Help	2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
	About	Legal	News	Events	Social	Newsletter				
<b>LEVEL</b> <i>What is the level of services/resources?</i>										
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
						<input type="radio"/>				
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>										
							<input type="radio"/>			In presence
							<input type="radio"/>			Online/Distance
							<input type="radio"/>			Asynchronous distance learning
										Synchronous distance learning
										Real-time distance learning/Streaming
										Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>										
										5-15 minutes
							<input type="radio"/>			15-30 minutes
							<input type="radio"/>			1 – 2 Hours
										1 Days (4/6 hours)
										More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>										
										Yes
							<input type="radio"/>			No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4) the main users, to which the services and activities of the centre are addressed, are professional researchers.

**Supporting Tools/Structures:** Access to services is mainly managed from focus/dedicated sections. A text form is used to support contact for several services. Direct contacts are provided for specific services.

**Type of resources/contents:** Contents reported in dedicated sections of the official webpage represent the most used type of resource for multiple services. Other supporting resources refer to digital tools, services and datasets in the training and innovation areas. Workshops, webinars, events, conferences, and calls for applications are promoted through communication activities.

**Management:** Most of the services are managed by the official page, redirecting to dedicated sections. Contents and resources are made available both from internal and external repositories/platforms.

**Access conditions:** Most of the services are open access without registration. Access to specific services, technologies and training resources is available upon registration. Collaborative research (project involvement) is reserved to partners/members.

**Language:** Contents are mainly provided in English (only). Some services and tools are available in multiple languages, besides English, according to the geographic area of partners (national nodes).

**Links:** Access to information, resources and material is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The level of all services provided is professional.

**Delivery mode, timing and credits (training):** The centre provides mainly online/asynchronous training resources and modules of variable duration, without credits/certificate assignment. In presence activities refer to workshops, events or conferences.

## Abstract

**Category:** DOCUMENTATION CENTRES ON CH

**Sub-category:** Digital libraries and aggregators of digitised contributions

**Profile:** EUROPEANA is a non-profit organisation representing the main European Union's digital platform for cultural heritage working for the digital transformation of the cultural heritage sector.

**Mission:** EUROPEANA empowers the cultural heritage sector in its digital transformation. It aims to provide the full benefits of the technological revolution in digital services for culture, and develops expertise, tools and policies to embrace digital change and encourage partnerships that foster innovation. EUROPEANA makes it easier for people to use cultural heritage for education, research, creation and recreation. Its work contributes to an open, knowledgeable and creative society. EUROPEANA imagines a heritage sector powered by digital and a Europe powered by culture, giving it a resilient, growing economy, increased employment, improved well-being and a sense of European identity.

**Services:** EUROPEANA provides a portfolio of services covering: building digital capacity; education; online access to a vast store of cultural heritage material; impact playbook, inspiration, practical resources and a community to help develop and refine impact practice; research; international consortium providing standardised rights statements to the cultural heritage sector; webinars; tools, resources and inspiring examples.

**Audience:** EUROPEANA delivers networked cross-border services for citizens, teachers, professionals, businesses and public administrations.

**Legal and funds:** EUROPEANA is mainly funded by European Commission and Member States contributions. The annual business plan is public.<sup>4</sup>

**Main Sources:** Official webpage: <https://www.europeana.eu/en>; 4CH Deliverable D2.1 –[Report on CC](#) (pp. 134-137) on Zenodo.

## Highlights from the analysis of services

### 1. PRESENTATION OF SERVICES

The **description of services** and activities developed and delivered by the centre is provided in the official website (header toolbar menu). Specific info is provided in additional/thematic sections. The more general contents are provided in multiple languages, reflecting all European member states involved, while more detailed info is available in English (only).

The activities - and related services - are grouped per main categories describing main contents and users:

- 'Collections', gives access to the Europeana collection, allowing the resources browsing by themes (e.g., Archaeology, Art, Fashion, Industrial Heritage, etc.); topics (Violin concerto, Visual

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<sup>4</sup>[https://pro.europeana.eu/files/Europeana\\_Professional/Publications/europeana\\_foundation\\_business\\_plan\\_2023\\_budget.pdf](https://pro.europeana.eu/files/Europeana_Professional/Publications/europeana_foundation_business_plan_2023_budget.pdf).

arts, Western classical music, Woodworking, etc.); features (e.g., Colouring books, Making Culture, etc.); century (from 1st to 21st century); Galleries (e.g., Women at work, Open air and living history museums, Trading places; etc.); organisation; and recent items.

- ‘Stories’, gives access to CH stories in online exhibitions and blogs, created from European collections.
- ‘For professionals’, describes the opportunities provided for institutions and individuals in the CH sector and gives access to the ‘European pro’ web page and related services. The services are organised under 2 main categories (services and tools). Services are presented by topics (building digital capacity, copyright and digital cultural heritage, education, impacts, research, webinars, additional sections).
- ‘For teachers’, gives access to a selection of digital education resources for educators, students or interested people, defining the ‘Europeana Classroom’ service. The contents are grouped by highlights, learning scenarios (organised by methodology, cross-curricular subjects, languages, level of education, and other educational resources (including co-creation and participatory activities, digital learning handbook, the virtual learning environment ‘Historiana’, the MOOCs – massive open online courses platform).
- ‘Help’, gives access to help pages reporting a list of tips and instructions.

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact service** is managed from the official website within the ‘professional’ version of the centre (‘STAFF’/‘Contact us’/‘Europeana pro’/header toolbar menu). The complete list of staff members, including name and surname, role and job area (e.g., Content & Exhibitions Coordinator, collection engagement), direct contacts and other info (e.g., belonging/membership to the Europeana communities, country of origin, short CV, etc.) are provided. The centre offers support on three specific topics/activities from the ‘standard’ website (‘Help’/‘Europeana’/footer toolbar menu) in a dedicated section: how to search the collections, how to create and use a Europeana account, Reusability FAQ (this last section reports a direct info email address). The corresponding pages report full step-by-step instructions (also supported by videos and pictures). An additional support page, collecting several FAQs on the use of resources from the collection is available (‘FAQs’/‘Help’/‘Europeana’/footer toolbar menu).

### 2.2. Communication

The brief **general presentation** of the centre is provided in a dedicated section of the official website (‘About’/‘Europeana’/header toolbar menu). The aspects presented cover: mission, main services and an overview of the amount or resources made available via the Europeana Platform and the network of aggregation partners. A link to the website for professionals (‘Europeana Pro’) is provided. This ‘sister’ page provides additional and more detailed info about the mission (vision, work, departments, values, strategy, role in data space, brief history) and the Europeana foundation. The contents are provided in multiple languages in the main page and in English (only) in the professional one.

**Privacy policy, terms of use and the accessibility statement** are made available in a dedicated section ('Help'/'Europeana'/footer toolbar menu). Specific contacts (e-mail and responsible person) are provided. The contents are provided in multiple languages.

The **Communication** service is managed through several tools (News, Events, Social Media and Newsletter), respectively managed by the two web pages.

The **'News'** section ('News'/'Europeana pro'/home page) reports info on the latest news both across the initiatives involving the centre, both from the heritage sector. Each new is identified by a list of keywords, supporting a more rapid identification of contents. The reading time is also reported. From the general list, a link redirects to dedicated sections providing in-depth info and links to external pages or resources (if applicable). News related to specific projects or partners are also reported in an additional dedicated section ('News'/'Projects' and 'Partnerships'/'Europeana pro'/header toolbar menu). The contents are provided in English (only).

The **'Events'** section ('Events'/'Europeana pro'/header toolbar menu) provides info on differ types of events organized or promoted by the centre, including online and physical events. Each item is identified by a list of keywords, a brief abstract, speaker/s and some additional resources (e.g., slides, programs, etc.). For 'internal' events, the registration is managed through an external platform (Pretix.eu); for others, links to the official websites are available. Events related to specific projects are also reported in an additional dedicated section ('Events'/'Projects'/'Europeana pro'/header toolbar menu). A specific section is dedicated to past webinars, organized by topic (climate action, copyright, digital skills, education, engaging audience, impact, inclusive CH, research, sharing data, tech) and available from the YouTube channel of the centre. Another section is dedicated to the submission of open to all events, managed through a text form, based on an external app (app.smartsheet.com). The contents are provided in English (only).

Concerning **Social Media**, direct links to Facebook, Instagram, Pinterest and LinkedIn, are provided as icons ('Europeana'/footer toolbar menu). The centre has an official YouTube channel. The contents appear to be available in multiple languages for Facebook and in English (only) for the other platforms.

The **newsletter** is available upon registration (name, surname, email are required). The text form is available on the homepage ('Europeana'/ footer toolbar menu). The contents are provided in multiple languages.

### 2.3. Dissemination

The centre gives access to all its **strategic documents** (business plans, annual reports, white papers, frameworks and guides) from a dedicated section ('Publications'/'Europeana pro'/footer toolbar menu). All resources are listed in chronological order; report tags/keywords for identification; can be downloaded; and are described in curated sections.

**Other dissemination resources**, relating to participations in national and/or international projects are made available in the dedicated section ('Projects'/'Europeana pro'/header toolbar menu).

**Additional channels** for dissemination, describing the involvement of the centre in several activities, projects and initiatives, refer to the news and events section of the web page, contents published on social media and the YouTube channel (video, webinars, etc.). The contents are provided in English (only).



## 2.4. Orientation, Guidance and Consultancy

The exchange of knowledge, expertise and best practice on several main areas (climate action, communication, building digital capacity, copyright, tech, impact, education, research, etc.) is managed and provided by specific communities, task forces and working groups within the 'Europeana Network Association' (ENA). **Guidance and orientation** cover the same main topics, giving open access to guidelines, publications, focus pages, reports, news, toolkits, step-by-step guides, handbooks, webinars, tools and documents ('Services and Tools'/'Europeana pro'/header toolbar menu). **Specific guidance** is provided for developers interested in how the centre has built their services, sharing info and knowledge on procedures, apps, software, etc. ('Europeana'/footer menu bar) and on online events, providing a toolkit ('Events'/'Europeana pro'/header toolbar menu). The contents are provided in English (only). Other forms of consultancy are supposed to be performed within research projects activities.

## 3. TRAINING AND CAPACITY BUILDING

The centre develops several **training and educational activities** on several topics (climate action, communication, building digital capacity, copyright, tech, impact, education, research, etc.), providing open-access learning resources in multiple formats (static web/text contents, quiz (Google form), webinars, asynchronous training - e.g. Moodle, static video tutorial, etc.). The target user, aim, author, contents, guidelines, etc. are provided to support the exploitation and use of the resources. The contents are typically provided in English (only).

Videos, learning scenarios, games, lesson plans and tools (also for remote learning activities), for teachers, students, or interested persons in general, are available from a dedicated section ('For teachers'/'Europeana'/header toolbar menu). The learning scenarios are organized by methodology (e.g., STEM, PBL, IBSE, etc.), cross-curricular subjects, level of education (Primary, Secondary, Post-Secondary, VET & adult education), and other languages (Spanish, Portuguese, French, Italian, Greek, Polish). Other educational resources are described by co-creation and participatory activities, digital learning handbooks, access to the virtual learning environment/platforms 'Historiana', 'Learning with Europeana' and MOOCs (Massive Open Online Courses). The same contents, integrated with the complete offer of resources - including training online courses for teachers, webinars, contents from educational projects, etc. - are available from the 'pro' version of the official website ('Services and Tools'/'Europeana pro'/header toolbar menu). Additional training activities refer to seminars and conferences, presented in the 'Events' section.

## 4. SUPPORT IN AND PROJECTS

### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre gives open access to its **digital collections** from the official web ('Europeana'/home page): the registration is not required; the login allows some advanced options (e.g., save favourite items, create collections, etc.). Resources can be downloaded and re-used according to the specific attribution and copyright conditions. The contents are provided in multiple languages. Access to instructions and info (Benefits, Requirements, Technical criteria, Licence, Publish) on data share, through one of the domain and thematic aggregators from several European

countries, is available in a specific section of the 'pro' website (Share your data/Data Share/"Europeana pro"/header toolbar menu). The contents are provided in English (only).

A very large list of **digital tools** (e.g., software, platforms, datasets, guidelines, etc.) is available from the professional version of the web site ('Services and Tools"/"Europeana pro"/header toolbar menu). For each one a curated page describes the main aim, users, benefits, technical info, use, contacts, etc., providing direct links and instructions to access the services. The contents are typically provided in English, with some exceptions. The list of tools include: APIs for building applications from the Europeana collections (signup is required for download); the 'CrowdHeritage' platform, an online crowdsourcing platform for enriching the metadata of digitised cultural heritage material (signup is required); Culture Chabot, an AI-based software platform that creates virtual assistants (chatbots) especially designed for cultural heritage institutions (available upon request/contact); Curated datasets, grouping resources - newspapers, books, photos, art, artefacts, audio clips and more (registration not required); Dashboard (SHARE3D project), an online tool that allows users to share 3D models and their associated metadata for review and publication on the Europeana collections website (signup is required); 'Enhanced Unified Playout' Service, a universal audio-visual player offering a set of functionalities for reuse of AV cultural heritage content (signup is required); 'Europeana Essentials', a slide deck (power point) series covering a range of topics to support presentations about work from, or with, the Europeana Initiative (registration not required); 'Europeana Archaeology Vocabulary' Services, an online mapping tool for interlinking metadata terms with Linked Open Data resources; 'Europeana Subtitled AI pipeline and training suite', for creating subtitles and translation to audio-visual collections; 'Events Toolkit', providing guidance, tips and resources to run online and hybrid events around digital cultural heritage; 'Heritage Metadata Automatic Translation' system, a set of APIs for language detection and translation of text data fields submitted directly or via Open Archives initiative (OAI) feeds (available upon request/contact); 'Historiana', an online learning platform which supports the use of cultural heritage collections in education (signup is optional); 'LinBi Enrichment Platform', a platform which supports data enrichment by providing tools for linking, enriching and creating new objects following Europeana Data Model guidelines (signup is required); 'MotionNotes', a multimodal video annotator that facilitates the use of digital technologies in art and dance performances (signup is required); 'MovesCollect' and 'MovesScrapbook', two interconnected tools which offer new ways to interact with and use content on Europeana (browser plugin installation and registration are required); The 'Recommendation System', a system which recommends cultural heritage objects on the Europeana website to users based on their previous interactions (available upon request/contact); 'SAGE', a semantic enrichment and validation platform (available upon request/contact); 'Seven tips for digital storytelling', a resource to support telling engaging and inspiring stories with cultural heritage online; 'Storymaker' (SHARE3D project), a tool giving expert and non-expert users the opportunity to create stories with 3D content (signup is requested); 'Subbit!' Platform, an audio-visual editing platform which allows people to run crowd sourced campaigns to edit automatically generated subtitles (signup is not required); 'Subtitle-a-thon' platform, facilitating crowdsourcing initiatives which invite the public to create and add subtitles to archival audio-visual clips (signup is required); 'Transcribathon', an online citizen science initiative and a platform for the enrichment of digitised material from Europeana (signup is optional); 'User Galleries', a

tool that allows users to curate their own gallery on the Europeana website (creation of an account on the Europeana web site is required).

#### **4.2. Collaborative research (Projects) and Networking**

The centre, currently leading the deployment of the common European data space for cultural heritage<sup>5</sup>, participates in several EU funded projects to support cultural heritage institutions in their digital transformation, working on digitisation, aggregation of high-quality data, technological innovation, reuse and capacity building. The list of running and part projects is provided in a dedicated section of the professional web site ('Projects'/'About us'/Europeana pro/header toolbar menu). For each project a general description, main strands, related news and events, publication, partners, a contact person and the link to the official website are provided. Many of these projects have led to the creation of digital services, in addition to events, reports, training and educational resources.

Collaborative research is reserved to partners. The centre is open to proposals for collaboration from organisations, including non-profit, corporate and government, upon request (a direct contact person is available). The list of strategic, education and research partners is provided.

Another important collaboration area is the 'Europeana Aggregators Forum' (EAF), a network of national, regional, domain and thematic aggregators, sharing data with Europeana.

Another form of networking refers to the 'Europeana Network Association' (ENA): to join one or more of the different communities candidates have to fill in and send a form. A section dedicated to job vacancies is also available ('Careers'/Europeana pro/header toolbar menu).

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<sup>5</sup> <https://pro.europeana.eu/page/common-european-data-space-for-cultural-heritage>.

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION										3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication						2.3. Dissemination			2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
			About	Legal	News	Events	Social	Newsletter							
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>															
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Public and private heritage institutions responsible for managing monuments and sites		
													Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professionals and SMEs providing services for preservation, conservation and restoration		
													Companies from the creative industry producing heritage-based content, apps, games, education and tourism services		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Museums curators		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional researchers		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General and educational users and visitors, tourists		
													Others		
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>															
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Direct contacts (e-mail /Phone number)		
	<input type="checkbox"/>												E-mail		
													Focus Groups/taskforces/Thematic Departments		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Focus/Dedicated Pages		
													General contact (Phone number)		
				<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>		Specific software/tool		
							<input type="checkbox"/>						Text Form		



1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)	
			<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>				- Footer bar (Home page)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Dedicated section/page	
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Dedicated Platform (internal): repository/ software /other web page	
					<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		Dedicated Platform (external): repository/ software /other web page	
<b>ACCESS CONDITIONS</b>												
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>												
							<input type="checkbox"/>			<input type="checkbox"/>	Registration required	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration Not required/foreseen	
										<input type="checkbox"/>	Optional Registration (to access a pro-version)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Free	
											Under Fee	
											Consortium members / Fellows/ Collaborators	
<b>LANGUAGE</b>												
<i>In which language(s) are the services/content/resources provided?</i>												
<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	English (only)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	Multiple languages, besides English	
											Language of the country of origin (only)	
<b>LINKS</b>												
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS		
2.1 Contacts/Help	2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..	
	About	Legal	News	Events	Social	Newsletter						
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Link to external pages or resources
<b>LEVEL</b> <i>What is the level of services/resources?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>												
	<input type="radio"/>								<input type="radio"/>			In presence
	<input type="radio"/>								<input type="radio"/>			Online/Distance
	<input type="radio"/>								<input type="radio"/>			Asynchronous distance learning
	<input type="radio"/>								<input type="radio"/>			Synchronous distance learning
	<input type="radio"/>								<input type="radio"/>			Real-time distance learning/Streaming
	<input type="radio"/>								<input type="radio"/>			Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>												
	<input type="radio"/>								<input type="radio"/>			5-15 minutes
	<input type="radio"/>								<input type="radio"/>			15-30 minutes
	<input type="radio"/>								<input type="radio"/>			1 – 2 Hours
	<input type="radio"/>								<input type="radio"/>			1 Days (4/6 hours)
	<input type="radio"/>								<input type="radio"/>			More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>												
	<input type="radio"/>								<input type="radio"/>			Yes
	<input type="radio"/>								<input type="radio"/>			No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), all services provided by the centre - except for collaborative research - are directed at all categories (Public and private heritage institutions., Professionals and SMEs..., Museums curators, Associations, NGOs and local communities, Professional researchers, General and educational users...).

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections. Direct/specific email contacts are provided for most of the services. Subscription/application is managed in some cases with the support of a text form or online platforms/apps.

**Type of resources/contents:** The contents are directly provided in the several sections of the official webpage: web contents, images from the centre's collections, pdf documents and videos, represent the most commonly used type of resource for all services. Specific digital repositories/platforms support the access to training services and digital collections.

**Management:** The official webpage is the main point of access to services, redirecting to dedicated sections or to specific online platforms and repositories (both internal and external).

**Access conditions:** All services provided are available free of charge and without registration. Access to specific online tools or data sharing requires registration or direct contacts with responsible partners. Collaborative research is reserved to partner institutions.

**Language:** The more general contents - presentation of the centre and access to digital collections - are provided in several languages. The 'professional' contents and resources are available in English (only).

**Links:** Access to information and resources is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The services provided cover both professional (dissemination, training, events) and non-professional use (educational services).

**Delivery mode, timing and credits (only training):** The centre provides several training and educational programs, activities and initiatives, covering many delivery modes (in person, asynchronous, synchronous and blended). The average timing is equally varied (from 15-30 minutes to 1-2 hours). Certificates of attendance and/or training credits are not foreseen for the activities offered.



## Connecting Archaeology and Architecture in Europe (CARARE)



### Abstract

**Category:** DOCUMENTATION CENTRES ON CH

**Sub-category:** Expert-hubs of digital cultural heritage valorisation networks

**Profile:** CARARE is a non-profit membership association with a consortium of 27 full members (agencies and organisations, research institutions, specialist digital archives and others) and 3 supporters (ministries, NGOs, government organisations, university departments, research institutions, museums, private companies and individuals) with an interest in the archaeological and architectural heritage. The CARARE member network includes: national heritage agencies from several countries (Denmark, Malta, Poland, Czech Republic, the Netherlands, Brussels, Slovenia, Slovakia, Iceland); archives (ADS, DANS, the German Archaeological Institute, Bulgarian Academy of Science); universities (Vilnius and Jaen); specialists (The Discovery Programme, Visual Dimension).

**Mission:** CARARE aims to advance professional practice and foster appreciation of the digital archaeological and architectural heritage through the promotion for public benefit of digitisation, connection, enhancement, and use of digital content nationally and internationally. It supports the creation, connection, enhancement and use of digital archaeological and architectural heritage resources, for work, research, learning and for enjoyment.

**Services:** CARARE provides advice, guidance and training on good practices in the creation, publication and use of digital data; technical services to enable institutions around Europe to share their digital content with users via Europeana and the CARARE channel; maintains the CARARE metadata schema; delivers training, workshops, webinars and an annual conference; disseminates news and information to its members and followers (communications); works to foster appreciation of the digital cultural heritage and its potential uses by the wider community. CARARE 'Pro' (professional) provides access to tools and materials developed to support the creation, connection, enhancement and use of digital archaeological and architectural heritage resources.

**Audience:** Professionals, researchers, curators, creative industries and university start-ups focussing on 3D, students, citizen scientists.

**Legal and funds:** CARARE is a membership association with membership and projects income.

**Main Sources:** Official webpage: <https://www.carare.eu/en/about/>; 4CH Deliverable D2.1 – [Report on CC](#) (pp. 169-171) on Zenodo.

### Highlights from the analysis of services

#### 1. PRESENTATION OF SERVICES

The **description/presentation** of services is managed from the official website ('About'/CARARE pro'/header toolbar menu). Services are grouped under macro-categories, as follows:

- 'Introduction to CARARE aggregation services': Guidelines and step-by-step instructions.

- ‘Services & Guidelines’: Documentation, guidelines and links to the tools (+ user guide), which make up the CARARE aggregation service; Repository; Digital services (e.g., The Europeana Archaeology Vocabulary Service) and dashboards (+ user guide) (e.g., SHARE3D).
- ‘Training Hub’: Training resources organised under topics.
- ‘Resources’: Dissemination materials, Publication and Reports, Video Presentations, Project Legacy, Contents highlights in Europeana through CARARE.
- ‘Projects’: brief presentation of the projects in which the centre is/was involved and the direct link to the official web pages.
- ‘Webinars’
- ‘Newsletter’: mailing list subscription through a text form.

The services purpose and end users are described. The contents are provided in English (only), with the exception of the general presentation of the centre, which is available in multiple languages (Italian, Greek, French, Dutch).

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact service** is managed from the official website (‘About’/‘Contact us’/header toolbar menu or ‘Contact us’/ footer toolbar menu) in a dedicated section through a text form to be filled in (name, email and message are required). A direct email address is not provided.

A **help/support** section (step by step guide) is provided for the data aggregation service. The contents are provided in English (only).

### 2.2. Communication

The centre provides a **general presentation** in a dedicated section of the official web page (‘About’/header toolbar menu), including general info about mission, focus, membership, etc.

The same page is used to present (and give access) to the portfolio of services and give the instructions to get in touch with the centre. The contents are provided in multiple languages (Greek, Italian, English, French, Spanish, Nederland).

**Legal and privacy policies** are described in a dedicated section (‘Legal’/ footer toolbar menu). A specific email is provided. The contents are provided in English (only).

**Communication** is managed through four main tools and entrusted to a specific operational area (News, Events, Social Media, Newsletter). Each section is directly accessible from the home page (or from the header toolbar menu). Registration is not required. The contents, including both internal (curated and developed by the centre) and external activities (direct links to partners’ pages), are provided in English (only), and follow a coordinated graphic image.

The **‘News’** section includes focus pages, articles, best practices and case studies, blogs, news about conferences and webinars, calls for application and job opportunities, online publications and journals. Info, reported under a coordinated graphic image, covers both internal external contents.

The **‘Events’** section, organised under ‘upcoming’ and ‘past’ events, gives access to a calendar of webinars, conferences, forums, etc. presented through a brief description. For internal events, the direct link for registration (which directs to a dedicated platform - Eventbrite) is provided; for

external events, a link redirects to the official websites. The 'past' events section represents a useful memory database on CH events.

The centre has an account on the Twitter **social media** platform: a direct link is available in the home page (header toolbar menu).

The '**Newsletter**' service is accessible under the signup of a simple text form including email, name and surname, affiliation and preferred format (html or text). Info is monthly sent and refers to updates on the centre, news, calls and events, publications and jobs. The contents are provided in English (only).

### 2.3. Dissemination

The centre gives open access to **dissemination resources** (registration not required) from a dedicated section ('Resources'/'CARARE pro'/'About'/header toolbar menu). The resources include different formats, are available in English (only), can be downloaded and are organized under main categories: Dissemination materials, accessible from a dedicated platform (presentations on 'Slideshare'; videos on 'Vimeo'); Reports (accessible from an internal repository) and Publications list (open access); Public Deliverables (PU) resulting from projects involvement (accessible from 'Zenodo' platform); Annual Contents highlights in EUROPEANA through CARARE (preview accessible from a dedicated page + external link to Europeana).

### 2.4. Orientation, Guidance and Consultancy

The centre provides specific **support** on data sharing, through a step-by-step guide (registration is not required) in a dedicated page, accessible from the service list ('Introduction to CARARE aggregation services'/'CARARE pro'/'About'/header toolbar menu). The data aggregation service is reserved to members (under fee). A link for direct contacts through a text form is provided in the introductory section. The contents are provided in English (only).

## 3. TRAINING AND CAPACITY BUILDING

The centre promotes and gives open access (registration is not required) to **training resources** in a dedicated section of the official web page ('Training Hub'/'CARARE pro'/'About'/header toolbar menu). Materials are organised by topics (3D and Virtual reality, Content management systems and repositories, Metadata and vocabularies, Working with CARARE services, Copyright, access permissions and FAIR principles). The contents are provided in English (only). The resources, presented through a brief description including end users, refer to: Documents (e.g., presentations from webinars, workshops, etc.) accessible from an internal repository; Guidelines on tools/software and procedures, accessible from an internal repository; Tutorials, accessible from an internal repository; Videos, accessible from a dedicated platform (YouTube); Webinars, accessible from a dedicated platform (Vimeo); other contents (Presentations), accessible from a dedicated platform (Slideshare). Webinars, conferences, and forums represent other training activities, organised or promoted by the centre (See The 'Communication' section).

## 4. SUPPORT IN INNOVATION AND PROJECTS

### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre gives access or provides links to specific **tools and datasets** from different dedicated sections of the official web page ('Services & Guidelines' and 'Projects'/'CARARE pro'/'About'/header toolbar menu). The contents are provided in English (only).

The enabling technologies and datasets include:

- Documentation, guidelines and links to the tools (+ user guide), which make up the CARARE aggregation service. Info is accessible from the web site and external links are available.
- CARARE repository (for data storage registration is required and is reserved to members).
- Digital services (e.g., The 'Europeana Archaeology Vocabulary Service'). Registration is required.
- Digital dashboard (+ user guide) (e.g., SHARE3D). Registration is required.
- Specific tools/application/collections developed within projects (e.g., ARIADNEplus portal, Europeana Digital Service Infrastructure, Europeana's Archaeology thematic collection, LoCloud collection; MORE Repository, etc.). General info about the resources, end-users and links to external web pages or platforms are provided. For access to tools, registration is required.
- CARARE collection ('Explore'/'Explore the Collections'/header toolbar menu). Registration is not required for browsing resources using a text form for search. Info is accessible from the website. The external links to the data providers are available.

### 4.2. Collaborative research (Projects) and Networking

The centre operates **networking** through participation in international projects, membership, and communication of news and events promoted by other affiliated institutions/organisations on coherent topics. The centre is involved in several research projects described with a short paragraph ('Projects'/'CARARE pro'/'About'/header toolbar menu). Direct links to the official pages are included. A specific section is dedicated to a project (LoCloud) for which the access to a greater number of resources is provided, including: deliverables, presentations and a suite of specific services/applications and the repository developed within the project activities. The contents are made available through specific platforms (e.g., Zenodo.org for documents; Slideshare.net for presentations). Participation in project activities is reserved to members. The affiliation mechanisms are described in a dedicated section ('Join us'/header toolbar menu). A text form is provided to send the affiliation request. The contents are provided in multiple languages besides English (Greek, Italian, English, French, Spanish, Dutch).

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and ...	4.1. Enabling Tech....	4.2. Collaborative..
	2.1.1	2.1.2										
	About	Legal	News	Events	Social	Newsletter						
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Public and private heritage institutions responsible for managing monuments and sites	
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professionals and SMEs providing services for preservation, conservation and restoration	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Companies from the creative industry producing heritage-based content, apps, games, education and tourism services	
											Museums curators	
											Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional researchers	
											General and educational users and visitors, tourists	
											Others	
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>												
		<input type="radio"/>									Direct contacts (e-mail /Phone number)	
											E-mail	
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					Focus Groups/taskforces/Thematic Departments	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Focus/Dedicated Pages	
											General contact (Phone number)	
											Specific software/tool	
<input type="radio"/>	<input type="radio"/>					<input type="radio"/>		<input type="radio"/>			Text Form	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
	About	Legal	News	Events	Social	Newsletter					
<b>TYPE OF RESOURCES/CONTENTS</b>											
<i>What are the types of content, activities and resources through which the services are provided?</i>											
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Best practices and Case studies	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				Blogs	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				Calls/ application (scholarship, Job opportunities, etc.)	
						<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Digital Collections/Resources/Datasets	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		Events/ Conferences/Lectures/Seminars	
<input type="checkbox"/>										Contents from official web page	
										Courses	
										FAQs	
						<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Guidelines	
<input type="checkbox"/>						<input type="checkbox"/>		<input type="checkbox"/>		Presentations (slides)	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Projects participation/deliverables/results/apps	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				Publications (Articles, Books, Journals)	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Reports	
								<input type="checkbox"/>	<input type="checkbox"/>	Technologies (app, tools, services)	
							<input type="checkbox"/>	<input type="checkbox"/>		Toolkits/Handbooks/Step by step guide	
<input type="checkbox"/>						<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Videos	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		Webinars	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		Workshops	
										Other	
<b>MANAGEMENT</b>											
<i>How is access to services managed? What is the primary and/or secondary access point?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Official Web page	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)	
		<input type="checkbox"/>								- Footer bar (Home page)	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter					
<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	- Dedicated section/page	
<input type="radio"/>							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dedicated Platform (internal): repository/ software /other web page	
<input type="radio"/>							<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	Dedicated Platform (external): repository/ software /other web page	
<b>ACCESS CONDITIONS</b> <i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>												
							<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	Registration required
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				Registration Not required/foreseen
												Optional Registration (to access a pro-version)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Free
												Under Fee
									<input type="radio"/>	<input type="radio"/>		Consortium members / Fellows/ Collaborators
<b>LANGUAGE</b> <i>In which language(s) are the services/content/resources provided?</i>												
	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	English (only)
<input type="radio"/>		<input type="radio"/>										Multiple languages, besides English
												Language of the country of origin (only)
<b>LINKS</b> <i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Internal contents
<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Link to external pages or resources
<b>LEVEL</b> <i>What is the level of services/resources?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
					<input type="radio"/>							Non professional

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
	About	Legal	News	Events	Social	Newsletter					
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>											
										In presence	
								<input checked="" type="radio"/>		Online/Distance	
								<input checked="" type="radio"/>		Asynchronous distance learning	
										Synchronous distance learning	
								<input checked="" type="radio"/>		Real-time distance learning/Streaming	
										Blended	
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>											
										5-15 minutes	
								<input checked="" type="radio"/>		15-30 minutes	
								<input checked="" type="radio"/>		1 – 2 Hours	
										1 Days (4/6 hours)	
										More Days	
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>											
										Yes	
								<input checked="" type="radio"/>		No	



### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), all the services provided by the centre are directed to: public and private heritage institutions responsible for managing monuments and sites; professionals and SMEs providing services for preservation, conservation and restoration; companies from the creative industry producing heritage-based content, apps, games, education and tourism services; and professional researchers.

**Supporting Tools/Structures:** Access to services is mainly managed from focus/dedicated sections. A text form is provided to get in touch with the centre. Access to specific contents is managed through software/tools. A specific service (communication) is curated by a taskforce.

**Type of resources/contents:** In addition to contents directly reported in the official webpage, sharing best practices and case studies, guidelines, project results, video, workshops and webinars represent the supporting type of resources and contents most used for dissemination, communication and training.

**Management:** The official webpage, redirecting to dedicated sections, handles most of the services provided. Contents and resources are made available both from internal and external repositories/platforms.

**Access conditions:** Access to specific services (Collaborative research/project involvement and specific technologies) is reserved to members who pay a membership fee. Access to the 'learning hub' does not require registration and is available free of charge.

**Language:** Some information at the general level is available in multiple languages (presentation of services, 'About us', 'Join us' sections). Main contents are provided in English.

**Links:** Access to information, resources and material is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The level of all services provided is professional. Social Media could represent a channel accessible to a wider audience.

**Delivery mode, timing and credits (training):** The training modules/activities directly provided by the centre are mainly online, asynchronous and real-time distance learning with an average duration of 1 hour and a half. Certificates of attendance are available for some activities.

## The Archaeology Data Service (ADS)



### Abstract

**Category:** DOCUMENTATION CENTRES ON CH

**Sub-category:** Databases, digital inventories and repositories

**Profile:** The ADS is a not-for-profit organisation hosted by the University of York (charitable status information), the only accredited digital repository in the UK for heritage data, with over 20 years of experience supporting research, learning and teaching with free, high quality and dependable digital resources.

**Mission:** The ADS is the leading accredited digital repository for heritage data generated by UK-based fieldwork and research. Its core activity is the long-term digital preservation of the data entrusted to their care. To do this it follows a policy of active data management and curation. All resources archived with the ADS are Open Access and are delivered through their website to facilitate reuse by the heritage sector and wider community. The ADS promotes good practice in the use of digital data in archaeology, providing technical advice to the research community and taking the lead in a wide range of research projects. The ADS works within International e-infrastructure collaborations such as ARIADNE to explore new ways of connecting archives around the world, creating a genuinely global network for communication that cuts across traditional research boundaries.

**Services:** The ADS portfolio of services covers: collections - ingestion of data to archive; data management; digital preservation - policies, repository operations, etc.; systems development, applications; access - FAIR, rights management; teaching and learning; training; guides to good practice; research.

**Audience:** UK archaeologists (researchers, archaeological units, local archaeology societies); UK heritage organisations (public institutions, NGOs, non-profit institutions); universities; students; people interested in the archaeology of the UK; International research institutions, researchers, students, interested public.

**Legal and funds:** The ADS is financed through a mixed funding model comprising three strands: research and development project grants, consultancy income, core infrastructure funding from UK Research and Innovation, primarily via Arts and Humanities Research Council (AHRC) and Natural Environment Research Council (NERC), data deposit charges.<sup>6</sup>

**Main Sources:** Official webpage: <https://archaeologydataservice.ac.uk/>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 153-155) on Zenodo.

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<sup>6</sup> <https://archaeologydataservice.ac.uk/about/policies/charging-policy/>.

## Highlights from the analysis of services

### 1. PRESENTATION OF SERVICES

The **presentation of services** and activities provided by the centre is managed from the official website. Contents are provided in English (only). An overview of services and opportunities is presented under macro categories (accreditations, presentations, publications, collaborations, projects, etc.). For each item a brief description and a link to a dedicated section are provided ('About'/header toolbar menu). The main services are listed by audience/users - archaeological researchers and teachers; data creators and depositors; funding bodies and other agencies. Direct links to the dedicated sections or tools are provided ('The organisation'/'About'/header toolbar menu). Other info, for instance on teaching resources, is available in a different section ('Help & Guidance'/header toolbar menu). The 'Search data' service - allowing open access to project collections, reports, publications and metadata records - and the 'Deposit data' service are available with a direct access (header toolbar menu).

### 2. CONSULTANCY AND ORIENTATION

#### 2.1. Contacts/Help

The **Contact and Help/Support** sections are managed from the official website. Contents are provided in English (only). Different email addresses for contacts are available in relation to the reason of inquiry in a dedicated section/page: general enquiries; technical support on ADS-easy platform; costing or info on depositing data. Specific instructions on inquiries and info on the physical address of the centre are provided in the dedicated section ('Contact'/footer toolbar menu). Support is provided on different services (ADS-easy-platform and other tools, grant applications, opportunities for professional development, a glossary, teaching resources, and other guidelines, case studies, FAQs): for each topic a brief description is provided and a link to a dedicated page ('Help & Guidance'/header toolbar menu). In particular, the 'FAQs' section is organised under five main boxes (Using the ADS, Depositing data, Registration, Technical support, Registration, ADS Library). For each box a list of linkable main questions and the links to the full list of frequent inquiries are displayed. Selecting an item the system redirects to a dedicated page reporting instructions and examples. A direct link to the 'Contacts' page is also provided.

#### 2.2. Communication

The centre provides a **general presentation** in a dedicated page of the official web page including several sections, with respect to which three main aspects are highlighted with a different colour (the organisation, governance, policies and procedures). Other contents of the page refer to services and activities, and the presentation of the staff, in particular role and bio ('About'/header toolbar menu).

**Privacy policy** is described in a dedicated section ('Support'/footer toolbar menu). Other policies and procedures (access and reuse, collections, depositor charging, infrastructures, metadata, repository, rights, preservation, etc.) are described in detail in another dedicated section ('About'/header toolbar menu). An index, redirecting to specific pages is provided. The operational and related documents can be downloaded.

**Communication** service is managed through four main tools (News, Events, Social Media, Newsletter) from the official web site.

The **'News'** section presents updates on several topics, tools, activities, and projects. For each item a picture, a brief description and the centre involvement are highlighted; a link redirect to a dedicated page. The section includes only internal contents (curated and developed by the centre). The recent highlights are presented in the home page ('News & Events'/header toolbar menu).

The **'Events'** section gives access to a calendar of seminars, conferences, etc. (both internal and external). For each item a picture, a brief description and the centre involvement are highlighted, a link redirects to a dedicated page. Details and links for registration are provided, also using external platforms (e.g., Eventbrite). The section includes both internal (curated and developed by the centre) and external contents (direct links to external pages). The recent highlights are presented in the home page ('News & Events'/ header toolbar menu).

The centre has an official account on LinkedIn and on several **social media** platforms (Twitter, Facebook, Instagram). Direct links are provided from the home page (footer toolbar menu).

The subscription to the quarterly **e-newsletter** is managed through a text form reporting name and email, accessible from the home page (footer toolbar menu).

An **extra channel for communication** in which the centre participates is a Blog (header toolbar menu). The recent highlights are presented directly in the home page.

The contents are provided in English (only).

### 2.3. Dissemination

A list of all publications produced by ADS staff, and other dissemination resources and activities (Annual Reports, Blog and Newsletter) are described in a dedicated section ('ADS publication'/'About'/header toolbar menu). Access to resources is managed through an internal repository (ADS Library) collecting bibliographic records and Open Access copies of published and unpublished documents relating to archaeology and heritage. Presentations and other resources from the ADS participation in workshops and conferences are accessible from a dedicated section and organised by year ('ADS presentations'/'About'/header toolbar menu). A chart and a map show the total outreach undertaken by ADS staff. The centre, alongside its base at the Department of Archaeology at the University of York, publishes an international, open access journal for archaeology – 'The Internet Archaeology Journal'<sup>7</sup> ('About'/header toolbar menu). As a related activity, the centre manages the 'Open Access Archaeology Fund'<sup>8</sup> with the specific aim of supporting the publishing and archiving costs of researchers who have no means of institutional support. All the Info and the link to the initiative website is provided. The 'News' and 'Collaborations' sections represent other important channels for dissemination, describing the involvement of the centre in several activities, projects and initiatives ('News and Events'/header toolbar menu). The contents are provided in English (only).

### 2.4. Orientation, Guidance and Consultancy

The **orientation/guidance** service is managed in dedicated sections of the official web page ('About' and 'Help & Guidance'/header toolbar menu) providing guidelines on multiple topics

<sup>7</sup> The Internet Archaeology Journal, <https://archaeologydataservice.ac.uk/about/the-internet-archaeology-journal/>.

<sup>8</sup> The Open Access Archaeology Fund: <https://archaeologydataservice.ac.uk/about/the-open-access-fund/>, <https://yustart.hubbub.net/p/OpenAccessFund/>.

through several supporting instruments, as listed below. Specific needs are addressed through direct contacts. The contents are provided in English (only).

- Open access to info protocols and tools about the evaluation of digital preservation infrastructure and workflows through self-assessment, audit and certification. Links to the specific web page are reported in the dedicated section ('Accreditation'/'About'/header toolbar menu).
- Guidelines, instructions and terms for depositing data in the centre repository ('Deposit Data' /header toolbar menu). A specific team (ADS Collections Team) manages the service. A direct email contact is provided.
- Advice on request on several grant schemes: UK Research and Innovation Councils – Arts and Humanities Research Council (AHRC), Natural Environment research Council (NERC); Other higher education funding bodies – British Academy, Leverhulme Trust; European Commission funding – European Research Council (ERC) funding, Horizon Europe; National Lottery Heritage Lottery (NLHF); Governmental agencies – Historic England or Local government; Marc Fitch Fund. Links to info on the specific grants are provided and some guidelines are available from the centre website ('Advice for grant applicants'/'Help & Guidance'/header toolbar menu).
- Support on request for uploading procedures of data to a specific platform – 'Heritage Gateway' ('Advice for HER uploads to the Heritage Gateway'/'Help & Guidance'/ header toolbar menu). Links to the specific web page, info and a direct email contact are provided. The loading to the platform is under fee payment.
- Open access to reviewed existing guidelines and new documents on several topics: digital archiving, the project lifecycle, basic components, data collection and fieldwork, data analysis and visualisation, case studies, preparing and depositing your archive ('Guides to Good Practice'/'Help & Guidance'/header toolbar menu). Contents and resources are provided directly in the web page, including links to external resources.

### 3. TRAINING AND CAPACITY BUILDING

The centre gives access to **online training resources** and **opportunities for professional development** in a dedicated section of the website ('Help & Guidance'/header toolbar menu). The contents are provided in English (only). The 'Opportunities for professional development' section gives access to info and resources developed with various partners, tailored to suit different sectors of the archaeology profession (including commercial contractors, consultancies, local government archaeological officers, museum curators, Historic Environment Records officers, community archaeology, academic research and undergraduate and postgraduate teaching). Specific contacts are provided. The centre offers, in particular: undergraduate/postgraduate, and doctoral research teaching programmes (available upon request); examples of teaching programmes and learning materials are provided; workshops; courses developed with various partners, tailored and under request on several topics. The list of past events and resources are available. The centre supports research, learning and teaching providing digital resources. In addition to the archival material hosted by the centre, resources specifically designed to provide teaching and learning tools for both students and educators in the primary and secondary education, as well as the higher education context ('DataTrain'), are available. Learning resources - including videos, documents, texts, videos, tutorials, etc. - are organised by target user (primary/

secondary education) and by topic. Specific contacts are provided. Other training opportunities related to conferences, seminars, workshops and other events are presented in the dedicated section ('News & Events'/'Events'/header toolbar menu).

#### **4. SUPPORT IN INNOVATION AND PROJECTS**

##### **4.1. Enabling technologies, datasets access/sharing, physical equipment**

The centre manages the access to three main repositories from a dedicated section of the webpage ('Search data'/ header toolbar menu). For browsing the resources registration is not required, resources are open access. The main repositories refer to: 'ArchSearch' (an integrated online catalogue indexing metadata records, including ADS collections and metadata harvested from UK historic environment inventories); 'Archives' (collection of project data); 'Library' (bibliographic records, reports and journal articles). The service of data deposit to the centre repository ('ADS-EASY') is described in a dedicated section ('Deposit data'/header toolbar menu) addressing specific issues (Instructions, description of the platform, Costing calculator, instructions for the type of dataset allowed, reason for depositing). The service is available upon request and under fee payment. A specific email is provided for costing or information on depositing data ('Contact'/footer toolbar menu). The contents are provided in English (only).

##### **4.2. Collaborative research (Projects) and Networking**

The centre operates networking through several channels. The centre evaluates opportunities for collaboration within specific projects. Benefits of involving the centre as a partner are highlighted in a dedicated section ('Collaborate with us'/'About'/header toolbar menu). The link to the contact page and the list of projects (in which the centre is currently and has been involved in the past) are provided. Partnerships of the centre are described in a dedicated section ('Partnerships'/'About'/header toolbar menu) including: the list of partners, the specific terms of collaborations (mandated archive status, recommended trusted digital repository for digital data generated from projects, advisory for providing guidance for funding applications and project-based digital preservation), link to their official web pages, and other documents (e.g., specific guidelines or standards elaborated by the centre). The list of on-going and completed projects in which the centre is involved is reported in a dedicated section ('Projects'/'About'/header toolbar menu). A web page includes a series of boxes informing the title of the project, status (on-going/completed), a brief abstract, and a link to a dedicated section describing more detailed info, the centre role and a link to the project official web page.

## Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Public and private heritage institutions responsible for managing monuments and sites
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professionals and SMEs providing services for preservation, conservation and restoration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Companies from the creative industry producing heritage-based content, apps, games, education and tourism services
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Museums curators
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional researchers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General and educational users and visitors, tourists
											Others
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>											
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct contacts (e-mail /Phone number)
<input type="checkbox"/>	<input type="checkbox"/>							<input type="checkbox"/>			E-mail
							<input type="checkbox"/>				Focus Groups/taskforces/Thematic Departments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Focus/Dedicated Pages
											General contact (Phone number)
					<input type="checkbox"/>			<input type="checkbox"/>			Specific software/tool
					<input type="checkbox"/>						Text Form

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>TYPE OF RESOURCES/CONTENTS</b>											
<i>What are the types of content, activities and resources through which the services are provided?</i>											
				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		Best practices and Case studies	
				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		Blogs	
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Calls/ application (scholarship, Job opportunities, etc.)	
				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Digital Collections/Resources/Datasets	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Events/ Conferences/Lectures/Seminars	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Contents from the official web page	
								<input checked="" type="checkbox"/>		Courses	
	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		FAQs	
	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Guidelines	
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Presentations (slides)	
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Projects participation/deliverables/results/apps	
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Publications (Articles, Books, Journals)	
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Reports	
				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		Technologies (app, tools, services)	
				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		Toolkits/Handbooks/Step by step guide	
						<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Videos	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		Webinars	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		Workshops	
	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		Other (Glossary)	
<b>MANAGEMENT</b>											
<i>How is access to services managed? What is the primary and/or secondary access point?</i>											
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Official Web page	



1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....		4.2. Collaborative..
		About	Legal	News	Events	Social						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- Header bar (Home page)	
			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				- Footer bar (Home page)	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- Dedicated section/page	
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Dedicated Platform (internal): repository/ software /other web page	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Dedicated Platform (external): repository/ software /other web page	
<b>ACCESS CONDITIONS</b>												
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>												
						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration required	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration Not required/foreseen	
											Optional Registration (to access a pro-version)	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Free	
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Under Fee	
											Consortium members / Fellows/ Collaborators	
<b>LANGUAGE</b>												
<i>In which language(s) are the services/content/resources provided?</i>												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	English (only)	
											Multiple languages, besides English	
											Language of the country of origin (only)	
<b>LINKS</b>												
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Internal contents	
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Link to external pages or resources	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS	
2.1 Contacts/Help	2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
	About	Legal	News	Events	Social	Newsletter				
<b>LEVEL</b> <i>What is the level of services/resources?</i>										
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
					<input type="radio"/>					Non professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>										
							<input type="radio"/>			In presence
							<input type="radio"/>			Online/Distance
							<input type="radio"/>			Asynchronous distance learning
										Synchronous distance learning
										Real-time distance learning/Streaming
										Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>										
										5-15 minutes
							<input type="radio"/>			15-30 minutes
							<input type="radio"/>			1 – 2 Hours
							<input type="radio"/>			1 Days (4/6 hours)
							<input type="radio"/>			More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>										
							<input type="radio"/>			Yes
							<input type="radio"/>			No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), the services provided by the centre are directed to: public and private heritage institutions responsible for managing monuments and sites; professionals and SMEs providing services for preservation, conservation and restoration; companies from the creative industry producing heritage-based content, apps, games, education and tourism services; associations, NGOs and local communities aiming at maintaining and communicating cultural heritage; museums curators; professional researchers; general and educational users and visitors, tourists. Among these, specific categories can be considered as primarily end-users of the resources and activities disseminated and promoted by the centre (e.g., museum curators, general and educational users, associations).

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections. Direct email contacts are provided for specific services (technical support, data deposit). Advice and data deposit services are in charge of special working teams.

**Type of resources/contents:** In addition to contents directly reported in the official webpage, several types of resources support the services provision. Guidelines, publications and reports represent the most used ones. Specific tools and digital repositories support the access to services related to the innovation and technology area.

**Management:** The official webpage, redirecting to dedicated sections from the home page, mainly manages the services provided. Resources are made available both from internal and external repositories/platforms.

**Access conditions:** Most services (access to learning and dissemination resources, guidance) do not require registration and are available free of charge. Access to specific/advanced level services (data deposit, advice, training, collaborative research) is provided upon request and/or for a fee.

**Language:** The contents are provided in English (only).

**Links:** Access to information and resources is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The level of all services provided is professional. Social Media could represent a channel accessible to a wider audience.

**Delivery mode, timing and credits (training):** The centre provides both online and in presence training activities on request of variable duration (from 1-2 hours to period of training), and provides online training materials. For specific courses, upon request and fee payment, credits/certificate of attendance are assigned.

## Central Institute for the Union Catalogue of Italian libraries and for bibliographic information (ICCU)



### Abstract

**Category:** DOCUMENTATION CENTRES ON CH

**Sub-category:** Databases, digital inventories and repositories

**Profile:** ICCU is the Italian national public institute responsible for library services, cataloguing and management of the Union Catalogue of Italian libraries and of other databases.

**Mission:** ICCU is responsible for cataloguing the entire national bibliographic heritage, improving the knowledge of bibliographic collections as well as simplifying user access.

**Services:** ICCU is responsible for the promotion and coordination of the cataloguing of the book heritage held in public libraries through the National Library Service (SBN). It coordinates projects for the cataloguing, digitisation and long-term preservation of digital documents. It produces, translates and disseminates national guidelines and international standards for the cataloguing of several types of materials. It provides training and help for cataloguing through online resources, courses and internships.

**Audience:** Library community and citizens.

**Legal and funds:** ICCU is a public body funded with national (Italian) income. The budget documents are public and published in a specific section of the website ('transparent administration', according to the Italian legislation).<sup>9</sup>

**Main sources:** 4CH Deliverable D2.1 – [Report on CC](#) (pp. 150-152) on Zenodo, Official webpage: <https://www.iccu.sbn.it/en/>.

### Highlights from the analysis of services

#### 1. PRESENTATION OF SERVICES

The **description of services** and activities developed and delivered by the centre is provided in the official website, in a dedicated section ('Activities'/header toolbar menu). Specific info is provided in additional/thematic pages. The contents are provided in Italian (standard option) and English. The main categories of services refer to:

- Responsibility, at institutional level, for promotion and coordination of the cataloguing and documentation of the book heritage held in public libraries, with particular reference to the realisation of the 'National Library Service' (SBN) - network of Italian libraries promoted by the Ministry of Cultural Heritage and Activities and Tourism, with the cooperation of regional administrations and universities.
- Draft, production and dissemination of guidelines and standards for the cataloguing of relevant materials, from manuscripts to multimedia documents.

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<sup>9</sup> <https://www.iccu.sbn.it/it/footer/amministrazione-trasparente/bilanci/index.html>.

- Coordination of and participation in projects and programmes concerning cataloguing, digitisation and long-term preservation of digital documents created thanks to modern information technology, at national and international level.
- Promotion and coordination of a national census of manuscripts, of the 16th century Italian editions and the Italian libraries database, in order to improve knowledge on bibliographic collections and make them easier to access.
- Access to a series of online services (home page) and to the databases of the Digital ecosystem of the national bibliographic services.
- Production (and dissemination) of documents, reports and publications.
- Dissemination of news and events.
- Study/Research and advanced training activities in the thematic areas of competence of the Institute (cataloguing regulations, international standards and technological innovation in the library sector), internship activities and educational visits aimed at undergraduate and postgraduate students, information events such as congresses, seminars and study days.

The different activities are entrusted to specific Working groups, Committee, Study groups and Commissions ('Working groups and Commissions'/Activities'/header toolbar menu) and Activity Areas ('The institute'/header toolbar menu). Each area is described in a dedicated section, providing the reference direct contact. Groups, organised under active and concluded, are described providing case-by-case information (actions, publications, roster, contacts, outputs, guidelines, etc.).

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact** service is managed from the official website, providing both info at general level - institutional e-mail, address and phone numbers (footer toolbar menu) – both direct phone numbers and emails ('Institute staff'/'The Institute'/header toolbar menu). Specific contact and/or info on responsible persons are provided for each competence area or working groups ('Areas...'/ 'The Institute'; 'Working...'/ 'Activities'/header toolbar menu). A specific help/support service is not foreseen. The contents are provided in multiple languages: Italian (standard option) and English.

### 2.2. Communication

The **general presentation** of the institute/centre is provided in a dedicated section of the official website ('The Institute'/header toolbar menu). The aspects presented cover history, aim, mission and focus, functions, areas of activities, reference law regulations. A brief video (available on the YouTube channel) supports the text description, available only for the Italian language version. It is possible to download the official logo. The contents are provided in Italian (standard option) and English. Only for the Italian version, a list of agreements, decree-laws, memoranda of understanding, legislative conventions, etc. concerning the centre are made available in a dedicated section.

**Privacy policies** are described in an external page of the Italian Ministry of Culture. The contents appear to be provided in Italian (only). Terms of use for contents and resources available on the

web page are described in a dedicated section (footer toolbar menu). The contents are provided in multiple languages, Italian (standard option) and English.

The **Communication** service is entrusted to a specific area (Communication and Cultural Promotion Service, Communication office and Cultural Promotion office) and managed through three main tools (News, Social Media, Newsletter).

The **Events and News** section (home page) reports info on and make available different types of resources (press releases, newsletters, presentation, updated on the working groups activities, events, conferences). The section includes only internal (curated and developed by the centre) contents. A search engine allows you to search for resources by year, month or by keywords/text. From the list, a link redirects to dedicated sections providing in-depth info and links to external pages or resources (if applicable). The contents appear to be provided in Italian (only).

Concerning **Social Media**, direct links to the Facebook and Twitter accounts, and to the YouTube channel of the centre are provided (footer toolbar menu). The contents appear to be available in Italian (only).

The contents from the monthly **newsletter**, publishing news about activities, conferences, study days, etc. is managed through an external platform (mailchimp.com), accessible from the 'Events and News' section (home page). Registration is optional to directly receive the contents on your personal email address. The registration is managed through a text form (e-mail, name, and surname, preferred format - html or text are required). The contents appear to be available in Italian (only).

### 2.3. Dissemination

**A list of publications** curated by the centre is available in a dedicated section of the official website ('Publication'/header toolbar menu). Info on how to proceed with the order and purchase are provided (Italian, only). For further info a dedicated email is provided. The list of publications include: proceedings of congresses, special bibliographies, collective catalogues, catalogue of Italian libraries, series The conservation of digital, Series Contributions and proposals, Digitization series, Research and tools, Cataloguing manuals, ICCU Periodicals, Various publications, Directories and catalogues of periodicals. For each item the full list of available resources and prices are reported in a dedicated section/page. An additional section, available for the Italian version (only) describes some special offers. The contents are provided in Italian (only).

**Other dissemination resources**, relating to participation in national and/or international projects are available from the dedicated section ('Activities'/'National' or 'International activities'/header toolbar menu). The contents are provided in multiple languages, depending on the project. Some outputs (publications, guidelines, etc.) from the working groups activities are available in the dedicated section ('Working groups and Commissions'/Activities'/header toolbar menu). If accessible, resources are available in Italian (only), referring to documents or contents published in other web pages (e.g., Wikipedia). The contents are provided in Italian (only).

**Additional channels for dissemination**, describing the involvement of the centre in several activities, projects and initiatives, refer to the news section of the web page, contents published on social media and the YouTube channel (video, webinars, etc.). The contents are provided in Italian (only).

## 2.4. Orientation, Guidance and Consultancy

The centre offers **orientation and guidance** on procedures of cataloguing and documentation of the book heritage held in public libraries, with particular reference to the realisation of the 'National Library Service' (SBN) and the 'Interlibrary loan and document delivery' (ILL SBN), also drafting and disseminating guidelines and standards. These main areas of expertise are addressed in a specific dedicated section of the website, providing full and detailed info on all the related procedures and standards. The type of resources mainly refers to texts directly reported on the web page, integrated by links to external resources. Concerning cataloguing rules, the centre gives open access to guidance resources including: Italian, SBN and international standards and rules, Metadata and Digitisation Guidelines. The resources are made available from internal repositories, external platforms (MediaWiki), and/or other web pages. The contents are provided in Italian (only) and for international standards and guides the Italian version (translation) is made accessible. Other manuals and resources on Open Data are available from a different dedicated section (Activities'/'Open Data'/header toolbar menu).

## 3. TRAINING AND CAPACITY BUILDING

The centre develops and provides **training activities and courses** in its sector of expertise (e.g., catalographic rules, international standards and technological innovation in the library sector). The topics covered include: traditional cataloguing, with particular reference to the rules and standards that the Institute drafts as part of its institutional charges, SBN Catalographic rules, Automated SBN procedures, Characteristics and functions of the ILL-SBN service, Guidelines on metadata digitisation and standards (MAG), Scientific and research activities carried out by the Institute, Standards and instruments within the framework of European projects. The training courses are organised upon request for libraries, institutions and other bodies, tailored on their specific needs: topic, level and number of participants have to be communicated to the centre director. The courses - held by experts from the centre, external librarians working in national libraries, university professors and other accredited subjects - can be delivered with the support of physic and equipped spaces/halls of the centre. Info is available in a dedicated section of the official web (no information on the costs of accessing the training programs was found), listing all the active and ended courses, special projects and specific training on the SBN Web application. The list, available only for the Italian website option, gives access to the annual training and professional update plan/catalogue (on the website is currently available only the plan for 2019). Info on dates, topics, application modalities (special forms are available) and courses programme are described. Direct contacts are provided. The training courses which foreseen the release of a certificate of attendance are mainly in person/face-to-face activities or blended, thus divided into face-to-face modules organised in several locations located throughout the country, supplemented by remote modules (FAD), accessible through an e-Learning platform.

**Other training activities** refer to internships or educational visits for undergraduate and graduate students in the fields of the library sector. Also in this case, applications have to be addressed to the centre Director, evaluated and accepted according to the educational requests and the availability of the staff. Furthermore, the centre organises and promotes information events (e.g., conventions, seminars and study days) focusing on professional development and on the

dissemination of the Institute research activities. The contents are provided in Italian (standard option) and English (reduced info).

#### 4. SUPPORT IN INNOVATION AND PROJECTS

##### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre provides access to **several online services** (tools and datasets) from the homepage of the official website. For each service, the title and a brief description are provided: a link directly redirects to the specific platform. A specific working area manages the service. The contents are provided in multiple languages: Italian (standard option) and English, except for some specific services, available in Italian (only). The main services refer to:

- ‘Alphabeta’ is an advanced bibliographic portal, which retrieves news and materials through an integrated search system that connects different databases (OPAC SBN, Manus Online, EDIT16, SBN Teca, Digitised Historical Catalogues, 14-18 - Documents and images of the Great War and MOVIO - Online Virtual Exhibitions), all managed and coordinated by the ICCU. The portal has been designed to communicate with external databases. The portal can be browsed through a simple search tool, the results of the query being sorted and shown in different boxes, each one referred to a thematic area (Protagonists, Music, Books, Manuscripts, Audios and Videos, Cartography, Periodicals, Graphic, Libraries) or a material type. Several dashboards manage the data visualisations. General info, support on browsing modalities and contacts are provided. The service is open access and registration (through text form) is optional, allowing access to a personal area.
- ‘OPAC SBN’ is the On-line Public Access Catalog SBN system allowing bibliographic searches in the collective catalogue of the Italian libraries participating in the National Library Service (SBN). General info, browsing modalities and contacts are provided. The service is open access and registration (through text form) is optional, allowing access to a personal area.
- ‘EDIT 1’ is a database describing the national census of sixteenth-century Italian editions and aims at surveying the Italian printed production of the sixteenth century. General info, support on browsing modalities and contacts are provided. The service is open access and registration (through text form) is optional, allowing access to a personal area.
- ‘Manus online’ is a database containing catalogue descriptions and digital images of manuscripts, private papers and archives held by Italian public, private and ecclesiastical libraries. General info, support on browsing modalities and contacts are provided. The service is open access and registration (through text form) is optional, allowing access to a personal area.
- ‘The Register of Italian libraries’ is a database giving access to the list of public and private libraries present in the Italian territory (name, address, info on opening hours, etc.) and redirects to the specific webpage of each library. The portal can be browsed through a simple search tool (region, province, free text). The service is open access, registration is not required, and is available in the language of the country of origin of the centre (Italian).
- ‘Internet Culturale’ is a portal giving access to catalogues and digital collections from Italian Libraries including several types of resources (manuscripts, books, musical scores, maps, images, sound recordings, newspapers, music, magazines, etc.). General info, support on browsing modalities and contacts are provided. The service is open access, registration is not required, and is available only in the language of the country of origin of the centre (Italian).



- 'ILL SBN' is the Interlibrary loan and document delivery service: it is free access, registration is required and is available only in the language of the country of origin of the centre (Italian).
- 'Digitised Historical Catalogues' is a collection of digitised historical volumes and card catalogues of Italian libraries. The service is open access, registration is not required, and is available only in the language of the country of origin of the centre (Italian).
- '14-18' is a portal giving access to a digital collection of documents and images (photos, press, manuscripts, graphics, relics, monuments and tombstones, periodical, sound recordings) of World War I. The service is open access, registration is not required, and is available only in the language of the country of origin of the centre (Italian).
- 'Cultura Italia' is a portal gathering, organising and giving a targeted access to a database of metadata which gathers and organises the information on the Italian culture resources arriving from all the providers participating in the project. The service is open access, registration is not required, and is available in multiple languages (Italian and English).
- 'OPIB' (Observatory of International Library Programs) is a web site dedicated to the documentation of the main European and international programs (of which the related calls for funding are periodically reported) and also containing a selection of on-going European projects relating to libraries and cultural institutions. The targeted users are the Italian cultural institutions: archives, libraries, museums, universities, and public administration. The service is open access, registration is not required, and is available only in the language of the country of origin of the centre (Italian).

#### **4.2. Collaborative research (Projects) and Networking**

The centre participates in several national and international projects and programs, which describe the collaboration with as many institutions. Many of these projects have led to the definition of online services, tools, guidelines, etc. The complete list of on-going and concluded projects is provided in two specific sections, national and international ('National activities'/'International activities'/'Activities'/header menu bar). Each project is described in a dedicated section, providing links to external resources and direct contacts. The direct involvement and participation is reserved for the centre staff. The contents are provided in Italian (standard option) and English (reduced info).

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and ...	4.1. Enablig Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>											
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Public and private heritage institutions responsible for managing monuments and sites
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
											Professionals and SMEs providing services for preservation, conservation and restoration
											Companies from the creative industry producing heritage-based content, apps, games, education and tourism services
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Museums curators
											Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional researchers
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	General and educational users and visitors, tourists
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Others (Library community)
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>											
	<input checked="" type="radio"/>								<input checked="" type="radio"/>	<input checked="" type="radio"/>	Direct contacts (e-mail /Phone number)
	<input checked="" type="radio"/>		<input checked="" type="radio"/>								E-mail
	<input checked="" type="radio"/>			<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>			<input checked="" type="radio"/>	Focus Groups/taskforces/Thematic Departments
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus/Dedicated Pages
	<input checked="" type="radio"/>										General contact (Phone number)
											Specific software/tool
						<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>			Text Form

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
	2.1.1	2.1.2	About	Legal	News	Events	Social					
<b>TYPE OF RESOURCES/CONTENTS</b> <i>What are the types of content, activities and resources through which the services are provided?</i>												
					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Best practices and Case studies	
											Blogs	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	Calls/ application (scholarship, Job opportunities, etc.)	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Digital Collections/Resources/Datasets	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Events/ Conferences/Lectures/Seminars	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Contents from the official web page	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Courses	
											FAQs	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Guidelines	
								<input checked="" type="checkbox"/>			Presentations (slides)	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	Projects participation/deliverables/results/apps	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	Publications (Articles, Books, Journals)	
		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Reports	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	Technologies (app, tools, services)	
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Toolkits/Handbooks/Step by step guide	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Videos	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Webinars	
				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Workshops	
											Other	
<b>MANAGEMENT</b> <i>How is access to services managed? What is the primary and/or secondary access point?</i>												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Official Web page	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION		3. TRAINING AND CAPACITY BUILDING							4. SUPPORT IN INNOVATION AND PROJECTS	
	2.1 Contacts/Help	2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Footer bar (Home page)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Dedicated section/page
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (internal): repository/ software /other web page
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page
<b>ACCESS CONDITIONS</b>											
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration required
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration Not required/foreseen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional Registration (to access a pro-version)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Free
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Under Fee
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consortium members / Fellows/ Collaborators
<b>LANGUAGE</b>											
<i>In which language(s) are the services/content/resources provided?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	English (only)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Multiple languages, besides English
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Language of the country of origin (only)
<b>LINKS</b>											
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Link to external pages or resources

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
2.1 Contacts/Help	2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
About	Legal	News	Events	Social	Newsletter					
<b>LEVEL</b> <i>What is the level of services/resources?</i>										
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
<input type="radio"/>		<input type="radio"/>			<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	Not professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>										
						<input type="radio"/>				In presence
										Online/Distance
						<input type="radio"/>				Asynchronous distance learning
										Synchronous distance learning
										Real-time distance learning/Streaming
						<input type="radio"/>				Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>										
										5-15 minutes
										15-30 minutes
										1 – 2 Hours
						<input type="radio"/>				1 Days (4/6 hours)
						<input type="radio"/>				More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>										
						<input type="radio"/>				Yes
										No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), all services provided by the centre are directed to a specific user category represented by the library community. Other categories involved are: public and private heritage institutions responsible for managing monuments and sites; museum curators; professional researchers; general and educational users and visitors, tourists.

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections. Direct email contacts are provided for specific services (technical support, training, project involvement). Subscription is managed in some cases with the support of a text form. Specific services (Communication and Online services) are in charge of dedicated working areas.

**Type of resources/contents:** In addition to contents directly reported in the several sections of the official webpage, different types of resources support the services provision. Guidelines, toolkits, publications and reports represent the most used ones. Specific tools and digital repositories/platforms give access to services related to the innovation and technology area. Info on calls, events, seminars, etc. are provided through the communication channels.

**Management:** The official webpage is the main point of access to services, redirecting to dedicated sections or to specific online platforms and repositories (both internal and external), managing the resources available.

**Access conditions:** All the online services are free of charge, most of them do not require registration. Access to specific services (training courses and collaborative research) is available upon request and reserved to official partner institutions, or staff from the public libraries community.

**Language:** The contents - in particular the presentation of the services and the main activities - are provided in two languages: Italian (standard option) and English. Many services (news, events, newsletters, orientation, training and most online services) are available only in Italian (language of the centre country of origin).

**Links:** Access to information and resources is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The services provided cover both professional (orientation, training, events) and non-professional use (particularly some online services). Social Media could represent a channel accessible to both audiences.

**Delivery mode, timing and credits (only training):** The centre mainly delivers long-term face-to-face or blended programs (several days spread over a quarter or semester), exceptions are extraordinary activities such as education visits or internships. The training courses or programs are activated by the centre or provided upon request by public bodies/institutions. Information on any costs for participants is not available. Certificates of attendance and/or training credits are usually assigned.

## **Abstract**

**Category:** OTHER NATIONAL AND INTERNATIONAL CENTRES ON CH

**Sub-category:** National public institutes operating in CH restoration, conservation, and promotion field

**Profile:** The Conservation and Restoration Centre ‘La Venaria Reale’ is a Foundation for higher education and research in the field of cultural heritage conservation.

**Mission:** The CCR works to promote Education and Research on CH conservation following three strategic axes: innovation, internationalisation and culture to be developed with a digital transformation process. It offers advanced levels training and capacity building programs promoting the development of the territory through knowledge transfer to the local cultural heritage enterprises, by means of an interdisciplinary approach and cross-sectorial projects and collaborations at local, national and international level.

**Services:** The CCR provides several services addressing a wide target of users. The CCR, within the agreement with the University of Turin for the Master Course in ‘Conservation and Restoration of Cultural Heritage’ has the responsibility in relation to the conservation work done on the works of arts (SAF - Higher Education School sector- is in charge for the collection and definition of works of arts, object of the students dissertation work, technical supervision of the experimental conservation work and research activities). The CCR provides on demand training courses and schools (summer and winter schools), at regional, national or international level, in presence or on-line mode; workshop and congress organisation for external trainees, students and professionals. The CCR works in partnership with Intuitions for technical, scientific, methodological support for the development of research projects, didactical activities, conservation activities, scientific analysis. The centre has the possibility to validate new materials, new equipment and new methodologies on a large range of artefacts and works of arts (conservation sectors: stone materials, stuccoes, mural paintings, easel paintings, wooden paintings and sculpture, wooden materials and furniture, archaeological finds, metals, ceramics, glass, modern and contemporary art, textiles and tapestries, paper and photographic support, leather, ethnographic materials). The CCR develops diagnostic analysis for third parties.

**Audience:** Public Institutions, research centres, companies (SME), start-ups, universities, research organisation

**Legal and funds: Main Sources:** The CCR is a non-profit Foundation based on private law with a public-law shareholding, which adopts the rules of public law. CCR is co-funded by banking and private foundations, incomes from service provisions, Public funding (EU and local projects), research projects. The Economic Budget is available on the webpage.<sup>10</sup>

**Main sources:** Official webpage: <https://www.centrorestaurovenaria.it/en>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 177-180) on Zenodo.

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<sup>10</sup> <https://www.centrorestaurovenaria.it/en/node/48>.

## Highlights from the analysis of services

### 1. PRESENTATION OF SERVICE

The **description of services** and activities developed and delivered by the centre is provided in the official website (header toolbar menu). Specific info is provided in additional/thematic sections. The contents are provided in multiple languages: Italian (standard option), English, French and Chinese (zh-Hans - Simplified, People's Republic of China). The activities - and related services - are grouped per main categories.

- ‘Conservation and restoration’, gives access to info on:
  - the Conservation Laboratories in charge of project and studies for CH conservation, monitor and maintenance. The labs apply the research into the various restoration methods and materials, and gain information used in educational and training courses to university students, restoration professionals and the wider public. The results achieved are presented at conferences and workshops, and made available through specialist publications (e.g., ‘Cronache’ series). Detailed info on the specific labs, including staff members and highlights on recent works, is provided in dedicated sections;
  - the Scientific Laboratories - equipped with state-of-the-art technological instrumentations - work on various areas (participation in national and international research projects, monitoring and diagnostics – also carrying out services for third party activities). Detailed info, including staff members, is provided in a dedicated section;
  - the Preventive Conservation Programs (carried out in collaboration with several partners institutions) aimed at developing operative protocols for analysing the state of conservation of the collections kept at historic residences (museums), and conducting specific training courses in this area.

Conservation and Scientific Laboratories correspond to specific Departments.

- ‘Research and Innovation’, describes the main research projects and activities (conservation history and restoration history, restoration techniques, materials and the application and development of innovative diagnostic and conservation techniques, individual restoration works) at national and international level, which involve the all departments of the CCR. Studies and research projects are also subjects of in-depth analysis in the university courses and degree theses. Info on on-going and past projects is provided. The section includes additional info on the annual forum addressed to students and young professionals of cultural heritage and related disciplines, promoted by partnership with other institutions.
- ‘Training’, includes specific info on different training programmes (Advanced Training and Degree course) and access to the digital learning platform of the centre. Advanced Training and Study School is one of the main Departments of the centre.
- ‘Educational Services’, provides info on informative educational projects (teaching itineraries, visits, educational proposals available on the learning platform, other educational services) developed for schools, young people, adults, professionals and people with disabilities. The service is in charge of a specific Department.
- ‘Documentation’, includes access to info on the library of the centre, archive collections, printed and digital publications.
- ‘Seminars and Events’, gives access to a calendar of events promoted and curated by the centre (e.g., guided tours, activities, news, etc.).



- ‘Communication’, gives access to several resources and info on specific activities (annual reports, news on conferences and events, publications, curated press releases and press conferences).

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **Contact service** is managed from the official website. The institutional email addresses, phone numbers, and address of the physical headquarter are available in the homepage (footer toolbar menu). Detailed info on how to reach the centre (hosted inside the historical site of the Royal Palace la Venaria) is provided in a dedicated section (‘How to reach’/Contacts’/header toolbar menu). Additional email contacts are available for specific services in the dedicated sections (e.g., advanced training, educational services, archives, services for third party activities, info/reservations/contacts of the library, etc.). The CCR Digital Lab (dedicated platform of advanced training on digital heritage, accessible from the ‘Training’ section of the CCR website) provides a contact channel through a text form (name/surname, email, department of interest - education, training, technical support - and message are required) and a whatsapp phone number for direct contacts (‘Contact us’/footer toolbar menu). The contents are provided in multiple languages: Italian (Standard option), English, French, Zh-hans.

### 2.2. Communication

The **general presentation** of the centre is provided in a dedicated section of the official website (‘The Centro’/header toolbar menu). The aspects presented cover: centre foundation and location, main departments (Conservation Labs, Scientific Labs, Advanced Training and Study School (SAF), Educational Services, Programming and Development, Technical Services and Administration); organisation chart and staff members; regulations. The contents are provided in multiple languages - Italian (standard option), English, French and zh-Hans - with the exception of regulatory documents (available only in Italian).

**Privacy policies** and related documents (e.g., open data and data reuse) are made available in a dedicated section (‘The Centro’/‘Amministrazione Trasparente’/toolbar menu). Specific contacts (e-mail, phone numbers, and responsible person) are provided. The contents appear to be provided in Italian (only).

The **Communication** service is managed through several tools (News, Seminars and Events, Press Release and Conferences, Social Media and Newsletter).

The **News** section (‘Communication’/header toolbar menu) reports info on several kind of activities: the working groups updates, events, exhibitions, job opportunities, teaching programmes, workshops, courses, etc. redirecting to an additional section for application and/or registration. Other instruments (Google text forms, documents, links to external web pages, etc.) support the contents delivery. Some events are free, others require registration, and others are paid. The section includes both internal (curated and developed by the centre) and external (partners) contents. A search engine (free text) allows users browsing resources. From the general list, a link redirects to dedicated sections providing in-depth info and links to external pages or resources (if applicable). The general description is provided in multiple languages: Italian (standard option), English, French and zh-Hans - with the exception of programmes and other

documents (available only in Italian). The full list of press releases by the centre and press conferences by newspapers and websites are available as curated documents and organised in chronological and/or thematic order in two dedicated sections ('Communication' / header toolbar menu).

The '**Seminars and Events**' section (header toolbar menu) manages and presents only internal events (museums guided visits, conferences, lectures, exhibitions, etc.). Visits typically require buying a ticket. The contents seem to be available according to the official language of the event (e.g., selecting the English language option appears only a short selection of events).

Concerning **Social Media**, direct links to Facebook, Instagram and LinkedIn, and to the YouTube channel of the centre are provided as icons (homepage). The contents appear to be available in Italian (only).

The **newsletter** is available upon registration (only the email is required). The text form is available on the homepage. The contents appear to be available in Italian (only).

### 2.3. Dissemination

A list of **publications and digital documents** curated by the centre is available from two dedicated sections of the official web page ('Publication' and 'Digital editions'/'Documentation'/header toolbar menu). Some documents are available in full text; for others, only the cover, colophon and index are available. The list refers to: books, numbers from the 'Cronache' series curated by the centre, congresses proceedings, annual reports, etc. The pdf documents – in Italian language (only) - can be downloaded from an internal repository and/or from a dedicated platform ([www.sfofliami.it](http://www.sfofliami.it)). The annual reports of the centre activities – including the past ones - are accessible also from the 'Communication' section (header toolbar menu).

In terms of **access to physical structures**, the centre has its own library and archives. The library is specialised in the history of art and restoration techniques, archaeology, design, diagnostics, art criticism and museology, with particular focus on the local artistic context (resources are available via 'OPAC' (online public access library service) and 'Librinlinea' regional (Piedmont) platform. Info on address, timetables, responsible staff, and email contact for reservations are provided. The archives, accessible upon reservation/request, concerned with contemporary art and the history of restoration. Info on address, responsible staff, and email contact for reservations are provided.

**Other dissemination resources**, relating to participation in national and/or international projects are available from the dedicated section ('Research and Innovation'/Activities'/'National' or 'International activities'/header toolbar menu). The general contents are provided in multiple languages, while resources depend on the specific project. Additional channels for dissemination, describing the involvement of the centre in several activities, projects and initiatives, refer to the news and events section of the web page, contents published on social media and the YouTube channel (video, webinars, etc.). The contents seem to be available according to the official language of the event.

### 2.4. Orientation, Guidance and Consultancy

The centre carries out diagnostic services for third party activities through its Scientific Laboratories. Info equipment/technologies, methodologies and techniques are provided in a dedicated section ('Scientific Laboratories'/Conservation and Restoration'/ header toolbar menu).

The service is available for a fee and upon request (a dedicated email is provided for info and cost estimates). Discounts are available for graduates of the master's degree course up to two years from the date of conferment of the degree. The contents are provided in Italian (only).

### 3. TRAINING AND CAPACITY BUILDING

The centre develops and provides **several training programmes and educational services** in the Conservation and Restoration of Cultural Heritage area:

- Advanced Training/ High formation (Courses, Masters, Internships) in collaboration with the University of Turin: access is by application, fee payment, learning credits are provided.
- Five-year Master's Degree course in collaboration with the University of Turin, including additional training opportunities (e.g., Summer School): access is by application, fee payment;
- Courses (online and in person), webinars and workshops (live streaming, online, blended, in presence): access is by registration, fee payment, certificate of attendance provided. For some courses access is reserved to staff involved in specific projects.
- Experiences for schools and educational contexts (e.g., visits, courses, workshops, etc.): access is by registration, both free and fee payment, average timing between 2 hours, 6-9 hours split in more modules.

The info and related focus pages/contents on advanced training and degree courses are available from dedicated sections of the official website ('Training'/header toolbar menu). Other training and educational activities (for schools, adults and families) are managed and described through a dedicated learning platform (CCR Digital Lab), used for info provision, contacts, FAQs, registration and purchase. The course descriptions are available but training materials are not provided (with the exception of some documents, available upon registration on the platform). The contents are provided in multiple languages: Italian (standard option) and English. Courses are supposed to be in Italian (only). Furthermore, the centre organises and promotes seminars and conferences, presented in the 'Seminars and events' section. The contents seem to be available according to the official language of the event.

### 4. SUPPORT IN INNOVATION AND PROJECTS

#### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre gives online **access to digital collections** from its archives (e.g., Fondo Martano) from a dedicated section of the official website ('Archives'/ 'Documentation'/header toolbar menu): the registration is not required. The contents are provided in Italian (only).

Info on the library collection (books and periodicals) is available from the SBN (National Library Service), via OPAC (Online Public Access) and another regional platform (Librinlinea).

The centre makes **available for rent some spaces** equipped for events and activities. Characteristics, equipment of the spaces, and an email contact are described in a dedicated section ('Location rental'/home page). The contents are provided in multiple languages: Italian (standard option) and English.

Applied research in the field of CH preventive conservation and restoration is one of the main activities conducted by the centre through its Scientific and Conservation laboratories. Access to the laboratories is reserved to internal staff or students on degree and advanced training courses.

#### **4.2. Collaborative research (Projects) and Networking**

The centre participates in several national and international projects and programs in collaboration with public and private institutions. Many of these projects have led to the publication of books and training contents. The complete list of on-going and concluded projects is provided both in the section dedicated to the presentation of Laboratories activities and the 'Research and Innovation' one. Highlights, project description and links to dedicated web pages and sections are provided. The contents are provided in Italian (standard option) and English (reduced info).

Among the research and networking activities promoted by the centre there is the annual 'Young professional forum': an international event aimed at increasing skills, bringing together professionals in the cultural heritage sector and opening up to a wider and more diverse audience. Info on programme, registration, fees, etc. are provided in a dedicated section. Other networking activities refer to other events (seminars, conferences, etc.).

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Public and private heritage institutions responsible for managing monuments and sites	
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professionals and SMEs providing services for preservation, conservation and restoration	
											Companies from the creative industry producing heritage-based content, apps, games, education and tourism services	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Museums curators	
											Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional researchers	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General and educational users and visitors, tourists	
											Others	
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>												
	<input type="checkbox"/>							<input type="checkbox"/>		<input type="checkbox"/>	Direct contacts (e-mail /Phone number)	
	<input type="checkbox"/>							<input type="checkbox"/>	<input type="checkbox"/>		E-mail	
											Focus Groups/taskforces/Thematic Departments	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Focus/Dedicated Pages	
	<input type="checkbox"/>									<input type="checkbox"/>	General contact (Phone number)	
				<input type="checkbox"/>							Specific software/tool	
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>					Text Form	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help		2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
	About	Legal	News	Events	Social	Newletter					
<b>TYPE OF RESOURCES/CONTENTS</b> <i>What are the types of content, activities and resources through which the services are provided?</i>											
				<input type="radio"/>					<input type="radio"/>	Best practices and Case studies	
				<input type="radio"/>						Blogs	
				<input type="radio"/>			<input type="radio"/>			Calls/ application (scholarship, Job opportunities, etc.)	
				<input type="radio"/>					<input type="radio"/>	Digital Collections/Resources/Datasets	
				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Events/ Conferences/Lectures/Seminars	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Contents from the official web page	
				<input type="radio"/>	<input type="radio"/>				<input type="radio"/>	Courses	
								<input type="radio"/>		FAQs	
										Guidelines	
										Presentations (slides)	
				<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	Projects participation/deliverables/results/apps	
				<input type="radio"/>			<input type="radio"/>		<input type="radio"/>	Publications (Articles, Books, Journals)	
				<input type="radio"/>			<input type="radio"/>			Reports	
										Technologies (app, tools, services)	
										Toolkits/Handbooks/Step by step guide	
								<input type="radio"/>		Videos	
				<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	Webinars	
				<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	Workshops	
									<input type="radio"/>	Other (physical spaces for rental)	
<b>MANAGEMENT</b> <i>How is access to services managed? What is the primary and/or secondary access point?</i>											
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Official Web page	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS				
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)		
	<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>				- Footer bar (Home page)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Dedicated section/page		
							<input type="checkbox"/>		<input type="checkbox"/>		Dedicated Platform (internal): repository/ software /other web page		
					<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		Dedicated Platform (external): repository/ software /other web page		
<b>ACCESS CONDITIONS</b>													
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>													
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration required		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	Registration Not required/foreseen		
											Optional Registration (to access a pro-version)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Free		
				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Under Fee		
								<input type="checkbox"/>		<input type="checkbox"/>	Consortium members / Fellows/ Collaborators		
<b>LANGUAGE</b>													
<i>In which language(s) are the services/content/resources provided?</i>													
											English (only)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Multiple languages, besides English		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Language of the country of origin (only)		
<b>LINKS</b>													
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>													
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents		
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Link to external pages or resources		

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS		
2.1 Contacts/Help	2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..	
About	Legal	News	Events	Social	Newsletter							
<b>LEVEL</b> <i>What is the level of services/resources?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	In presence
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Online/Distance
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Asynchronous distance learning
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Synchronous distance learning
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Real-time distance learning/Streaming
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5-15 minutes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15-30 minutes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1 – 2 Hours
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1 Days (4/6 hours)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Yes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No



### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), all services provided by the centre - except for the consultancy service - are directed at all categories (Public and private heritage institutions..Professionals and SMEs..., Museums curators... , Professional researchers, General and educational users...).

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections. Direct email contacts are provided for some services (training, access to physical spaces, documentation). Subscription/application is managed in kind of cases with the support of a text form or online platforms.

**Type of resources/contents:** Contents directly provided in the several sections of the official webpage and (pdf) documents represent the most commonly used type of resource for all the services. Specific digital repositories/platforms support the access to training services and digital collections.

**Management:** The official webpage is the main point of access to services, redirecting to dedicated sections or to specific online platforms and repositories (both internal and external).

**Access conditions:** Most of the services provided are available upon fee payment and registration/application. Access to specific services (training courses and collaborative research) is reserved to staff members, students of the centre training courses or partner institutions.

**Language:** The more general contents - presentation of the centre and main services - are provided in several languages: Italian (standard option), English, French and Chinese (zh-Hans).<sup>11</sup> Others are available in Italian (the language of the central country of origin), and/or in Italian and English.

**Links:** Access to information and resources is managed both through internal contents and links to external contents for almost all services provided.

**Level:** The services provided cover both professional (consultancy, dissemination, training, events) and non-professional use (educational services). Social Media could represent a channel accessible to both audiences.

**Delivery mode, timing and credits (only training):** The centre mainly delivers long-term face-to-face or blended programs (more hours divided in modules, several days spread over a quarter or semester, 1-2 years). Exceptions are represented by educational visits. Advanced training and degree courses are available upon application and fee payment. Other training activities are managed through a dedicated online learning platform (CCR Digital Lab). Certificates of attendance and/or training credits are recognized.

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<sup>11</sup> Chinese (Simplified, People's Republic of China).

## **Abstract**

**Category:** OTHER NATIONAL AND INTERNATIONAL CENTRES ON CH

**Sub-category:** Other national research centres and departments with focus on particular type of heritage areas

**Profile:** Discovery is a national archaeological research body that pursues its goals by identifying 'gaps' in knowledge or areas where intense research is required or would be valuable. A dedicated project team is employed for a suitable period to pursue the topic in question. Discovery promotes interdisciplinary research involving experts in the humanities (anthropologists, historians, linguists) and the sciences (particularly environmental archaeology, geoarchaeology, archaeozoology, archaeobotany, and osteoarchaeology). Discovery engages with constantly evolving new technologies in digital imaging and surveying techniques and promotes their introduction into the operation of Irish archaeological more generally.

**Mission:** The Discovery mission is to explore Ireland's past and its cultural heritage by conducting advanced research in Irish archaeology and related disciplines and by disseminating its findings widely to the global community.

**Services:** Discovery develops outreach activities to communicate the results of its projects to the general public as well the academic community. These activities include the publication of scientific books and papers and collaborative outreach projects with national cultural institutions, third and fourth level institutions, local authorities and local heritage partnerships.

**Audience:** Public Institutions, research organisations, companies, universities, students, researchers, general Public, community heritage groups.

**Legal and funds:** **Main Sources:** Discovery is an independent body and an autonomous company – the Discovery Programme Ltd - funded through the Heritage Council (Ireland public body), government research support, EU and other research grants. Financial statements are included in the centre's annual report.<sup>12</sup>

**Main sources:** Official webpage: <https://discoveryprogramme.ie/>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 203-205) on Zenodo.

## **Highlights from the analysis of services**

### **1. PRESENTATION OF SERVICES**

The **description of services** and activities developed and delivered by the centre is provided in the official website, in a dedicated section ('What we do'/header toolbar menu). Specific info on the competence areas is provided in additional/thematic sections accessible from a series of boxes. The contents are provided in English (only). The three main categories of services/activities refer to:

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<sup>12</sup> [https://discoveryprogramme.ie/assets/uploads/2023/01/ANNUAL\\_REPORT\\_2021\\_SML\\_NEW.pdf](https://discoveryprogramme.ie/assets/uploads/2023/01/ANNUAL_REPORT_2021_SML_NEW.pdf).

- Coordination, support and taking part in important initiatives at national (Irish) level (e.g., Archaeology 2025) and projects (e.g., E-RIHS – European Research Infrastructure for Heritage Science) as a partner.
- Community & Engagement, communicating research results from the centre activities to as wide an audience as possible through academic monographs, guidebooks, podcasts, videos, appearance on television and radio, programmes for schools and lots of ‘National Heritage Week’ events.
- ‘Research’, collaborating on projects and providing guidance on several areas and techniques in the Archaeology field, in particular: ‘Digital Documentation’, ‘Marine & Coastal’, ‘Archaeology & Landscape’, ‘Heritage Data’, ‘Aerial Survey & Remote sensing’.

A map (Google Map) shows the geographic location of the project main sites, redirecting to the dedicated thematic sections (‘Where we work’/‘What we do’/header toolbar menu).

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **contact service** is managed from the official website. Email, phone numbers and physical address are available (footer toolbar menu). A text form for inquiries (name, email, subject, message are required), and the general contacts are available in a dedicated section (‘Contact us’/‘About us’/header toolbar menu). For specific services (‘Community & Engagement’) the direct contact of the ‘Public Engagement and Outreach Office’ is provided. Other direct contacts available refer to the staff members, completed by a short bio (‘Our team’/‘About us’/header toolbar menu). The contents are provided in English (only).

### 2.2. Communication

The **general presentation** of the institute/centre is provided in a dedicated section of the official website (‘About us’/header toolbar menu), including sections - organised in single boxes – focusing on: vision & mission, history of the centre, governance, staff, contacts and collaborations. Each aspect is described in additional dedicated sections. The contents are provided in English (only).

**Privacy policy** is briefly described in a dedicated section accessible from the home page (footer toolbar menu) and includes: privacy statement, info and security on collection of personal data, use of cookies and contact information.

The **Communication** service is managed through three main tools (News & Events, Social Media, Digital journal/mailling list).

The **‘News & Events’** section (header toolbar menu) reports info on several types of activities and notices: announcements on projects updates, exhibitions, lectures - for online events links for registration on dedicated platforms (Eventbrite) and direct contacts are provided, and job vacancies (full info are available: nature, role, salary, location, application, etc.). The list (of all events and news, or categories) redirects to dedicated sections providing in-depth info and links to external pages or resources (if applicable).

The centre has a YouTube channel (for past videos and lectures), is present on LinkedIn and on several other **Social Media** platforms (Facebook, Twitter, Instagram). Links are available in the home page (footer toolbar menu). The invitation to ‘join a conversation about archaeological

research in Ireland by following the centre on social media' is provided from the 'engagement' section. The centre curates a digital journal (Ezine) for the users registered to the mailing list aimed at a more direct form of communication, in particular for those who do not engage with social media. A text for sign up is available ('Community & Engagement'/ header toolbar menu). The contents are provided in English (only).

### 2.3. Dissemination

A list of **publications and other documents** curated by the centre - including annual reports (projects updates, public engagement and outreach, research partnerships and collaborations, lectures and publications, etc.), corporate documents, monographs, reports and additional contents (worksheets, guidebooks, resource pack for teachings, etc.) - are available in a dedicated section of the official website ('Resources'/header toolbar menu). Some documents (mainly internal reports or project publications) are open access and can be downloaded from an internal repository; others are available for purchase (direct link to the editor page is provided). Other dissemination resources, relating to participation in research/project activities, are available from the dedicated section ('Projects'/toolbar menu). Additional channels for dissemination, describing the involvement of the centre in several activities, projects and initiatives, refer to the Ezine (available upon registration to the mailing list) and the 'news & events' section of the website, contents published on social media and the YouTube channel (video, webinars, etc.). In particular, videos are available also from the 'Resources' section. The contents are provided in English (only).

### 2.4. Orientation, Guidance and Consultancy

The centre offers **orientation and guidance** on several research areas and techniques in the Archaeology field: Documentation (Photogrammetric survey, Terrestrial Laser Scanning, Selecting a 3D digital documentation method, Close Range Active Techniques); Marine & Coastal (Survey methods, Archaeological Diving, Marine Geophysics, Singlebeam Echosounder Survey, Multibeam echosounders, Airborne Laser bathymetry, Sub bottom profiler, Satellite imagery, Magnetometry); Archaeology & Landscape; Heritage Data (participating in several initiatives and projects which explores the management, archiving, and reuse of archaeological data); Aerial Survey & Remote sensing (Space/Satellite, Imagery/Aerial photography, Aerial sensors, Ground-based geophysical methods). The contents - in the form of text guidelines - are directly provided on the official website in the specific/dedicated sections ('Research'/'What we do'/header toolbar menu). Info and links to external pages related to specific software are made available. **Other forms of consultancy** upon request are not described, but are probably carried out in collaboration or in favour of partners (academic and cultural institutions, public bodies). The contents are provided in English (only).

## 3. TRAINING AND CAPACITY BUILDING

The centre does not provide specific training programmes but organises seminars, lectures, project specific events and launches and outreach events during the 'National Heritage Week'<sup>13</sup> (second half of August every year). For online events, info and registration links (using Eventbrite)

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<sup>13</sup> <https://www.heritageweek.ie/>.

are provided in the 'News&Event' section of the official website. Videos of past webinars are available on the official YouTube channel, and accessible from a dedicated section ('Resources'/header toolbar menu). The centre offers curated content especially for use in schools, available among the publications, in particular a resource pack for teachings to help enhance lessons and a student worksheet on The Bronze Age. 3D models on 'Sketchfab' and '3D icons' websites are highlighted as a valuable tool to help students. Other resources refer to a guidebook and a guide map (available for purchase). Other training initiatives are developed within the framework of the 'Archaeology 2025' initiative<sup>14</sup> and E-RIHS involvement. The contents are provided in English (only).

#### 4. SUPPORT IN INNOVATION AND PROJECTS

##### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre gives access to **several online services** (tools and datasets) from the official website ('Digital Resources'/'Resources'/header toolbar menu). For each item, the title, a brief description and a link redirecting to the specific platform or external web page are provided. The contents are available in English (only). The main tools and datasets refer to:

- The Discovery Programme image archive (on LoCloud) from the wide variety of projects that have been conducted by the centre in the past. The repository gives access also to the 'Leo Swan Aerial Photography Collection' (registration is not required);
- The Mapping Death database of burials and burial sites in Ireland from 1st to 8th century AD including archaeological, onomastic, statistical, mapping and historical data (registration is not required);
- 3D models by Discovery Programme on the 'Sketchfab' platform (to browse the collection registration is not required).
- A series of podcasts is available on 'Soundcloud'.

##### 4.2. Collaborative research (Projects) and Networking

The centre participates in several research projects with a specific focus on application of innovative technologies, digital models and reconstruction, survey methods, etc. in the Ireland Archaeology field. The complete list of on-going and concluded projects is provided in a specific section ('Projects'/header menu bar) describing aim and main results (pictures, videos and maps are also available). Specific events, conferences and other activities related to project involvement are communicated in the 'News&Events' section. The list of main institutional partners and info on other form of collaborations (local heritage groups, museums, Heritage Officers, Libraries, NGOs and organisations with shared goals) are provided in dedicated sections ('Collaboration Partners'/'About us' and 'Community & Engagement'/'What we do'/header toolbar menu). The centre receives partnership proposals across the island of Ireland to develop public archaeology projects. The contents are provided in English (only).

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<sup>14</sup> <https://discoveryprogramme.ie/what-we-do/coordination/archaeology-2020/>.

### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and ...	4.1. Enablig Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Public and private heritage institutions responsible for managing monuments and sites
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
											Professionals and SMEs providing services for preservation, conservation and restoration
											Companies from the creative industry producing heritage-based content, apps, games, education and tourism services
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Museums curators
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional researchers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General and educational users and visitors, tourists
											Others
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>											
	<input type="checkbox"/>										Direct contacts (e-mail /Phone number)
	<input type="checkbox"/>										E-mail
											Focus Groups/taskforces/Thematic Departments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Focus/Dedicated Pages
	<input type="checkbox"/>										General contact (Phone number)
									<input type="checkbox"/>		Specific software/tool
	<input type="checkbox"/>					<input type="checkbox"/>					Text Form

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS			
	2.1 Contacts/Help	2.2. Communication						2.3. Dissemination	2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>TYPE OF RESOURCES/CONTENTS</b>											
<i>What are the types of content, activities and resources through which the services are provided?</i>											
										Best practices and Case studies	
										Blogs	
				<input type="radio"/>		<input type="radio"/>	<input type="radio"/>			Calls/ application (scholarship, Job opportunities, etc.)	
									<input type="radio"/>	<input type="radio"/>	Digital Collections/Resources/Datasets
				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	Events/ Conferences/Lectures/Seminars
<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Contents from the official web page
											Courses
											FAQs
							<input type="radio"/>				Guidelines
											Presentations (slides)
				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	Projects participation/deliverables/results/apps
							<input type="radio"/>	<input type="radio"/>			Publications (Articles, Books, Journals)
							<input type="radio"/>				Reports
<input type="radio"/>				<input type="radio"/>					<input type="radio"/>		Technologies (app, tools, services)
							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		Toolkits/Handbooks/Step by step guide
					<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	Videos
				<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>			Webinars
				<input type="radio"/>	<input type="radio"/>						Workshops
<input type="radio"/>											Other
<b>MANAGEMENT</b>											
<i>How is access to services managed? What is the primary and/or secondary access point?</i>											
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Official Web page

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS				
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Menu bar (Home page)		
	<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>					- Footer bar (Home page)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Dedicated section/page		
							<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Dedicated Platform (internal): repository/ software /other web page		
					<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page		
<b>ACCESS CONDITIONS</b>													
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>													
							<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Registration required		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Registration Not required/foreseen		
											Optional Registration (to access a pro-version)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Free		
							<input type="checkbox"/>				Under Fee		
										<input type="checkbox"/>	Consortium members / Fellows/ Collaborators		
<b>LANGUAGE</b>													
<i>In which language(s) are the services/content/resources provided?</i>													
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	English (only)		
							<input type="checkbox"/>				Multiple languages, besides English		
											Language of the country of origin (only)		
<b>LINKS</b>													
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>													
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal contents		
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Link to external pages or resources		



1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION						3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS		
2.1 Contacts/Help	2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..	
About	Legal	News	Events	Social	Newsletter						
<b>LEVEL</b> <i>What is the level of services/resources?</i>											
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional
	<input checked="" type="radio"/>				<input checked="" type="radio"/>				<input checked="" type="radio"/>		Not professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>											
							<input checked="" type="radio"/>				In presence
							<input checked="" type="radio"/>				Online/Distance
											Asynchronous distance learning
											Synchronous distance learning
											Real-time distance learning/Streaming
											Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>											
											5-15 minutes
							<input checked="" type="radio"/>				15-30 minutes
							<input checked="" type="radio"/>				1 – 2 Hours
											1 Days (4/6 hours)
											More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>											
											Yes
							<input checked="" type="radio"/>				No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), the all services provided by the centre are directed to the categories involved: public and private heritage institutions responsible for managing monuments and sites; associations, NGOs and local communities aiming at maintaining and communicating cultural heritage; professional researchers; general and educational users and visitors, tourists.

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections. Contacts or subscriptions are managed with the support of a text form and external platforms (e.g., Eventbrite).

**Type of resources/contents:** The text and graphic contents directly reported in the several sections of the official webpage represent the support much-used by the centre, integrated by reports, publications and videos. Specific tools and digital repositories/platforms enable the access to 3D models and image datasets.

**Management:** The official webpage is the main point of access to services, redirecting to dedicated sections or to specific online platforms and repositories (both internal and external), managing the resources available.

**Access conditions:** All the services provided by the centre are free and do not require registration. Some publications are available for purchase. Collaborative research is reserved to partners, but the centre is open to collaboration proposals on specific projects in its field of expertise.

**Language:** All contents are available in English (only).

**Links:** Access to information and resources is managed both through internal contents (most) and links to external contents for almost all services provided.

**Level:** The level of services provided is mainly professional with the exception of resources for schools, 3D models and some outreach events suitable for a wider audience. Social Media could represent a channel accessible to both audiences.

**Delivery mode, timing and credits (only training):** The centre mainly organises in person or online short-term (30 minute – 2 hours) lectures and webinars upon registration. Certificates of attendance and/or training credits are not recognized.

## The Getty Center

Getty

### Abstract

**Category:** OTHER NATIONAL AND INTERNATIONAL CENTRES ON CH

**Sub-category:** International research and documentation centres

**Profile:** The Getty Center is a cultural and philanthropic institution dedicated to the presentation, conservation and interpretation of the world's artistic and cultural legacy.

**Mission:** The Getty Center's mission is to advance and share the world's visual arts and cultural heritage for the benefit of all. Through the collective and individual work of its constituent programs, Getty Center pursues its mission in Los Angeles and throughout the world, serving both the general interested public and a wide range of professional communities in order to promote a vital civil society through an understanding of the visual arts and cultural heritage.

**Services:** The Getty Center within its different departments (Getty Conservation Institute; Getty Research Institute; Getty Foundation; J. Paul Getty Museum) provides services and activities in several working areas/fields: Art History (Pursuing new insights through original scholarship); Conservation (Advancing best practices for art and heritage conservation); Digitization & Access (Enabling discovery through digital innovation); Grantmaking (Supporting individuals and institutions in visual art and cultural heritage); Professional Training (Promoting leadership and skills development in art and heritage worldwide). The Getty Center provides some 'popular' tools for cultural heritage practitioners, like the Art & Architecture Thesaurus and the Arches CIDOC-CRM compliant database structure.

**Audience:** The Getty Center audiences are composed of interested people in visual art and cultural heritage of all ages.

**Legal and funds:** The Getty Center is a non-profit private foundation owned by The J. Paul Getty Trust, funded by sponsorships and donations from the Getty Patron Program (Friends, Associates, Fellows, Partners, Benefactors).

**Main Sources:** Official webpage: <https://www.getty.edu/>, 4CH Deliverable D2.1 – [Report on CC](#) (pp. 188-191) on Zenodo.

### Highlights from the analysis of services

#### 1. PRESENTATION OF SERVICES

The **description of services** and activities developed and delivered by the centre is provided in a dedicated section of the official website ('Areas of work'/header toolbar menu). Specific info on the competence areas is provided in additional/thematic sections accessible from a series of boxes. The main projects and initiatives, advancing and supporting art and conservation research, practice, and training are organised by area and refer to: 'Art History', 'Conservation', 'Digitization & Access', 'Grant making' and 'Professional Training'. The thematic section gives access to info and resources on workshops, courses, software platform, strategies, resources, publications, collections, etc. A search engine allows for browsing resources by category, organiser (Getty Conservation Institute, Getty Foundation, Getty Research Institute, J. Paul Getty Museum, J. Paul

Getty Trust), and status (active, completed). Services are listed in the home page (footer toolbar menu), grouped as follows:

- ‘Books and Publications’: Getty Publications, Virtual Library, Digital Publishing, Getty Research Journal, Getty Store.
- ‘Education’: Events and Programs, K-12 Resources, School Visits.
- ‘Art and Research’: Getty Library, Art Collection, Research Collection, Search Tools and Databases, Open Content Program.
- ‘Opportunities’: Jobs, Paid Internships, Docents, Volunteers.
- ‘Conservation’: Conservation Institute Projects, Museum Conservation, Publication and Resources.
- ‘Grants & Fellowships’: Grant initiatives, residential fellowship.
- ‘News and Contacts’: News & Stories, Press Room, E-Newsletters, and Contacts.

Access, specific info and links to the dedicated section are available. Contents are provided in English (only).

## 2. CONSULTANCY AND ORIENTATION

### 2.1. Contacts/Help

The **contact service** is managed from the official website in a dedicated section (‘Contact us’/‘News and Contacts’/footer toolbar menu): brief instructions, target users (e.g., for journalists), phone numbers and email addresses are available and organised by macro-categories (Visiting, Common questions, Getty Centre Restaurant, School Groups and Tours, Library, Media Relations, Debt Management Information, Contact Staff, Special Events). Regarding **support**, the centre gives access to a list of FAQs (‘Common Questions’/‘Contact us’/‘News and Contacts’/footer toolbar menu).

The contacts (general and special email and phone number) of the specific ‘Departments’ of the centre (Museum, Research Institute, Conservation Institute, Foundation), and other FAQs sections with different formats (e.g., The Research Institute and Conservation Institute include questions on practical cases - e.g., I have a work of art that needs conservation/restoration. Do you provide private conservation services?; The Foundation allows download of a pdf document, etc.) are available in the individual/dedicated web pages (accessible from the ‘Getty centre’ main website). The contents are provided in English (only).

### 2.2. Communication

The **general presentation** of the institute/centre is provided in a dedicated section of the official website (‘About us’/header toolbar menu) covering several aspects, for instance, mission, featured news, opportunities for collaboration and governance. Each aspect is described in additional dedicated sections. Links to the webpages of the different Departments (Museum, Research Institute, Conservation Institute and Foundation), giving access to in-depth info, are provided (header toolbar menu). The contents are available in English (only).

**Privacy policy, terms of use, policy for open source projects and trademarks** owned by the J. Paul Getty Trust are fully described in a dedicated section accessible from the home page (footer toolbar menu). A dedicated email contact is provided. The contents are provided in English (only).

The **Communication** service is managed through several tools: News, Events, Social Media, and Newsletter. The specific sections are available from the home page (footer toolbar menu). The contents are available in English (only).

The **'News & Stories'** section gives access to the latest about Getty's work, collections, and exhibitions. Info is organised by topics (Ancient Life, Art & Architecture, Inside Getty, Science & Tech), or by source, relevance or users ('All News': all press releases and stories about Getty's projects, exhibitions, and collections; 'New & Noteworthy': highlights; 'Getty Magazine': In-depth stories and personal perspectives; 'Resources for Journalists': press contacts, images, press kit, and information for the news media – available from an internal repository or under registration to the 'Hightail' platform). The type of contents mainly refers to texts and images reported on the official website.

A **calendar of events and exhibitions** is available from a dedicated section ('What's On'/header toolbar menu) and organised by highlights, events, online events, exhibitions (current, future, past). Events are presented by keyword/type (online events/performances, films, talks, tours, family, courses, food, exhibitions), organiser (Getty centre, Getty villa, both). For each event, info, description, access conditions (free/paid, sign-up or ticket are required or not), link for registration and direct contacts, are provided. Exhibitions (current, future and past) are listed in chronological order. For each item a brief description, info, a selection of works, any publications or additional resources are available.

The specific departments of the centre are present on several and different **social media**: Facebook, Instagram, Twitter, LinkedIn, Soundcloud, and Weibo. Links are available in the home page (footer toolbar menu) and listed in the 'Contact us' section.

The centre curates several **thematic e-newsletter** of different frequency: weekly (2), informing about articles, videos, podcasts, creative hands-on projects and more in this weekly roundup of Getty stories; and on new arrivals, private sales, and special offers of the museum store; periodic (1), about exclusive offers and news about theatre productions, concerts, special events, and more offers; every two months (2), updating on activities of the Getty Conservation Institute and timely information for conservation professionals; and on exhibitions, events, and stories from the Getty Villa Museum that illuminate the ancient Mediterranean; quarterly (2) on recent grants and funding opportunities from the Getty Foundation; and about collection, exhibitions, and initiatives of the J. Paul Getty Museum; occasional (1), focusing on new books from Getty Publications, with periodic special mailings; monthly (1), informing latest resources, publications, lecture series, and stories from the Getty Research Institute. From a dedicated section ('E-Newsletter'/ News and Contact/ footer toolbar menu) is it possible to select one or more newsletters and subscribe using a text form (name, surname, email, country).

### 2.3. Dissemination

The centre gives access to **several dissemination resources** from a dedicated section of the official website ('Books and Publications'/footer toolbar menu). The contents are available in English (only). Specific direct contacts are provided. The 'Getty Publications Virtual Library' made available more than 300 books (to read and download for free, from an internal repository): a search engine allows research by title, author, keyword, program, type, subject or series. Abstract, table of content and authors are reported in dedicated pages; resources can be read online from an

external platform (Google Books), downloaded, bought in the printed version (from the Museum online shop) or viewed on WorldCat catalog. Other publications, on several topics (Architecture & L.A. Area, Art Techniques & Education, Children's Books, Gardens & Cooking, Getty Publications, History/Art History/Conservation, Manuscripts, Paintings/Drawings/Sculpture, Photography Books) are available for sale in the online shop. The centre publishes an open access digital magazine, made available in pdf ('Getty Magazine'/'News & Stories'/footer toolbar menu). The centre promotes digital publishing by making available open access online resources, produced with a multi-format publishing open source tool ('Quire'). The Getty Research institute releases a Journal ('The Getty Research Journal') edited by the University of Chicago Press Journal, including peer-reviewed articles on the visual arts of all cultures, regions, and time periods. Access to full contents requires subscription (fee). Other dissemination resources, relating to participation in research/project activities, are made available as web contents/articles ('News & Stories'/footer toolbar menu). Additional channels for dissemination, describing the involvement of the centre in several activities, projects and initiatives, refer to the 'news & events' section of the web page, contents published on social media.

#### 2.4. Orientation, Guidance and Consultancy

The centre, through its internal Departments, offers **orientation and guidance** on: knowledge and advancing understanding of the visual arts and their various histories using its expertise, active collecting program, public programs, institutional collaborations, exhibitions, publications, digital services, search tools and databases (e.g., research Library and Special Collections), and residential scholars programs (Getty Research Institute - GRI); advanced conservation practices in several areas – built heritage, objects and collections, education and dissemination - through scientific research, education and training, field projects, and disseminating information in a variety of forms (Getty Conservation Institute - GCI). Both institutes make available a wide amount of resources accessible through different search engines/portals - including project descriptions, guidelines, publications, teaching materials, newsletter articles, conferences and lectures, and videos. The access is free and registration seems to be not required. Guidance and support on how to use the searching instruments are provided in the dedicated sections of the specific web pages. Other forms of consultancy are carried out within the project activities in collaboration with partners (academic and cultural institutions, public bodies, etc.). In the FAQs section, as for the GCI, is specified that the centre does not provide services for private clients, redirecting to the searchable directory of private conversations managed by the American Institute for Conservation (AIC).<sup>15</sup> The contents are provided in English (only).

### 3. TRAINING AND CAPACITY BUILDING

The centre provides several **training programmes and educational resources**.

The available initiatives (courses, workshops, internships, scholar programs, etc.) are described in dedicated sections of the official website ('Professional Training'/'Our work'/header toolbar menu and 'Education'/footer toolbar menu). The different departments manage the specific activities.

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<sup>15</sup> <https://www.culturalheritage.org/about-conservation/find-a-conservator>.

Training for professional development foreseen in-person and synchronous courses and/or workshops (also using external platforms, e.g., Zoom, YouTube, etc.) providing attendance credits: application and/or registration are required. Description and materials from past training activities are available, while the active courses are listed in the dedicated section, including all required info ('Projects & Initiatives'). The centre offers several scholars programs: undergraduate Internships, graduate Internships, and post-baccalaureate internships. Other initiatives refer to non-residential grants to support scholars throughout the world and residential fellowships. Info on active initiative and application conditions are provided in a dedicated section ('Internships & Fellowships'/'Work with us'/header toolbar menu). Educational initiatives address the needs of K–12 teachers and students through webinars, online speaker programs, in-depth workshops, programs, etc. Some additional resources for asynchronous learning (Curricula and Teaching Guides; Student Activities; publications on free education activities, etc.) are open access and directly provided in the specific section of the web page (K–12 Teachers and Students/Education/footer toolbar menu). Other activities, developed by the education department, refer to visits targeted for schools (both on site and virtual via Zoom, upon request); courses, lectures, conversations, tours, and talks, and other programs for target audiences, including college and university faculty, teens, kids and families. General info is provided in the dedicated section ('Education'/'J. Paul Getty Museum') while registration and dates are available from the calendar of events. The contents are provided in English (only).

#### 4. SUPPORT IN INNOVATION AND PROJECTS

##### 4.1. Enabling technologies, datasets access/sharing, physical equipment

The centre offers and manages **several online services** (tools and datasets supporting work and study in art and cultural heritage) developed by the different departments, and made available from the official website ('Resources'/header toolbar menu).

The resources are grouped by main categories:

- 'Art and research collections from Getty Museum and Library collections' (art collection; books, archives and services of the Getty Library; open content of artwork images for any purpose; special collections including highlights from archival holdings);
- 'K-12 teaching', resources for art education (lesson plans to be used in classrooms, info on school visits, internships and summer programs for teens; museum programs for families and users of all ages);
- 'Research databases', including: abstract of research results (AATA Online), multilingual vocabularies, info on provenance records, digitised books from world libraries;
- 'Software and APIs', giving access to open-source tools supported by the centre (free datasets on Github, tools supporting digital publishing ('Quire'), International standards for image access ('IIIF'), software/platform for heritage data management ('Arches').
- 'Internships and Grants': info and resources on the different programs offered;
- 'Features Publications'.

For each item a link to access or browse the resources, redirecting to the specific platform, internal or external web page are provided. The contents are provided in English (only).

The same resources are listed following an additional and different classification: 'Books and Publications' (print and digital books published by Getty); Collection Materials (art and archival

holdings); ‘Conservation Resources’ (tools for art and heritage conservation); ‘Getty Vocabularies’ (Thesauri for cataloguing and research); ‘Grant Reports’ (findings from Getty Foundation grants); ‘K-12 Education’ (free resources for classroom and home use); ‘Library resources’ (online and on-site services from Getty Library).

#### **4.2. Collaborations and collaborative research (Projects)**

The centre promotes, develops and participates in several research and applicative research projects in art and heritage conservation, visual art and cultural heritage through its Research and Conservation Institutes. The list of on-going and concluded projects, advancing and supporting art and conservation research, practice, and training is provided in a specific section (‘Projects & Initiatives’/‘Our Work’/header menu bar). Each project is fully described, including category, years, status, organiser, goal, publications and related resources (redirecting to the specific internal or external repository). Collaborations are reserved to partners, directly selected by the centre on specific activities/projects or upon request/proposal. The list of main partners is provided in dedicated sections of the two institutes’ websites. Other possibilities of collaborations with the centre refer to: grants, available by application; paid internships; volunteers (by application) jobs – all the open positions are presented using a search form. All the info is available in a dedicated section (‘Opportunities’/footer toolbar menu). The contents are provided in English (only).



### Synthesis framework: Services and Variables analysed

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and ...	4.1. Enablig Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>USERS</b> <i>Who are the services addressed to considering the categories defined in D1.2?</i>											
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Public and private heritage institutions responsible for managing monuments and sites
											Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professionals and SMEs providing services for preservation, conservation and restoration
											Companies from the creative industry producing heritage-based content, apps, games, education and tourism services
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Museums curators
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Professional researchers
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	General and educational users and visitors, tourists
											Others
<b>SUPPORTING TOOLS/STRUCTURES</b> <i>What support devices are used?</i>											
	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Direct contacts (e-mail /Phone number)
	<input checked="" type="radio"/>										E-mail
								<input checked="" type="radio"/>			Focus Groups/taskforces/Thematic Departments
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Focus/Dedicated Pages
	<input checked="" type="radio"/>	<input checked="" type="radio"/>									General contact (Phone number)
				<input checked="" type="radio"/>	<input checked="" type="radio"/>				<input checked="" type="radio"/>		Specific software/tool
				<input checked="" type="radio"/>		<input checked="" type="radio"/>				<input checked="" type="radio"/>	Text Form

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help	2.2. Communication					2.3. Dissemination		2.4. Orientation, Guidance and...	4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social					
<b>TYPE OF RESOURCES/CONTENTS</b> <i>What are the types of content, activities and resources through which the services are provided?</i>											
				<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	Best practices and Case studies	
										Blogs	
				<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	Calls/ application (scholarship, Job opportunities, etc.)	
				<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	Digital Collections/Resources/Datasets	
				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Events/ Conferences/Lectures/Seminars	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Contents from the official web page	
				<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	Courses	
	<input type="radio"/>							<input type="radio"/>		FAQs	
								<input type="radio"/>	<input type="radio"/>	Guidelines	
								<input type="radio"/>		Presentations (slides)	
				<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	Projects participation/deliverables/results/apps	
				<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Publications (Articles, Books, Journals)	
				<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	Reports	
				<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	Technologies (app, tools, services)	
								<input type="radio"/>	<input type="radio"/>	Toolkits/Handbooks/Step by step guide	
								<input type="radio"/>	<input type="radio"/>	Videos	
				<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	Webinars	
				<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	Workshops	
										Other	
<b>MANAGEMENT</b> <i>How is access to services managed? What is the primary and/or secondary access point?</i>											
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Official Web page	

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING	4. SUPPORT IN INNOVATION AND PROJECTS				
	2.1 Contacts/Help	2.2. Communication							2.3. Dissemination	2.4. Orientation, Guidance and...		4.1. Enabling Tech....	4.2. Collaborative..
		About	Legal	News	Events	Social	Newsletter						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- Menu bar (Home page)		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>			- Footer bar (Home page)		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- Dedicated section/page		
							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Dedicated Platform (internal): repository/ software /other web page		
			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Dedicated Platform (external): repository/ software /other web page		
<b>ACCESS CONDITIONS</b>													
<i>Is registration or affiliation required to access the service? Are the services free and/or under fee access?</i>													
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration required		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registration Not required/foreseen		
											Optional Registration (to access a pro-version)		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Free		
				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Under Fee		
										<input checked="" type="checkbox"/>	Consortium members / Fellows/ Collaborators		
<b>LANGUAGE</b>													
<i>In which language(s) are the services/content/resources provided?</i>													
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	English (only)		
											Multiple languages, besides English		
											Language of the country of origin (only)		
<b>LINKS</b>													
<i>Are the services and related resources managed internally at the centre or are they integrated by and/or outsourced to external institutions/centres</i>													
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Internal contents		
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Link to external pages or resources		

1. PRESENTATION OF SERVICES	2. CONSULTANCY AND ORIENTATION							3. TRAINING AND CAPACITY BUILDING		4. SUPPORT IN INNOVATION AND PROJECTS		
	2.1 Contacts/Help		2.2. Communication					2.3. Dissemination	2.4. Orientation, Guidance and...			
	About	Legal	News	Events	Social	Newsletter					4.1. Enabling Tech....	4.2. Collaborative..
<b>LEVEL</b> <i>What is the level of services/resources?</i>												
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Professional
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not professional
<b>DELIVERY MODE (if applicable)</b> <i>How are the teaching modules delivered?</i>												
								<input type="radio"/>				In presence
								<input type="radio"/>				Online/Distance
								<input type="radio"/>				Asynchronous distance learning
								<input type="radio"/>				Synchronous distance learning
								<input type="radio"/>				Real-time distance learning/Streaming
								<input type="radio"/>				Blended
<b>TIMING (if applicable)</b> <i>What is the average duration of the teaching modules?</i>												
								<input type="radio"/>				5-15 minutes
								<input type="radio"/>				15-30 minutes
								<input type="radio"/>				1 – 2 Hours
								<input type="radio"/>				1 Days (4/6 hours)
								<input type="radio"/>				More Days
<b>CREDITS (if applicable)</b> <i>Does the centre recognize training credits or certificates of attendance?</i>												
								<input type="radio"/>				Yes
								<input type="radio"/>				No

### **Variables analysed: traversal aspects to the portfolio of services**

**Users:** Considering the macro categories identified (WP1, T1.4), the services provided by the centre are directed to all featured categories: public and private heritage institutions responsible for managing monuments and sites; Professionals and SMEs providing services for preservation, conservation and restoration; Museum curators; Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage; Professional researchers; and General and educational users and visitors, tourists.

**Supporting Tools/Structures:** Most of the services are managed from the official webpage through focus/dedicated sections, in some cases with the support of a text form and external platforms. Direct contacts are provided for almost all services.

**Type of resources/contents:** The text and graphic contents directly reported in the several sections of the official webpage represent a support very used by the centre. Other recurring types of resources refer to publications, toolkits and guidelines. Specific digital repositories/platforms support the access to documents collections and image datasets.

**Management:** The official webpage is the main point of access to services, redirecting to dedicated sections or to specific online platforms and repositories (both internal and external). The web sites of the individual departments are currently under transformation and the main page works as a sort of general index/catalogue to access the huge amount of contents, resources, tools and info made available to users.

**Access conditions:** Most of the services provided by the centre are free and do not require registration (except for some publications and events available for purchase, and specific services - e.g., newsletter and some events). Collaborative research is reserved to partners, but the centre is open to several opportunities (by application) to students, researchers, volunteers, etc.

**Language:** All contents are available in English (only).

**Links:** Access to information and resources is managed both through internal contents (most) and links to external contents for almost all services provided.

**Level:** the level of services is both for professional and not professional use, effectively covering a very large and varied audience.

**Delivery mode, timing and credits (only training):** The centre provided several training and educational programs, activities and initiatives, covering different delivery modes (in person, online, and blended). They provide slides (as PDFs) of some of the previous presentations and guidelines. The average timing is equally varied (from 15-30 minutes to longer training periods). Certificates of attendance and/or training credits are recognized for advanced training courses and workshops, internships or fellowships which foreseen a selection by application.

## T4.1 Appendix 2

# Case studies: synthesis framework

Authors: Serena Orlandi, Rossella Roversi (UNIBO)

Key words: case studies, service deployment, service categories, CCs and similar institutions, synthesis framework

<b>1</b>	<b>PRESENTATION OF SERVICES</b>	How the centre presents its services.
<b>2</b>	<b>CONSULTANCY AND ORIENTATION</b>	
2.1	<b>Contacts/Help</b>	How the user/users get in touch with the centre and receive support on specific topics.
2.2.	<b>Communication</b>	How the centre presents itself, communicates events and news, informs users on legal and privacy policies.
2.3.	<b>Dissemination</b>	How the centre disseminates its research activities.
2.4.	<b>Orientation, Guidance and Consultancy</b>	How the centre supports, orients and gives consultancy on specific topics/issues, bringing user/s to become aware of the opportunities of adopting specific technological, organisational or procedural solutions.
<b>3.</b>	<b>TRAINING AND CAPACITY BUILDING</b>	How the centre gives access to training resources, leading users to acquire, develop, strength or increase skills, providing useful tools for the adoption of enabling technologies.
<b>4.</b>	<b>SUPPORT IN INNOVATION AND PROJECTS</b>	
4.1	<b>Enabling Technologies / Datasets access-sharing</b>	How the centre gives access to: specific digital applications/tools, technologies; digital repositories/collections/datasets; specific physical equipment (if applicable).
4.2.	<b>Collaborative Research (Projects)</b>	How the centre manages/presents its involvement in research projects or promotes collaborative research, making available projects outputs and results, creates and promotes interdisciplinary networks.

	1. PRESERVATION OF SERVICES										2. CONSULTANCY AND ORIENTATION										3. SUPPORT IN INNOVATION AND PROJECTS														
	1.1. Preservation of Services					2.1. Contracts/Help					2.2. Communication					2.3. Dissemination					2.4. Orientation, Guidance and Consultancy					3.1. Training and Capacity Building					3.2. Support in Innovation and Projects				
	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY	BANS	Universitat de València	Universitat de Girona	Universitat de Lleida	CEITY					
<b>USERS</b>	Public and private heritage institutions responsible for managing monuments and sites																																		
						</																													



## T4.1 Appendix 3

# Users needs analysis and synthesis framework

Authors: Serena Orlandi, Rossella Roversi (UNIBO)

Key words: user needs analysis, user categories, synthesis framework.

## User need analysis: reading the data collected

**Who are the 4CH users and what are their needs (WP1 – T1.4)?** The research activity of WP1, Task 1.4 leads to the identification of 9 main categories of users (Table 1) and 25 needs (Table 2) associated with specific users' categories and their related jobs, pains and gains, main fields of applications, CH types, and purposes of digitization.

*Table 1. List of user categories as identified by WP1 – Task 1.4 (source: D1.2).*

<i>n.</i>	<i>User categories</i>
UC01	Public and private heritage institutions responsible for managing monuments and sites
UC02	Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization
UC03	Professionals and SMEs providing services for preservation, conservation and restoration
UC04	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage
UC05	Companies From The Creative Industry Producing Heritage-Based Content, Apps, Games, Education And Tourism Service
UC06	General and educational users and visitors, tourists
UC07	Museum curators
UC08	Professional researchers
UC09	Others

*Table 2. List of user needs as identified by WP1 – Task 1.4 (source: D1.2).*

<i>n.</i>	<i>Needs</i>
UN01	Optimized and time-saving procedures for data capturing and processing
UN02	Solutions for adapting content aiming to an inclusive, accessible and barrier-free museum
UN03	Creating interactive museum experiences to better connect visitors
UN04	The need of society to be actively involved in cultural heritage activities, not only as an observer but also as a creator
UN05	Enhancing and making accessible underwater or inaccessible heritage
UN06	The need of comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards
UN07	Spreading knowledge on remote sensing applications for cultural heritage sites
UN08	Common protocols, implementation guidelines and sharing of lessons learned for regeneration and adaptive reuse of historic city centres
UN09	Creating immersive, populated, interactive reconstructions of archaeological sites to enhance users experiences
UN10	The need of high resolution interactive 3D visualization tools
UN11	Smart monitoring systems with minimally invasive installation and analysis systems to identify deterioration processes
UN12	Facilitate digital models sharing and information exchange

<i>n.</i>	<i>Needs</i>
UN13	Highly accurate digital surrogates for conservation method selection and simulation of ageing effects
UN14	Reduced specialised equipment knowledge for diagnosis studies
UN15	The need to have a digital replica for studies and conservation
UN16	Time upgradable 3D modelling
UN17	Visually organize 3D digital archives by the display of different level of information purposes
UN18	Provision of infrastructure and services for data sharing, access and re-use
UN19	Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible
UN20	Generating and customizing visualization that allow users to dynamically and creatively experience digital contents
UN21	Long-term preservation framework for large volumes of digital data
UN22	Availability of digital archiving standards
UN23	Reuse and recontextualization assessment standards
UN24	Facilitate networking and share resources in the touristic sector through common communication system based on digital information
UN25	Benefits and provide opportunities for scientific research but also to enable the 'public to explore collections for inspiration, learning and enjoyment' and 'to research, share and interpret'

**Who are the users reporting a 'higher' number of needs?** 'Professional researchers' (UC08); 'General and educational users and visitors, tourists' (UC06); 'Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization' (UC02); and 'Professionals and SMEs providing services for preservation, conservation and restoration' (UC03) cover between 52% and 40% of the needs as results from the T1.4 mapping activity. Regarding 'Companies From The Creative Industry Producing Heritage-Based Content, Apps, Games, Education And Tourism Service' (UC05), what can be remarked is that the only need mapped corresponds to one of the most 'shared' ones, *Optimized and time-saving procedures for data capturing and processing*, included among the most 'shared' needs (UN01) (Table 3).

Table 3. Users categories and number of shared needs: user categories reporting a higher number of needs are highlighted in blue.

<i>n.</i>	<i>User category</i>	<i>Number of needs</i>	<i>%</i>
UC08	Professional researchers	13 / 25	52%
UC06	General and educational users and visitors, tourists	11 / 25	44%
UC02	Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization	10 / 25	40%
UC03	Professionals and SMEs providing services for preservation, conservation		

n.	User category	Number of needs	%
	<b>and restoration</b>		
UC07	Museum curators	<b>7 / 25</b>	<b>28%</b>
UC01	Public and private heritage institutions responsible for managing monuments and sites	<b>6 / 25</b>	<b>24%</b>
UC04	Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	<b>5 / 25</b>	<b>20%</b>
UC09	Others		
UC05	Companies From The Creative Industry Producing Heritage-Based Content, Apps, Games, Education And Tourism Service	<b>1 / 25</b>	<b>4%</b>

**What are the needs ‘shared’ among several user categories?** Most of the 25 mapped needs cover a few categories of users (Table 4): 8 needs out of 25 refer to only a single user category; 7 needs out of 25 refer to only two users categories; there are only 2 needs out of 25 that are relevant to seven of the user categories, and none that are relevant to eight or all user groups. This condition reflects that the requirements mapped are very specific and related to quite specific activities (Users’ jobs) and problems (User’s pains), as fully described in D1.2.

Table 4. List of user needs ordered according to the ‘high’ number of user categories involved: the needs shared among several categories are highlighted in blue.

n.	Needs	N. of user categories	%
UN01	Optimized and time-saving procedures for <b>data capturing and processing</b>	<b>7/9</b>	<b>78%</b>
UN04	The need of society to be <b>actively involved in cultural heritage activities</b> , not only as an observer but also as a creator		
UN12	Facilitate <b>digital models sharing</b> and information exchange	<b>5/9</b>	<b>56%</b>
UN18	Provision of <b>infrastructure and services for data sharing, access and re-use</b>		
UN20	Generating and customizing <b>visualization</b> that allow users to dynamically and creatively experience digital contents		
UN05	Enhancing and making accessible <b>underwater or inaccessible heritage</b>	<b>4/9</b>	<b>44%</b>
UN07	Spreading knowledge on remote sensing applications for cultural heritage sites		
UN09	Creating immersive, populated, interactive reconstructions of archaeological sites to enhance users experiences	<b>3/9</b>	<b>33%</b>

<i>n.</i>	<i>Needs</i>	<i>N. of user categories</i>	<i>%</i>
UN10	The need of high resolution interactive 3D visualization tools		
UN19	Availability of <b>tools to gather</b> and integrate <b>diverse digital materials, archive</b> them appropriately and make the information <b>accessible</b>		
UN03	Creating <b>interactive museum experiences</b> to better connect visitors	<b>2/9</b>	<b>22%</b>
UN06	The need of <b>comprehensive risk assessment methods</b> for cultural heritage affected by climate change and natural hazards		
UN11	<b>Smart monitoring systems</b> with minimally invasive installation and analysis systems to identify deterioration processes		
UN16	Time <b>upgradable 3D modelling</b>		
UN17	<b>Visually organize 3D digital archives</b> by the display of different level of information		
UN22	Availability of <b>digital archiving standards</b>		
UN23	Reuse and re-contextualization <b>assessment standards</b>		
UN02	Solutions for <b>adapting content</b> aiming to an inclusive, accessible and barrier-free museum	<b>1/9</b>	<b>11%</b>
UN08	<b>Common protocols, implementation guidelines and sharing of lessons learned</b> for <b>regeneration and adaptive reuse of historic city centres</b>		
UN13	<b>Highly accurate digital surrogates</b> for conservation method selection and simulation of ageing effects		
UN14	<b>Reduced specialised equipment</b> knowledge for diagnosis studies		
UN15	The need to have a <b>digital replica</b> for studies and conservation purposes		
UN21	<b>Long-term preservation framework</b> for large volumes of digital data		
UN24	Facilitate <b>networking and share resources</b> in the <b>touristic sector</b> through common communication system based on digital information		
UN25	Benefits and provide <b>opportunities for scientific research</b> but also to enable the 'public to explore collections for inspiration, learning and enjoyment' and 'to research, share and interpret'.		

**What are the needs considered as most relevant – reporting a higher-ranking rate (considering the preliminary survey among a sample of stakeholders)?** The results from the survey among a sample of stakeholders (See paragraph 3.4.2, [D1.2](#)) show how the attribution of relevance to the individual needs mapped does not always correspond to the most commonly shared requirements, as emerged from the analysis of documents, papers and projects performed by T1.4.

Some of the needs with a high ranking (12 needs out of 25 report a ranking rate above 85%) refer, in many cases (8 needs out of 12), to a reduced number of users (1 or maximum 3 users categories) - as highlighted in Table 2.9. However, these ‘less’ shared needs, in most cases, are attributable to some of the most frequently involved categories of users (UC08 - ‘Professional researchers’; UC06 - ‘General and educational users and visitors, tourists’; UC02 - ‘Decision-makers and national public bodies (i.e. ministries) promoting policies and strategies for conservation, preservation and digitization’, and UC03 - ‘Professionals and SMEs providing services for preservation, conservation and restoration’ (Table 3).

*Table 5. Selection of user needs reporting a higher ranking rate. The needs shared among several categories are highlighted in blue.*

n.	Need Description	High Ranking rates		N. of user categories
		Artefacts	Monuments and sites	
UN12	Facilitate digital models sharing and information exchange	90%	<b>90%</b>	<b>5/9</b>
UN18	Provision of infrastructure and services for data sharing, access and re-use	92%	<b>83%</b>	<b>5/9</b>
UN19	Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible	92%	<b>79%</b>	<b>3/9</b>
UN01	Optimized, cost-efficient and time-saving procedures for data capturing and processing	85%	<b>81%</b>	<b>7/9</b>
UN06	The need of comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards	N/A	<b>81%</b>	<b>2/9</b>
UN08	Common protocols, implementation guidelines and sharing of lessons learned for regeneration and adaptive reuse of historic city centers	N/A	<b>79%</b>	<b>1/9</b>
UN17	Visually organize 3D digital archives by the display of different level of information	N/A	<b>76%</b>	<b>2/9</b>
UN21	Long-term preservation framework for large volumes of digital data	88%	N/A	<b>1/9</b>
UN22	Availability of digital archiving standards	88%	N/A	<b>2/9</b>
UN20	Generating and customizing visualization that allow users to dynamically and creatively experience digital contents	85%	N/A	<b>5/9</b>
UN23	Reuse and re-contextualization assessment standards	81%	N/A	<b>2/9</b>
UN25	Benefits and provide opportunities for scientific research	79%	N/A	<b>1/9</b>

	but also to enable the 'public to explore collections for inspiration, learning and enjoyment' and 'to research, share and interpret			
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**What are the fields of application of the mapped needs?** Regarding the fields of application of the mapped user needs, 'Technologies/models' results as the most shared one (19 needs out of 25), followed by 'Digital Archives' (11 needs of of 25), 'Knowledge Sharing And Visualisation' (8 needs of 25), 'ICTs in Museum' (4 out of 25) and 'Education' (3 out of 25).

Focusing on the 'most shared' needs, n.4 out of 5 are attributable to the 'Technologies/models' area (UN04, UN01, UN12, UN20). The same condition is true for the 'Digital Archives' and 'Knowledge Sharing And Visualisation' fields (UN04, UN018, UN12, UN20). The 'ICTs in Museum' covers just one of the most shared needs (UN01), while the 'Education' one, includes two needs (UN12, UN18). Another aspect to be highlighted is that the most shared needs (highlighted in blue in Table 6) often cover multiple fields of application, with some exceptions (e.g., UN01).

Table 6. List of user needs considering the field of application: needs covering a higher number of fields, the most 'shared' needs, fields and the number of corresponding user categories are highlighted in blue. The numbers in the 'fields of application' cells - from 1 to 5 - refer to the order of relevance indicated by T4.1.

n.	Needs	CH Type		Number of fields	Fields of application					Number of User categories
		Artefacts	Monuments and sites		Technologies / models	ICTs in Museum	Knowledge Sharing And Visualisation	Digital Archives	Education	
UN01	Optimized and time-saving procedures for data capturing and processing			2/5	1	2				7/9
UN02	Solutions for adapting content aiming to an inclusive, accessible and barrier-free museum			1/5		1				1/9
UN03	Creating interactive museum experiences to better connect visitors			3/5	2	1	3			2/9
UN04	The need of society to be actively involved in cultural heritage activities, not only as an observer but also as a creator			3/5	2		1	3		7/9
UN05	Enhancing and making accessible underwater or inaccessible heritage			2/5	1		2			4/9
UN06	The need of comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards			1/5	1					2/9
UN07	Spreading knowledge on remote sensing applications for cultural heritage sites			4/5	2		3	4	1	4/9
UN08	Common protocols, implementation guidelines and sharing of lessons learned for regeneration and adaptive reuse of historic city centres			1/5	1					1/9
UN09	Creating immersive, populated, interactive reconstructions of archaeological sites to enhance users experiences			2/5	2	1				3/9
UN10	The need of high resolution interactive 3D visualization tools			1/5	1					1/9
UN11	Smart monitoring systems with minimally invasive installation and analysis systems to identify deterioration processes			1/5	1					2/9
UN12	Facilitate digital models sharing and information exchange			4/5	1		4	2	3	5/9
UN13	Highly accurate digital surrogates for conservation method selection and simulation of ageing effects			1/5	1					1/9
UN14	Reduced specialised equipment knowledge for diagnosis studies			1/5	1					1/9
UN15	The need to have a digital replica for studies and conservation			1/5	1					1/9
UN16	Time upgradable 3D modelling			2/5	1			2		2/9



n.	Needs	CH Type		Number of fields	Fields of application					Number of User categories	
		Artefacts	Monuments and sites		Technologies / models	ICTs in Museum	Knowledge Sharing And Visualisation	Digital Archives	Education		
UN17	Visually organize 3D digital archives by the display of different level of information purposes			2/5	1				2		2/9
UN18	Provision of infrastructure and services for data sharing, access and re-use			3/5			2		1	3	5/9
UN19	Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible			2/5	2				1		3/9
UN20	Generating and customizing visualization that allow users to dynamically and creatively experience digital contents			3/5	2		3		1		5/9
UN21	Long-term preservation framework for large volumes of digital data			1/5					1		1/9
UN22	Availability of digital archiving standards			1/5					1		2/9
UN23	Reuse and re-contextualization assessment standards			1/5					1		2/9
UN24	Facilitate networking and share resources in the touristic sector through common communication system based on digital information			1/5					1		1/9
UN25	Benefits and provide opportunities for scientific research but also to enable the 'public to explore collections for inspiration, learning and enjoyment' and 'to research, share and interpret'			1/5			1				1/9

## User need analysis: synthesis framework

### Instructions for consultation

The table systematises some of the information mapped from T4.1 and reported in Deliverable D1.2 - *Initial report on user needs*, in particular: needs, rating, purpose of digitization, field of application, and user categories involved.

- The entries are ordered according to the needs number (from 1 to 25) as reported in the D1.2.
- The entries **highlighted in blue** correspond to the needs evaluated with a **higher-ranking rate (75%-100%)**.
- The other items (needs, users, purpose and fields), **highlighted in blue, shown in small capitals and underlined**, correspond to the **most frequent ones** (i.e., shared among more categories of users regarding the needs; and mapped into multiple needs regarding the 'purpose', 'field of application' and 'user categories involved').
- The numbers indicate the order of relevance with which they were mapped in D1.2.

E.g.:

The first user need '[UN01 - OPTIMIZED AND TIME-SAVING PROCEDURES FOR DATA CAPTURING AND PROCESSING](#)' reports an high-ranking rate (81%); it is relevant for the '[CONSERVATION](#)' purpose (the most shared one) and for the '[TECHNOLOGIES / MODELS](#)' and '[DIGITAL ARCHIVES](#)' fields of application (listed as the most frequent); it is shared among 7 out of 9 users categories, with respect to which '[UC02 - DECISION-MAKERS AND NATIONAL PUBLIC BODIES \(I.E. MINISTRIES\) PROMOTING POLICIES AND STRATEGIES FOR CONSERVATION, PRESERVATION](#)', '[UC03 - PROFESSIONALS AND SMES PROVIDING SERVICES FOR PRESERVATION, CONSERVATION AND RESTORATION](#)' and '[UC08 - PROFESSIONAL RESEARCHERS](#)' are included (three user categories among those covering a higher number of needs).

The '[UN06 - The need of comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards](#)' is highlighted in blue due to its high-ranking rate (81%). Other blue cells correspond to high-shared entries ([UC02 - DECISION-MAKERS AND NATIONAL PUBLIC BODIES...](#)' as user, and '[TECHNOLOGIES / MODELS](#)' as field of application).

The '[UN03-Creating interactive museum experiences to better connect visitors](#)', it is not highlighted due to the lower number of user categories linked to it (2 out of 9).

The table only highlights when frequent entries are involved (e.g., '[UC06 GENERAL AND EDUCATIONAL USERS AND VISITORS, TOURISTS](#)' as user category, and '[TECHNOLOGIES / MODELS](#)' as field of application).

Table 7. User needs analysis: synthesis framework

Number	Needs	Rate and CH Type			Purpose			Field of application				Number of User categories and %	User categories involved									
		Rate (HR= high-ranking rate, MD= Medium ranking rate, LR= Low ranking rate)	Artefacts	Monuments and Sites	CONSERVATION	Preservation	Valorisation	TECHNOLOGIES / MODELS	ICTs in Museum	Knowledge Sharing And Visualisation	DIGITAL ARCHIVES		Education	(UC01) Public and private heritage institutions responsible for managing monuments and sites	(UC02) DECISION-MAKERS AND NATIONAL PUBLIC BODIES (I.E. MINISTRIES) PROMOTING POLICIES AND STRATEGIES FOR CONSERVATION, PRESERVATION AND DIGITIZATION	(UC03) PROFESSIONALS AND SMIES PROVIDING SERVICES FOR PRESERVATION, CONSERVATION AND RESTORATION	(UC04) Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	(UC05) Companies From The Creative Industry Producing Heritage-Based Content, Apps, Games, Education And Tourism Service	(UC06) GENERAL AND EDUCATIONAL USERS AND VISITORS, TOURISTS	(UC07) Museum curators	(UC08) PROFESSIONAL RESEARCHERS	(UC09) Others
UN01	OPTIMIZED AND TIME-SAVING PROCEDURES FOR DATA CAPTURING AND PROCESSING	HR	85%	81%				1	2			7/9	1	6	3	7	4		2	5		
		MR	8%	11%								78%										
		LR	6%	9%																		
UN02	Solutions for adapting content aiming to an inclusive, accessible and barrier-free museum	HR	67%					1				1/9							1			
		MR	24%									11%										
		LR	9%																			
UN03	Creating interactive museum experiences to better connect visitors	HR	70%	70%			2	1	3			2/9							1	2		
		MR	17%	19%								22%										
		LR	13%	11%																		
UN04	THE NEED OF SOCIETY TO BE ACTIVELY INVOLVED IN CULTURAL HERITAGE ACTIVITIES, NOT ONLY AS AN OBSERVER BUT ALSO AS A CREATOR	HR	62%	63%			2		1	3		7/9		5	4	2			1	6	3	7
		MR	15%	22%								78%										
		LR	23%	15%																		
UN05	ENHANCING AND MAKING ACCESSIBLE UNDERWATER OR INACCESSIBLE HERITAGE	HR	67%	57%			1		2			4/9	3		2				1	4		
		MR	19%	23%								44%										
		LR	15%	19%																		
UN06	The need of comprehensive risk assessment methods for cultural heritage affected by climate change and natural hazards	HR		81%			1					2/9	2	1								
		MR		11%								22%										
		LR		9%																		
UN07	SPREADING KNOWLEDGE ON REMOTE SENSING APPLICATIONS FOR CULTURAL HERITAGE SITES	HR	70%	64%			2		3	4	1	4/9	4	2					3	1		
		MR	19%	30%								44%										
		LR	11%	6%																		
UN08	Common protocols, implementation guidelines and sharing of lessons learned for regeneration and adaptive reuse of historic city centres	HR		79%			1					1/9				1						
		MR		11%								11%										
		LR		11%																		
UN09	Creating immersive, populated, interactive reconstructions of archaeological sites to enhance users experiences	HR	60%	70%			2	1				3/9			1				2		3	
		MR	29%	19%								33%										
		LR	10%	11%																		
UN10	The need of high resolution interactive 3D visualization tools	HR	67%	70%			1					1/9								1		
		MR	21%	20%								11%										
		LR	13%	11%																		

Number	Needs	Rate and CH Type			Purpose	Field of application					Number of User categories and %	User categories involved												
		Rate (HR= high-ranking rate, MR= Medium ranking rate, LR= Low ranking rate)	Artefacts	Monuments and Sites		CONSERVATION	Preservation	Valorisation	TECHNOLOGIES / MODELS	ICTs in Museum		Knowledge Sharing And Visualisation	DIGITAL ARCHIVES	Education	(UC01) Public and private heritage institutions responsible for managing monuments and sites	(UC02) DECISION-MAKERS AND NATIONAL PUBLIC BODIES (I.E. MINISTRIES) PROMOTING POLICIES AND STRATEGIES FOR CONSERVATION, PRESERVATION AND DIGITIZATION	(UC03) PROFESSIONALS AND SMES PROVIDING SERVICES FOR PRESERVATION, CONSERVATION AND RESTORATION	(UC04) Associations, NGOs and local communities aiming at maintaining and communicating cultural heritage	(UC05) Companies From The Creative Industry Producing Heritage-Based Content, Apps, Games, Education And Tourism Service	(UC06) GENERAL AND EDUCATIONAL USERS AND VISITORS, TOURISTS	(UC07) Museum curators	(UC08) PROFESSIONAL RESEARCHERS	(UC09) Others	
UN11	Smart monitoring systems with minimally invasive installation and analysis systems to identify deterioration processes	HR		74%				1				2/9		2	1									
		MR		13%								22%												
		LR		13%																				
UN12	FACILITATE DIGITAL MODELS SHARING AND INFORMATION EXCHANGE	HR	90%	90%				1	4	2	3	5/9	1	4	5				2		3			
		MR	8%	10%								56%												
		LR	2%	0%																				
UN13	Highly accurate digital surrogates for conservation method selection and simulation of ageing effects	HR	59%					1				1/9			1									
		MR	22%									11%												
		LR	20%																					
UN14	Reduced specialised equipment knowledge for diagnosis studies	HR		59%				1				1/9			1									
		MR		26%								11%												
		LR		15%																				
UN15	The need to have a digital replica for studies and conservation	HR	71%					1				1/9									1			
		MR	17%									11%												
		LR	13%																					
UN16	Time upgradable 3D modelling	HR		70%				1			2	2/9	1									2		
		MR		23%								22%												
		LR		6%																				
UN17	Visually organize 3D digital archives by the display of different level of information purposes	HR		76%				1			2	2/9		1								2		
		MR		15%								22%												
		LR		9%																				
UN18	PROVISION OF INFRASTRUCTURE AND SERVICES FOR DATA SHARING, ACCESS AND RE-USE	HR	92%	83%					2	1	3	5/9		2	1	5			4		3			
		MR	8%	13%								56%												
		LR	0%	4%																				
UN19	Availability of tools to gather and integrate diverse digital materials, archive them appropriately and make the information accessible	HR	92%	79%				2			1	3/9		1					2		3			
		MR	4%	15%								33%												
		LR	4%	6%																				
UN20	GENERATING AND CUSTOMIZING VISUALIZATION THAT ALLOW USERS TO DYNAMICALLY AND CREATIVELY EXPERIENCE DIGITAL CONTENTS	HR	85%	66%				2	3	1		5/9			4				3	2	1	5		
		MR	6%	15%								56%												
		LR	8%	19%																				



## **T4.1 Appendix 4**

### **4CH services: preliminary program**

Authors: Serena Orlandi, Rossella Roversi (UNIBO)

Key words: 4CH services, preliminary programme, service deployment, access rules.

<b>1. CONSULTANCY AND ORIENTATION</b>											
Type of service	Description	Type of access (Remote/ On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)	Registration (Yes/No/ TBD= To be defined)	Charging (Yes/No/ TBD= To be defined)	Language	Management (ECC= European CC, NCCs= National Nodes, both)	Additional support/s	Department/ Office in charge of (if applicable)	Service activation (when the service will be available)
<b>PRESENTATION OF SERVICES</b>	<b>Present the list of services provided, describe the access conditions, Redirect to the dedicated section/s or access point/s</b>	Remote	Automatic	Official website dedicated section (General info)	No	No	English/ Other Languages	ECC and NCCs for specific services	FAQs	The specific Depts. according to the type of service	Launch of the ECC (and continuously updated)
				<b>4CH platform</b> <sup>1</sup> for specific services (access to online tools, Cloud and KB)	Yes	No	English	ECC			
<b>CONTACTS/HELP</b>	<b>Receive contacts and provide information (including manuals) on services access and provision.</b>	Remote	Automatic	Official website dedicated section (General info)	No	No	English	ECC	FAQs Manuals General and/or direct e-mail/s Text form/s	For specific requests a general system could redirect the inquiry to the specific Department of competence, and or to the NCC/s	Launch of the ECC (and continuously updated)
			Interactive (support on specific requests)	4CH platform for specific services (access to online tools, Cloud and KB)	Yes	No		ECC			
<b>COMMUNICATION</b>	<b>Provide general info (mission, governance, partners, departments, statements, etc.)</b>	Remote	Automatic  Interactive (support on specific requests)	Official website dedicated section	No	No	English/ Other Languages	ECC and NCCs	Web contents (texts), videos, documents, presentations, etc.	–	Launch of the ECC (and continuously updated) and NCCs
	<b>Organise, provide and disseminate events and news on CCs activities, topics of research, etc.</b>	Remote	Automatic (For info provision)	Official website dedicated section (General info)	No	No	English/ Other Languages	ECC and NCCs for specific events and news	Newsletter and Social media for dissemination	Communication Dept., Training Dept., Dept. in charge of KB maintenance	Launch of the ECC (and continuously updated)
			Interactive (For specific requests and event/s delivery)	Online platforms (E.g., Zoom) (For delivery)	Yes	No	English/ Other Languages	ECC and NCCs for specific events and news	Dedicated platforms;		
		On-site Blended	Interactive (For specific requests and event/s delivery)	Other physical sites (for delivery)	Yes	No	English/ Other Languages	ECC and NCCs for specific events and news	4CH KB catalogue (remote access to resources)		
	<b>Newsletter</b>	Remote	Automatic	Official website dedicated section (subscription)	Yes	No	English/ Other Languages	ECC	–	Communication Dept.	Launch of the ECC
	<b>Provide info on legal and privacy policies</b>	Remote	Automatic  Interactive (For specific requests)	Official website dedicated section	No	No	English/ Other Languages	ECC	4CH KB catalogue (remote access to resources)	Policies and Strategies Dept.	Launch of the ECC

<sup>1</sup> See D3.1 Design of the CH Cloud and 4CH platform, <https://zenodo.org/record/7701438#.ZD1NiSHONs8>, and D3.2 Integration of the INCEPTION 3D and H-BIM technologies, <https://zenodo.org/record/7701523#.ZD1NiyHONs8>.

1. CONSULTANCY AND ORIENTATION											
Type of service	Description	Type of access (Remote/ On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)	Registration (Yes/No/ TBD= To be defined)	Charging (Yes/No/ TBD= To be defined)	Language	Management (ECC= European CC, NCCs= National Nodes, both)	Additional support/s	Department/ Office in charge of (if applicable)	Service activation (when the service will be available)
<b>DISSEMINATION AND KNOWLEDGE SHARING</b>	<b>Give access to documents and resources concerning the ECC and NCCs research activities</b>	Remote	Automatic	Official website dedicated section (General info)	No	No	English/ Other Languages	ECC and NCCs	-	Dept. in charge of KB maintenance/management with the contribution of other Depts. for metadata collection.	Launch of the ECC (and continuously updated)
				4CH KB catalogue	Yes	No					
<b>ORIENTATION, GUIDANCE AND CONSULTANCY</b>	<b>Give support, Advice and consultancy on specific topics/issues through guidelines, protocols and guidance documents, or through direct contacts.</b>	Remote	Automatic	Official website dedicated section (General info)	No	No	English/ Other Languages	ECC supported by NCC/s	-	Sciences and Technologies Dept. ICT and 3D Dept. Policies and Strategies Dept.	Launch of the ECC (and continuously updated)
				4CH KB catalogue (remote access to metadata of resources)	Yes	No					
			Interactive (for specific requests)	Official website dedicated section	TBD	TBD (for direct consultancy)	ECC supported by NCC/s	External web pages (?)	For direct consultancy a general system could redirect the inquiry to the specific Department of competence or to the NCC/s	Launch of the NCCs	

2. TRAINING AND CAPACITY BUILDING											
Type of service	Description	Type of access (Remote/ On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)	Registration (Yes/No/ TBD= To be defined)	Charging (Yes/No/ TBD= To be defined)	Language	Management (ECC= European CC, NCCs= National Nodes, both)	Additional support/s	Department/ Office in charge of (if applicable)	Service activation (when the service will be available)
<b>TRAINING</b>	<b>Provide and give access to training programme, courses and resources, including guidelines on new training (e.g., curriculum framework)</b>	Remote	Automatic	Official website dedicated events section (general info) and dedicated training providers page	No	No	English/ Other Languages	ECC supported by NCC/s	FAQs General and/or direct e-mail/s or text form/s	Training and education Dept.	Launch of the ECC (and continuously updated)
				4CH KB catalogue (remote access to (metadata of) resources). New materials deposited in external platform, e.g. Zenodo.	Yes	No		ECC supported by NCC/s			
				Online platforms (E.g., Zoom)	Yes	TBD		NCCs supported by ECC	General and/or direct e-mail/s or text form/s		Launch of the ECC
				Other physical sites (plus online platforms)	Yes	TBD					Launch of the NCC/s



<b>3. SUPPORT IN INNOVATION AND PROJECTS</b>											
Type of service	Description	Type of access (Remote/On-site/ Blended)	Modes (Automatic/ Interactive)	Main Access point/s (Official Website, specific platform/s, other web pages)	Registration (Yes/No/ TBD= To be defined)	Charging (Yes/No/ TBD= To be defined)	Language	Management (ECC= European CC, NCCs= National Nodes, both)	Additional support/s	Department/ Office in charge of (if applicable)	Service activation (when the service will be available)
<b>ENABLING TECHNOLOGIES, DATASETS, PHYSICAL EQUIPMENT</b>	<b>Give access to specific digital applications/tools/technologies.</b>	Remote	Automatic  Interactive (support on specific requests)	Official website dedicated section (general info)	No	No	English	ECC and NCC/s for specific services	–	The specific Departments according to the type of service	Launch of the ECC (and continuously updated)
				4CH platform and 4CH Cloud	Yes	No		ECC	FAQs Manuals Direct e-mail/s or text form/s	Sciences and Technologies Dept. ICT and 3D Dept.	
	<b>Give access to digital repositories/collections/datasets</b>	Remote	Automatic  Interactive (support on specific requests)	Official website dedicated section (general info)	No	No	English/ other languages	ECC supported by NCC/s	FAQs Manuals Direct e-mail/s or text form/s	Dept. in charge of KB maintenance/management with the contribution of other Depts. for metadata collection.	Launch of the ECC (and continuously updated)
				4CH KB catalogue	Yes	No					
<b>Access to specific physical equipment (if applicable)</b>	On-site	Interactive (Upon request)	Official website dedicated section (general info)	Yes	TBD	NCCs for physical equipment	Direct contact Text form	Sciences and Technologies Dept.	Launch of NCC/s		
<b>COLLABORATIVE RESEARCH, NETWORKING, POLICY MAKING</b>	<b>Create interdisciplinary networks, support collaborative research; Present involvement in research projects and make available projects outputs and results</b>	Remote	Automatic  Interactive (support on specific requests)	Official website dedicated section (general info)	No	No	English	ECC supported by NCC/s	Direct contact/s Text form	Policies and Strategies Dept.	Launch of the ECC (and continuously updated), NCCs
				4CH KB catalogue (remote access to metadata of resources)	Yes	No					

## T4.3 Appendix 1

# Training profiles: Mapping organisations and users to define training profiles

Author: Pascal Flohr (DANS)

(main) contributor: Kate Fernie (CARARE)

Key words: user groups, training users, training profiles, mappings, organisations



National public bodies	13%	13%	Heritage agencies, public bodies such as ministries and decision-makers (insurance companies, large owners, etc.) who inform policies and strategies for conservation, preservation and digitization.	Public administration		Governmental institution
Companies from the creative industry producing heritage-based content, apps, games, education and tourism services	4%	4%	Professionals and companies from the Creative Industry and Hospitality sectors which re-use data to produce heritage-based content, apps, games, education and tourist services.	Private company	Cultural and creative industries	Private company / research institute
[Professionals and] SMEs providing services for preservation, conservation and restoration	6%	6%	CH professionals and SMEs providing services for preservation, conservation and restoration, including large-scale and high-quality heritage digitization, and exploiting data to plan and manage interventions		Public restoration and conservation enterprise	
				Network organisation		
Associations, NGOs and local communities aimed at maintaining and communicating cultural heritage	8%	8%	?	Other		

D4.2 T4.3 Appendix 1 Table 2 Training users in different types of organisations mapped to 4CH users and 4CH training profiles

4CH D1.1	ECCCH		ARIADNEplus	EUDAT <sup>5</sup>	CESSDA <sup>6</sup>	4CH training profiles
Professional researcher	Researcher	Researcher	Archaeological (field) researcher	Use: Researchers and end-users	Researchers	<b>Practitioner</b>
Decision-makers				Engage: community decision-makers & data managers		<b>Policy maker</b> ( <i>directors, chief executives, etc</i> )
	Managerial position	Management	Director			<b>Manager</b> ( <i>senior curators, project managers, repository managers, etc.</i> )
	Programme / project manager		Manager institutional repository / data access services			
	Digital specialist	Cultural heritage specialist	Manager project databases			<b>Practitioner</b> ( <i>curators, conservators, documentation officers, etc.</i> )
Museum curator	Curator					
	Documentation officer				Research support / research library	
Professional	Conservator					
Non specific	Other				Archives and data repositories	
					Trainers	
General & educational users, visitors & tourists					Citizen scientists	

<sup>5</sup> <https://www.eudat.eu/services/userdoc/user-documentation>

<sup>6</sup> <https://www.cessda.eu/Training-Resources>

## T4.3 Appendix 2

### Training landscape

Authors and contributors: Pascal Flohr (DANS), Serena Orlandi (UNIBO), Rossella Roversi

Note: The spreadsheet include an overview of training and skills development in other CCs, DCCs, projects, etc (some others were added, if very relevant for the training). The list is only of those organisations that were defined in D2.1 as containing some training / capacity building. The aim is to assess for those organisations how they approach this. The document is intended to be provided as a spreadsheet

Key words: training landscape, CCs, DCCs, projects, training and capacity building.

	Name	Project_URL	Field	Aggregator - (digital) Training catalogue?	Training catalogue URL	Developing own Learning resources?	Own Learnings_URL	Type of own learning resources	Learning platform?	Training_courses_titles	Access	License	Qualification					
1. European Commission Competence Centres	1.1	<a href="https://knowledgepolicy.ec.europa.eu/behavioural-insights">https://knowledgepolicy.ec.europa.eu/behavioural-insights</a>	behavioural sciences; policy making	No	N/A	Yes	<a href="https://knowledgepolicy.ec.europa.eu/behavioural-insights">https://knowledgepolicy.ec.europa.eu/behavioural-insights</a>	Online asynchronous training (e.g. module)	EU Learn	Introductory course; A crash course for managers and directors	Login required	Registration	Unclear	No data				
	1.2	<a href="https://knowledgepolicy.ec.europa.eu/foresight">https://knowledgepolicy.ec.europa.eu/foresight</a>	foresight; policy making	No	N/A	Yes	<a href="https://knowledgepolicy.ec.europa.eu/foresight">https://knowledgepolicy.ec.europa.eu/foresight</a>	Online guide; online game; discussion tools	None (directly on webpage)	FoLearn: Online Foresight Guide; FutuGov Game; Migration Discussion Toolkit	Open	Open	Not specified	None				
	1.3	<a href="https://knowledgepolicy.ec.europa.eu/microeconomic-evaluation">https://knowledgepolicy.ec.europa.eu/microeconomic-evaluation</a>	microeconomic analysis; policy making	No	N/A	Yes	<a href="https://knowledgepolicy.ec.europa.eu/microeconomic-evaluation">https://knowledgepolicy.ec.europa.eu/microeconomic-evaluation</a>	Video tutorials (asynchronous); online synchronous seminars; online synchronous webinars	None (directly on webpage) - Previously provided on EU Learn	N/A (not one course, but multiple separate videos); Case studies in microeconomic evaluation	Open and by signing up	Open; Registration	Copyrighted	No data				
	1.4	<a href="https://knowledgepolicy.ec.europa.eu/text-mining">https://knowledgepolicy.ec.europa.eu/text-mining</a>	text mining	No	N/A	? According to D2.1 there is an online tutorial	N/A	Unknown	None yet	Unknown	Unknown	Unknown	Unknown	Unknown				
	1.5	<a href="https://knowledgepolicy.ec.europa.eu/modelling-en">https://knowledgepolicy.ec.europa.eu/modelling-en</a>	modelling	No	N/A	planned but not executed yet	N/A	Unknown	None yet	Unknown	Unknown	Unknown	Unknown	Unknown				
	1.6	<a href="https://knowledgepolicy.ec.europa.eu/technology-transfer">https://knowledgepolicy.ec.europa.eu/technology-transfer</a>	technology transfer	No	N/A	Yes	Not available	Hybrid synchronous workshops in-person workshops	Synchronous workshop / training online	None	Innovation and Technology Transfer in Central and Southeast Europe; Investor readiness training	Unknown (signing up presumably)	Registration	N/A	No data			
	1.7	<a href="https://knowledgepolicy.ec.europa.eu/composite-indicators-and-scoreboards">https://knowledgepolicy.ec.europa.eu/composite-indicators-and-scoreboards</a>	composite indicators and scoreboards	No	N/A	Yes	<a href="https://knowledgepolicy.ec.europa.eu/composite-indicators-and-scoreboards">https://knowledgepolicy.ec.europa.eu/composite-indicators-and-scoreboards</a>	In-person training/workshop	Synchronous workshop / training in-person	No material online	N/A	JRC Week on Composite Indicators and Scoreboards	Open (signing up presumably)	Registration	N/A	No data		
	1.8	<a href="https://knowledgepolicy.ec.europa.eu/cybersecurity">https://knowledgepolicy.ec.europa.eu/cybersecurity</a>	Cybersecurity	No	N/A	some National Coordination Centres provide training services	N/A	N/A	N/A	N/A	N/A	N/A	Unknown	N/A	N/A			
	2. European Commission Knowledge Centres	2.3	<a href="https://idm.ec.europa.eu/knowledge-centre">https://idm.ec.europa.eu/knowledge-centre</a>	disaster risk	No	<a href="https://idm.ec.europa.eu/knowledge-centre">https://idm.ec.europa.eu/knowledge-centre</a>	Yes	<a href="https://idm.ec.europa.eu/knowledge-centre">https://idm.ec.europa.eu/knowledge-centre</a>	Online synchronous training (embedded online curriculum)	Synchronous workshop / training	No material online	None (directly on webpage)	Disaster Risk Management Training Online	Only for students from partners	Restricted	N/A	No data	
		2.6	<a href="https://knowledgepolicy.ec.europa.eu/health-promotion">https://knowledgepolicy.ec.europa.eu/health-promotion</a>	health	No (but they have a Knowledge Base with publications, guidelines)	<a href="https://knowledgepolicy.ec.europa.eu/health-promotion">https://knowledgepolicy.ec.europa.eu/health-promotion</a>	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
		2.8	<a href="https://knowledgepolicy.ec.europa.eu/territorial-policies">https://knowledgepolicy.ec.europa.eu/territorial-policies</a>	policy making	No?	N/A	Yes	<a href="https://knowledgepolicy.ec.europa.eu/territorial-policies">https://knowledgepolicy.ec.europa.eu/territorial-policies</a>	Hybrid synchronous training	Synchronous workshop / training in-person	No material online	N/A	In-person training on the European Handbook for SDG voluntary local reviews	By application	Restricted	N/A	No data	
	4. National Competence Centres (European)	4.1	<a href="https://www.cener.es/">https://www.cener.es/</a>	renewable energy	No	N/A	Yes	<a href="https://www.cener.es/">https://www.cener.es/</a>	Online workshops webinars	Synchronous workshop / training online; Webinars (incl videos of webinars)	No material online	None (directly on webpage)	Falcon 30/50 online workshop; Future of Aerodynamics, loads and control; Photovoltaic technology programme	By registration	Registration; Restricted	N/A	No data	
		4.2	<a href="https://ib-sea.eu/">https://ib-sea.eu/</a>	Industry 4.0	No	N/A	Yes, is collaborating with the Institute for the Diversification and Saving of Energy	<a href="https://ib-sea.eu/">https://ib-sea.eu/</a>	energy certificate Training Planir (12 hour course)	The course description is available; no materials are provided online.	N/A	By application	N/A	No data				
		4.3	<a href="https://www.cdi.it/">https://www.cdi.it/</a>	Open Science; FAIR principles; EODC	No (should be, but not yet available)	<a href="https://www.cdi.it/">https://www.cdi.it/</a>	Yes	Not available	national catalogue of training resources, tools and services	Webinars and courses (in https://ib-sea.eu/content/uploads/2022/01/ib-sea-2022-Catalogo-Formazione-IB-REX.pdf)	Webinar (incl videos of webinars); Course in person; Course asynchronous training	The course description is available; no materials are provided online.	Learning/ix	Big Data; ICT; Security & Blockchain; Additive and Advanced Manufacturing; Collaborative Robotics; Warehousing and AGV; Managerial skills; Sustainability and Social Responsibility.	By application; fee payment	Restricted	N/A	Attendance certificate
		4.4	<a href="https://dms.knaw.nl/">https://dms.knaw.nl/</a>	Open Access Research	No	N/A	Yes	<a href="https://dms.knaw.nl/">https://dms.knaw.nl/</a>	Training & Outreach Online live Q&A, Workshops and meetings (in presence)	Webinar (incl videos of webinars); Course in person; Synchronous workshop / training in person; Static - guide, other document	The course description is available; no materials are provided online.	No data	Open Science, data storage and Research Data Management; storing, managing and archiving and sharing their research data; Computational Social Science ;	By registration	Registration; Paid	CC-BY; other	None	
	5. Digital Research Infrastructures for the Arts and Humanities (DARIAH)	5.1	<a href="https://www.dariah.eu/">https://www.dariah.eu/</a>	Digital Arts And Humanities	Yes	<a href="https://www.dariah.eu/">https://www.dariah.eu/</a>	Yes	<a href="https://www.dariah.eu/">https://www.dariah.eu/</a>	discovery framework and hosting platform for learning resources	Courses, Workshops, Games (asynchronous)	DARIAH Courses	Open access	Open	CC-BY license	Intended Learning Objectives are described			
								<a href="https://learn.dariah.eu/">https://learn.dariah.eu/</a>	platform for Open Educational Resources (OER)	Asynchronous training (e.g. module); Static - video tutorial	DARIAH Teach	Open access	Open	CC-BY license	Intended Learning Objectives are described			
								<a href="https://training.parthenon.eu/">https://training.parthenon.eu/</a>	platform offers lectures and exercises	Static - video tutorial; Course - online	PARTHENOS Training	Open access	Open	CC-BY license	Intended Learning Objectives are described			
							<a href="https://dihor.dariah.eu/">https://dihor.dariah.eu/</a>	Curated platform that provides an overview of the growing range of teaching activities in the field of digital humanities worldwide.	Static - guide, other document	DH Course Registry	Open access	Open	N/A	N/A				
5. Research Infrastructures	5.2	<a href="https://www.clarin.eu/">https://www.clarin.eu/</a>	Languages	yes	<a href="https://www.clarin.eu/">https://www.clarin.eu/</a>	Yes	<a href="https://www.clarin.eu/">https://www.clarin.eu/</a>	texts, essays, etc.	Static - guide, other document	None (directly on webpage)	Open access	Open	CC-BY license	N/A				
							<a href="https://dihor.dariah.eu/">https://dihor.dariah.eu/</a>	Curated platform that provides an overview of the growing range of teaching activities in the field of digital humanities worldwide.	Static - guide, other document	DH Course Registry	Open access	Open	N/A	N/A				
							<a href="http://videolectures.net/">http://videolectures.net/</a>	Online library of talks and tutorials from our training and academic events	Webinar (incl videos of webinars); Static - video tutorial	Videolectures.net	Open access	Open	N/A	N/A				
							<a href="https://www.clarin.eu/">https://www.clarin.eu/</a>	video materials (screencasts or recordings of online events)	see above	Video Channels YouTube	Open access	Open	N/A	N/A				
	5.3	<a href="https://www.openaire.eu/">https://www.openaire.eu/</a>	Open Access Research	Yes	<a href="https://www.openaire.eu/">https://www.openaire.eu/</a>	Yes	<a href="https://www.openaire.eu/">https://www.openaire.eu/</a>	Webinars	Webinar (incl videos of webinars)	YouTube/Zenodo	various Open Access and Open Science topics	By registration, open access	Registration	Creative Commons Attribution 4.0 International	N/A			
						<a href="https://www.openaire.eu/">https://www.openaire.eu/</a>	Online Workshops	Synchronous workshop / training online	Zenodo (Slide)	various Open Access and Open Science topics	By registration, open access	Registration	Creative Commons Attribution 4.0 International	Intended Learning Objectives are described				
5.4	<a href="https://www.cineca.eu/">https://www.cineca.eu/</a>	Supercomputing and its applications, IT services for the members of the Consortium	No	N/A	Yes	<a href="https://www.cineca.eu/">https://www.cineca.eu/</a>	Online Courses, Webinars, Workshops, In person Winter School, Summer Schools and Advanced Schools	Webinar (incl videos of webinars); Course in person	Learn CINECA (https://learn.cineca.it)	supercomputing and related subjects	By registration, FREE OF CHARGE, fee payment	Registration; Paid	No data	Intended Learning Objectives are described				
5.5	<a href="https://www.cesda.eu/">https://www.cesda.eu/</a>	Social science	Yes	<a href="https://www.cesda.eu/">https://www.cesda.eu/</a>	Yes	<a href="https://www.cesda.eu/">https://www.cesda.eu/</a>	Presentations, Webinars, Lessons, Courses, Guides, Exercises, Information sheets	Webinar (incl videos of webinars); Asynchronous training (e.g. module); Static - guide, other document; Synchronous workshop / training online	Zenodo, YouTube	Data discovery, Data management, Data preservation, Data analysis	Open	Open	Creative Commons Attribution 4.0 International	None (Skills level is described)				
DH1	<a href="https://ec.europa.eu/digital-action/marketing-digital-innovation-hubs">https://ec.europa.eu/digital-action/marketing-digital-innovation-hubs</a>	Innovation	No	N/A	Yes	<a href="https://ec.europa.eu/digital-action/marketing-digital-innovation-hubs">https://ec.europa.eu/digital-action/marketing-digital-innovation-hubs</a>	Webinars	Webinar (incl videos of webinars)	Past Presentations and video links area available	Streaming Service of the European Commission (https://webcast.ec.europa.eu)	Open	Open	Not specified	none				

Name	Project_URL	Field	Aggregator - (digital) Training catalogue?	Training catalogue URL	Developing own learning resources?	Own_learnings_URL	Type of own learning resources	Learning platform?	Training_courses_titles	Access	License	Qualification					
8.1	European	<a href="http://europe.europa.eu">http://europe.europa.eu</a>	Cultural Heritage	No	N/A	Yes	<a href="http://europe.europa.eu/european-education">http://europe.europa.eu/european-education</a>	Tools and contents, training materials, video tutorials, webinars, virtual learning environments, online teaching courses, handbooks	Webinar (incl videos of webinars); Static - guide, other document; Asynchronous training (e.g. Moodle); Static - video tutorial	Historiana ( <a href="https://historiana.europa.eu/">https://historiana.europa.eu/</a> ); Europeana ( <a href="https://europeana.eu/organisation/europeana/eun/org/">https://europeana.eu/organisation/europeana/eun/org/</a> ); Vimeo and YouTube (WEBinars)	(Typical) Climate Action; Copyright; Digital skills; Education; Engaging audiences; Impact; Inclusive cultural heritage; Research; Sharing; Data, Tech	Open	Open	All texts are CC BY-None SA, images and media licensed individually			
8.2	France Archive	<a href="http://francearchive.fr">http://francearchive.fr</a>	Cultural heritage promotion	No	N/A	Yes	<a href="http://francearchive.fr/fr/francearchive/17661982">http://francearchive.fr/fr/francearchive/17661982</a>	Exhibitions, methodological courses, workshops, conferences, recreational activities, visits to thematic laboratories, publications.	Exhibitions, methodological course, workshop / training in person; Course - in person	No data	archival activities and materials	Open	Open	Not specified	None		
8.3	CulturalItalia	<a href="http://www.culturalitalia.it">http://www.culturalitalia.it</a>	Cultural Heritage	No	N/A	Unknown											
8.4	General Catalogue of Cultural Properties (Italy)	<a href="http://catalogo.beniculturali.it">http://catalogo.beniculturali.it</a>	Cataloguing the cultural heritage			Unknown											
8.5	Institute for Cataloguing and Documentation (IICD)	<a href="http://www.iicd.beniculturali.it">http://www.iicd.beniculturali.it</a>	IICD is active in research and develop knowledge methods and instruments for cataloguing the Italian archaeological, architectural, artistic and demio-ethnoanthropological heritage.	No?	Yes	Yes	<a href="http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi">http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi</a>	Courses and study days for the training and professional updating of Ministry personnel, public bodies and/or collaborators (lectures, videoconferencing and streaming)	Synchronous - online: workshop / training available online	Some Learning resources are available	e-learning FAD	The cataloguing of cultural heritage	By registration ( <a href="https://portal.iicd.beniculturali.it/portal/2017/2017-2018">https://portal.iicd.beniculturali.it/portal/2017/2017-2018</a> )	Registration; Paid	Creative Commons BY SA	Certificate of Attendance	
				N/A	Yes / working in collaboration with other institutions (e.g., La Sapienza University)	Yes / working in collaboration with other institutions	<a href="http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi">http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi</a>	Summer schools (Presentations available)	Course - in person; Some Learning Static - guide, other resources are document	N/A	Semantic web technologies for cultural heritage. Ontologies for cultural heritage	By application, fee payment				Certificate of Attendance	
				N/A	Yes / working in collaboration with other institutions	Yes / working in collaboration with other institutions	<a href="http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi">http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi</a>	Internships	Other	Some Learning resources are available	N/A	Cataloguing: cataloguing of the different types of cultural heritage: architectural, landscape, historical-artistic, archaeological, demo-ethno-anthropological, naturalistic, numismatic, scientific and technological, music; Photography: arrangement and archiving of photographic funds, valorisation and communication methodologies for cataloguing cultural heritage, computerized cataloguing: museum collections and multimedia documentation, historical photographic techniques, photography: archival treatments and preventive conservation	By application, <a href="http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi">http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi</a>			Not specified	Certificate of Attendance
				N/A	Yes / working in collaboration with other institutions	Yes / working in collaboration with other institutions	<a href="http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi">http://www.iicd.beniculturali.it/it/it/2017-materiali-educativi</a>	International Training Projects (Presentations, slides)	See above	None (directly on webpage)		educational and cultural visits to the services, archives, laboratories of the Institute and to the museum of historical photography	By application			Not specified	Certificate of Attendance
8.6	Central Institute for the Union Catalogue of Italian Libraries and for bibliographic information (ICCU)	<a href="http://www.iccu.it">http://www.iccu.it</a>	Libraries and book heritage	No	N/A	Yes	<a href="http://www.iccu.it/it/it/2017-materiali-educativi">http://www.iccu.it/it/it/2017-materiali-educativi</a>	Courses (in presence, blended)	Course - online: Course - in person	The course description is available, no materials are provided online.	Yes (not specified)	cataloguing regulations, international standards and technological innovation in the library sector	By application	Registration	Not specified	Certificate of Attendance	
8.7	Archaeology Data Service	<a href="https://archaeologydataservice.ac.uk">https://archaeologydataservice.ac.uk</a>	Data management and storage	Yes	Yes	Yes	<a href="https://archaeologydataservice.ac.uk/datacite/resources/whats-new">https://archaeologydataservice.ac.uk/datacite/resources/whats-new</a>	Digital resources (documents, texts, videos, tutorials, etc.)	Static - video tutorial; Static - guide; other document	None (directly on webpage)	multiple time periods and explore historical themes	Open	Open; Paid?	Attribution 4.0 International (CC BY 4.0)	None		
				Yes	Yes	Yes	<a href="https://archaeologydataservice.ac.uk/datacite/resources/whats-new">https://archaeologydataservice.ac.uk/datacite/resources/whats-new</a>	Digital resources (documents, presentations, etc.)	None (directly on webpage)	Open Access Post-Graduate Teaching Materials in Managing Research Data in Archaeology	Open		Attribution-NonCommercial-ShareAlike 2.0 UK, England & Wales (CC BY-NC-SA 2.0 UK)	None			
				Yes	Yes	Yes	<a href="https://archaeologydataservice.ac.uk/datacite/resources/whats-new">https://archaeologydataservice.ac.uk/datacite/resources/whats-new</a>	Training in data management and digital archive for data creators in Academic Research; Undergraduate and postgraduate training courses; Workshops	Course - online	Some Learning resources are available	None (directly on webpage)	Data management planning, The FAIR (findability, accessibility, interoperability, reusability) and CARE (collective, authority to control, responsibility, ethics) data principles, Archive deposition (including ADS-Easy), The importance of Metadata, Standardised vocabularies, Data selection and retention, Digital Preservation, Digital Publication	By application under request		Attribution-NonCommercial-ShareAlike 2.0 UK, England & Wales (CC BY-NC-SA 2.0 UK)	Certificate of Attendance	
8.8	Digital Public Library of America	<a href="https://dpla.org">https://dpla.org</a>	Cultural Heritage	No	N/A	Yes	<a href="https://dpla.org/docs/education-guide-to-dpla">https://dpla.org/docs/education-guide-to-dpla</a>	For primary and secondary education and general public e.g. primary source sets, guides	Static - guide, other Available online document	None (directly on webpage)	Primary Source Sets for classrooms	Open	Open	Not specified	None		
8.9	MUSEU - HUB	<a href="http://www.museu-hub.eu">http://www.museu-hub.eu</a>	Cultural Heritage	No	N/A	Yes	<a href="http://www.museu-hub.eu/en/training-video">http://www.museu-hub.eu/en/training-video</a>	videorecordings of webinars and workshops	Webinar (incl videos of webinars)	Youtube	How to map you data using an excel file, Basic training on Open Wikidata as a complementary tool to enrich metadata, Digital sobriety and GLAMs, Europeana Aggregators Fair- A bridge for museums who want to join Europeana, Museums going digital: why invest on quality digital content?, Benefits of sharing content with Europeana, Copyright in the aggregation of sports content, Copyright in the user contribution of sports content, DIY Digitization: Tips for ambitious GLAMs	Open	Open	Not specified	None		
				N/A	Yes	Yes	<a href="http://www.museu-hub.eu/en/training-video">http://www.museu-hub.eu/en/training-video</a>	Conferences, Seminars, Workshops	See above; Synchronous workshop / training in person; Synchronous workshop / training online	Some resources are available	None (directly on webpage)	MICHAEL CULTURE WORKSHOP "Cultural institutions towards Europeana: opportunities, licenses and IPR issues" Conference "Image and Research" V International Scientific and Practical Seminar, Europeana DSI Workshop: «Publishing on Europeana & tools to make your collection widely visible», Europeana DSI Workshop European Year of Cultural Heritage 2018 (EYCH2018) Official Launch, Cultural heritage communities and audiences in today's digital environment, Save the date: Europeana Conference 2019, MCA webinar, "DIY digitisation: tips for ambitious GLAMs"	By registration	Registration	Not specified	None	
8.11	Connecting Archaeology and Architecture in Europe (CARARE)	<a href="http://www.carare.eu">http://www.carare.eu</a>	Data management and storage	Yes	Yes	Yes	<a href="https://pro.carare.eu/en/training-hub/">https://pro.carare.eu/en/training-hub/</a>	Digital Resources (Reports, presentations, videos, etc.)	Static - video tutorial; Static - guide; other document	Documents (directly on webpage), videos (Vimeo), Slides (Slideshare)	3D and Virtual Reality, Content management systems and repositories, Metadata and vocabularies	Open access	Open	Not specified	None		
				Yes	Yes	Yes	<a href="https://pro.carare.eu/en/training-hub/">https://pro.carare.eu/en/training-hub/</a>	webinars	Webinar (incl videos of webinars)	Vimeo	Step by step, one travels FAIR - Inspiring cultural heritage: 3D reconstructions for story telling and understanding, Using AI to monitor historic towns and landscapes, Using Vocabularies and Linked data	by registration, past events are open		Not specified	None		





**Analysis**

**Does the organisation have a training catalogue / does it aggregate training/learning**

Type of organisation	Yes	No	Unknown/other	Total
EC Competence Centre	0	8	0	8
EC Knowledge Centre	0	3	0	3
National Competence Centre (European)	0	4	0	4
Research Infrastructures	4	1	0	5
DHs	0	1	0	1
Documentation Centres on Cultural Heritage	2	6	2	10
Other national and international centres on Cultural Heritage	0	11		11
<b>Totals</b>	<b>6</b>	<b>34</b>	<b>2</b>	<b>42</b>
	<b>14%</b>	<b>81%</b>	<b>5%</b>	
<i>Not in D2.1</i>	3	0	0	

**Does the organisation develop its own training/learning resources?**

Type of organisation	Yes	No	Unknown/other	Total
EC Competence Centre	6	0	2	8
EC Knowledge Centre	2	1	0	3
National Competence Centre (European)	4	0	0	4
Research Infrastructures	5	0	0	5
DHs	1	0		1
Heritage	8	0	2	10
Other national and international centres on Cultural Heritage	9	1	1	11
<b>Totals</b>	<b>35</b>	<b>2</b>	<b>5</b>	<b>42</b>
	<b>83%</b>	<b>5%</b>	<b>12%</b>	

(outcome logical as these are the 42 organisations from D2.1 that do capacity building; sometimes it is more outreach / sending than actual training though)

**What type of learning resources are produced?**

Learning resource type	n	%			
Webinar (incl videos of webinars)	15	17%	<b>Synchronous</b>	<b>69</b>	<b>80%</b>
Course - in-person	14	16%	<b>Asynchronous</b>	<b>15</b>	<b>17%</b>
Synchronous workshop / training - online	11	13%	<b>Other</b>	<b>3</b>	
Static - guide, other document	11	13%			
Synchronous workshop / training - in-person	10	12%			
Static - video tutorial	8	9%			
Course - online	7	8%			
Asynchronous training (e.g. moodle)	5	6%			
Other	3	3%	<i>incl audio</i>		
Lecture (in person)	2	2%	<i>examples: game, discussion toolkit, internship</i>		
<b>Total of type instances (NOT of organisations)</b>	<b>86</b>	<b>100%</b>			

<b>Online</b>	<b>49</b>	<b>57%</b>
<b>In-person</b>	<b>35</b>	<b>41%</b>

**Is access open or restricted?**

Type of organisation	Open	Registration	Restricted	Paid	Unknown	Total
EC Competence Centre	2	4	0	0	3	
EC Knowledge Centre	0	0	2	0	0	
National Competence Centre (European)	0	2	3	1	0	
Research Infrastructures	3	2	0	1	0	
DHs	1	0	0	0	0	1
Heritage	6	3	0	2	0	
Cultural Heritage	3	3	3	4	1	
<b>Totals</b>	<b>15</b>	<b>14</b>	<b>8</b>	<b>8</b>	<b>4</b>	<b>42</b>
	<b>36%</b>	<b>33%</b>	<b>19%</b>	<b>19%</b>	<b>10%</b>	

*Metadata only category not used*

*because multiple types possible per organisation*

## T4.3 Appendix 3

# Training system use cases

Author: Pascal Flohr (DANS)

Keywords: training, learning and training resources registries, training events registries / listings, learning resource metadata

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5. [CARARE Training Hub](#)
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## Use cases outcomes summary

There are several key observations. Firstly, there are, to a greater or lesser degree, two components of the training systems: training/learning materials and events (e.g. training workshops).

The **training/learning resources/resource metadata registries or catalogues** are in these examples hosted online: CESSDA Training Resources; SSH Training Discovery Toolkit and SSHOC Open Marketplace; ELIXIR's TeSS Materials; ARIADNEplus Training Hub; CARARE Training Hub. There is variation in how this is done and what exactly is put online. SSHOC and TeSS aggregate structured metadata from relevant and trusted providers. CESSDA compiles only CESSDA training materials, but with structured metadata. ARIADNEplus presents main themes, like 'FAIR/Open Science', 'Defining and Implementing a Data Management Plan', and several more, and a number of selected resources per theme, linking to the externally held resource (by project partners or others). In the CARARE Training Hub the resources are also divided by theme, but mostly own materials are presented, which are either held within the website or linked to, with in addition some links to external resources.

Access to the learning resources is generally open, but reuse licences are not always indicated, or there is copyright, both preventing the reuse of the materials. The metadata, when presented, is generally open.

The metadata for CESSDA, SSHOC, and TeSS are structured and based on metadata standards and controlled vocabularies, thesauri, or ontologies, and at least the latter two are machine-readable. Nonetheless, the used terms often differ so that interoperability is not straightforward. For the other three use cases no structured or machine-readable metadata is supplied, decreasing the findability, discoverability as well as interoperability of the resources. On the other hand, this is a much more easily implemented way and by already providing a relevant selection per theme this can in a way also be user friendly.

All the use case organisations have an events section on their website, where they put information about **training events**, whether organised only by others (TeSS), by their own organisation/project/partners, or a mixture of these. The general trend is to provide a mixture of face-to-face workshops (/courses), online workshops/courses, and webinars. Conferences, while not training,<sup>1</sup> are also put in the same events section (i.e. they are treated the same as training events). Both TeSS and CESSDA provide structured metadata for the events, but only TeSS-listed events are searchable and machine-readable.

It could not be fully assessed if the events are freely and openly accessible, since for several of the use cases they are organised by partners or external providers, and since this metadata was mostly not presented in a structured way, it would have involved going to each of the events pages separately. Certainly many of the training events appear to be free,

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<sup>1</sup> It could be argued that webinars are also not training events, but count rather as dissemination or outreach.

but for the face-to-face instances there is normally a limit on the number of participants, and there may be eligibility criteria.

Events materials are frequently made available, especially when it concerns webinars, which are often provided in the form of recordings and slide decks. For other events, and especially face-to-face events, this is rarer, but slide decks are sometimes made available. This is often done through YouTube/Vimeo and Zenodo/Slideshare, to which links are then provided on the webpages of the use case organisations. Zenodo has the advantage that a persistent identifier is added (a DOI) (see section 3.3).

The management, funding, and business case of the training differs between organisations. For most of the examples training is managed and organised by partner organisations or other related organisations, in some cases cooperating through a dedicated training group (e.g. CESSDA Training Workgroup, ELIXIR Training Coordinators Group, with members from different partner organisations). Of the use cases, only CARARE and perhaps ADS are managing their own training, but might still involve partners. The funding mostly comes from projects supporting the organisation/infrastructure, like European Commission funding and other EU funding. The funding can be directly towards the organisation or infrastructure who then assigns a part towards training (e.g. funding for CESSDA in general, partly directed towards the CESSDA Training Workgroup, divided over the partner organisations taking part in the Workgroup). Partners might also provide training in-kind (i.e. through their funding streams).

## Use case descriptions

### 1. CESSDA Training

**D2.1 #:** 5.5

**D2.1 Type:** Research Infrastructure

**Organisation website:** <https://www.cessda.eu/>

**Short description:** CESSDA is the Consortium of European Social Science Data Archives, with members in 21 countries and twelve additional partner countries, with one CESSDA Service Provider per country.. It is an ERIC (European Research Infrastructure Consortium). It has five main pillars, one of which is training, aimed at its service provider staff and the social science user community. This is organised through the Training Working Group, which is formed by members from CESSDA Service Providers.

**Training URL:** <https://www.cessda.eu/Training>

**Target group / audience:** researchers in the social sciences, data professionals, archive staff. (Audience list in the training resources catalogue: researchers; research support at university and research institutes; research libraries; archives and data repositories; trainers; citizen scientists).

**Type of content:** research data management; data discovery, harmonisation, and use; digital preservation; data archiving; CESSDA tools and services. Focus on the social sciences, but part of the content can be generically applied.

#### **CESSDA Training Resources catalogue**

**Training resources:** Only CESSDA training resources are made available, there is no aggregation of non-CESSDA resources. A searchable Training Resource catalogue with rich metadata is available: <https://www.cessda.eu/Training-Resources>. The resources include videos and slides of training events and webinars, but also guides for looking up and self-paced learning, like the Data Management Expert Guide<sup>2</sup> and the Data Archiving Guide.<sup>3</sup>

**Training Resources Metadata:** CESSDA ID; Title; Publication date; Publisher; Author(s); Description; Direct links; Topics; Discipline; [learning resource] Type; Persistent Identifiers (PIDs); Licence and contact/Access cost; Audience; Skill level; Format; Accompanying resources; Part of series/collection. These are not all mandatory. *The general CESSDA Metadata Model is DDI-based,<sup>4</sup> but it is not immediately clear what the Training Resource Metadata source is.*

**Training Resources Licence and Access:** The licence and access cost are indicated for each resource. The CESSDA standard licence is CC BY-SA, but many resources are available

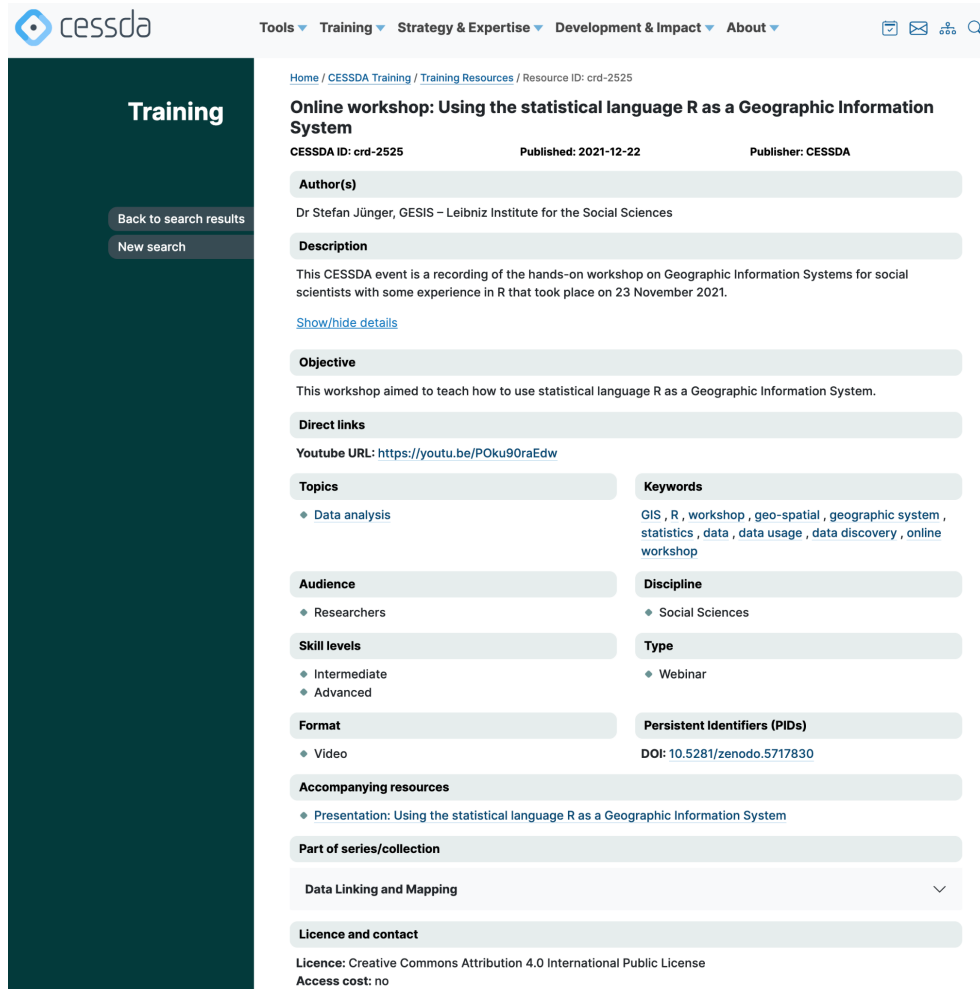
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<sup>2</sup> <https://dmeq.cessda.eu/>

<sup>3</sup> <https://dag.cessda.eu/>

<sup>4</sup> Akdeniz, Esra, & Moilanen, Katja. (2023). CMM CESSDA Metadata Model (3.0). Zenodo. <https://doi.org/10.5281/zenodo.7528240>; <https://www.cessda.eu/Metadata-Office>

as CC BY (Creative Commons Attribution 4.0 International). The resources are available free of charge.



The screenshot shows the CESSDA website interface. The main content area displays details for a training resource with the title "Online workshop: Using the statistical language R as a Geographic Information System". The resource ID is crd-2525, published on 2021-12-22, and published by CESSDA. The author is Dr Stefan Jünger from the Leibniz Institute for the Social Sciences. The description states it is a recording of a hands-on workshop for social scientists with R experience. The objective is to teach how to use R as a GIS. Direct links include a YouTube URL. Topics include Data analysis, and keywords include GIS, R, workshop, geo-spatial, geographic system, statistics, data, data usage, data discovery, and online workshop. Audience includes Researchers, skill levels include Intermediate and Advanced, and the format is Video. The discipline is Social Sciences, and the type is Webinar. The persistent identifier (DOI) is 10.5281/zenodo.5717830. The accompanying resource is a presentation titled "Using the statistical language R as a Geographic Information System". The license is Creative Commons Attribution 4.0 International Public License, and access is free.

T4.3 Appendix 3 Figure 1 Entry in the CESSDA Training Resources overview (CESSDA Training Working Group 2022, <https://www.cessda.eu/Training-Resources/Resource-crd-2525>).

### CESSDA Training Events

**Summary:** CESSDA Service Providers and partners organise training events, like face-to-face and online workshops.

**Events page URL:** <https://www.cessda.eu/Events?training=true>

**Type of training:** Face-to-face workshop; online workshop; webinar.<sup>5</sup>

**Access:** the training events appear to be all free, but to be normally restricted in number of participants; eligibility criteria are clearly outlined on the CESSDA events details page.

<sup>5</sup> Conferences are also organised and shown as training events, but are not included here as they are not actually training.

**Metadata:** Title; Summary; Description; Content; Target audience; Goals; Required knowledge and tools; Eligibility; Start time; End time; Type; Audience; Skill level; Language; Organiser; Website URL; Registration form URL.

**Management:** National CESSDA Service Providers organise the training events.

**Business model:** CESSDA is funded by grants and project revenue;<sup>6</sup> training is further done as part of related projects, or in-kind by the CESSDA national Service Providers.

**Availability of produced resources:** Webinar recordings and slides are made available through the CESSDA Training Resources catalogue. This is typically done by publishing slides (and other documentary material) on Zenodo, which creates a DOI, and by publishing videos on YouTube. The URLs and DOIs are then put into the Training Resource metadata.

## 2. SSHOC training

**D2.1 #:** N/A

**D2.1 Type:** Research Infrastructure

**Organisation website:** <https://sshopencloud.eu/>

**Short description:** Social Sciences & Humanities Open Cloud (SSHOC) was an EU-funded project which ran between 2019 and 2022 with 20 partner organisations. The SSH Open Marketplace is now maintained and will be further developed by three European Research Infrastructures - DARIAH, CLARIN and CESSDA - and their national partners. Its aim is to “transform the ... social sciences & humanities data landscape with its disciplinary silos and separate facilities into an integrated, cloud-based network of interconnected data infrastructures.”<sup>7</sup> As part of this, it was a focus to facilitate training by training the trainers through training events during the project, an online Training Discovery Toolkit aggregating relevant training resources, and through making new training materials available through the SSHOC Open Marketplace.<sup>8</sup> It is not completely clear why the Training Discovery Toolkit and the SSHOC Open Marketplace training materials are in separate locations. The project also set up a SSH training community with a trainer register.

**Training URL:** <https://sshopencloud.eu/training>

**Target group / audience:** Mainly trainers in the Social Sciences and Humanities, but also useful to researchers, (other) data stewards, and service providers.

**Type of content:** Generic and social sciences & humanities. Topics: research data management, open science, didactics; FAIR data; ethical issues; GDPR; data science for the social sciences and humanities; data science for heritage science; text mining for the social sciences and digital humanities.

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<sup>6</sup> CESSDA ERIC Financial Statement 2021. Available through CESSDA Annual Report 2021, <https://www.cessda.eu/CESSDA-Documents/Annual-reports/CESSDA-Annual-Report-2021.pdf>

<sup>7</sup> <https://sshopencloud.eu/about-sshoc>

<sup>8</sup> <https://marketplace.sshopencloud.eu/search?categories=training-material>



## SSH Training Discovery Toolkit

**URL:** <https://training-toolkit.sshopencloud.eu/>

**Summary:** An inventory of training materials relevant to the Social Sciences and Humanities, containing 259 items and 100 sources. The metadata catalogue is searchable through a search bar and by filtering by organisation, audience, language, (curated) topic, discipline, and format. The results can be displayed by training resource items and/or by source. There is also an overview of all sources of training materials, generally organisations.

**Target group / audience:** Mainly trainers in the Social Sciences and Humanities, but also useful to researchers, (other) data stewards, and service providers.

**Type of content:** Generic and social sciences & humanities. Topics: research data management, open science, didactics, FAIR data, programming.

**Learning resource types:** Any online resource: videos, unit/lessons, slides, webinar recordings, games, e-learning modules, etc.


**Training Resources Metadata:** The metadata are based on the RDA Minimal Metadata for Learning Resources and have been mapped to schema.org, so that they are human as well as machine readable.<sup>9</sup> The following fields are included for training items: Title; Basic description; Access point; Source; Licence; Languages; Created [date]; Last updated [date]; contributors/authors/creators; Contrib name; Contrib email; Contrib orcid; Contrib links; Intended audience; Disciplines; Format; Curated topics; Learning outcome(s); Free access; Access condition; Expertise level; Access conditions.<sup>10</sup>

**Training Resources Licence and Access:** The information on the SSHOC website is licenced under a CC BY licence unless otherwise stated. The items are licenced as decided by the source, but their inclusion in the Toolkit generally means they are available under a type of open licence.

---

<sup>9</sup> Ricarda Braukmann, Ellen Leenarts, Simon Saldner, Veronika Keck, Judith Wehmeyer, Alejandra Albuerne, Klaus Illmayer, Matej Durco, Vasso Kalaitzi, Tatsiana Yankelevich, Darja Fiser, Ana Cvek, & Anca Vlad. (2022). D6.11 SSHOC Trainer Toolkit (final) (v1.0). Zenodo. <https://doi.org/10.5281/zenodo.6564283>

<sup>10</sup> Braukmann et al, (2022). D6.11 SSHOC Trainer Toolkit, p. 11-12.


SSH Training Discovery Toolkit

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The SSH Training Discovery Toolkit provides an inventory of training materials relevant for the Social Sciences and Humanities.  
Use the search bar to discover materials or browse through the collections. The filters will help you identify your area of interest.

Search

### Search entities

Displaying 1 - 22 of 22

Item		
Source of item	Title	Description
Australian Research Data Commons Training Materials	ARDC Training Materials Metadata Checklist v1.1	The ARDC Training Materials Metadata Checklist aims to support learning designers, training materials creators, trainers and national training infrastructure providers to capture key information an
CLARIN Depositing Services	CLARIN:EL	clarin:el is the Greek national network of language resources, a nation-wide Research Infrastructure devoted to the sustainable storage, sharing, dissemination and preservation of language resource
Digital Preservation Education Working Group	Digital Preservation Essentials: Pre-ingest and Ingest Workshop	This course equips digital preservation professionals with a range of skills relating to various aspects of receiving, handling, and managing digital content.
CLARIN Depositing Services	Dutch Language Institute	The INT is one of the four CLARIN B Centres in The Netherlands and it serves as an exclusive CLARIN B Centre for Flanders (Belgium).
Danish e-Infrastructure Cooperation (DeiC)	How to FAIR: a Danish website to guide researchers on making research data more FAIR	A website from the Danish National Forum for Research Data Management. Concept of research data management.
Data management support for researchers	LEGO: Metadata for Reproducibility game pack	This is a set of resources for the LEGO® Metadata for Reproducibility game.
CESSDA Resource Directory	Metadata Model Office	Webinar: Accompanying the growing importance of research data management, the provision and maintenance of metadata have obtained a key role in contextualizing,
National Coordination Point Research Data Management: RDM Advice and Tips	Online Data Horror Escape Room	It is an online escape room game that engages researchers with the principles of research data management (RDM).
University of Siena	Oral Archives for Sociolinguistic Research	The goal of the course in sociolinguistics is to show students the possibilities and challenges offered by oral history archives for (socio)linguistic research.

Entity type

- Item (16)
- Source (6)

Organisation

- CLARIN ERIC (2)
- Consortium of European Social Science Data Archives (1)
- EDINA, University of Edinburgh (1)
- ENVRI (1)
- University College London (1)

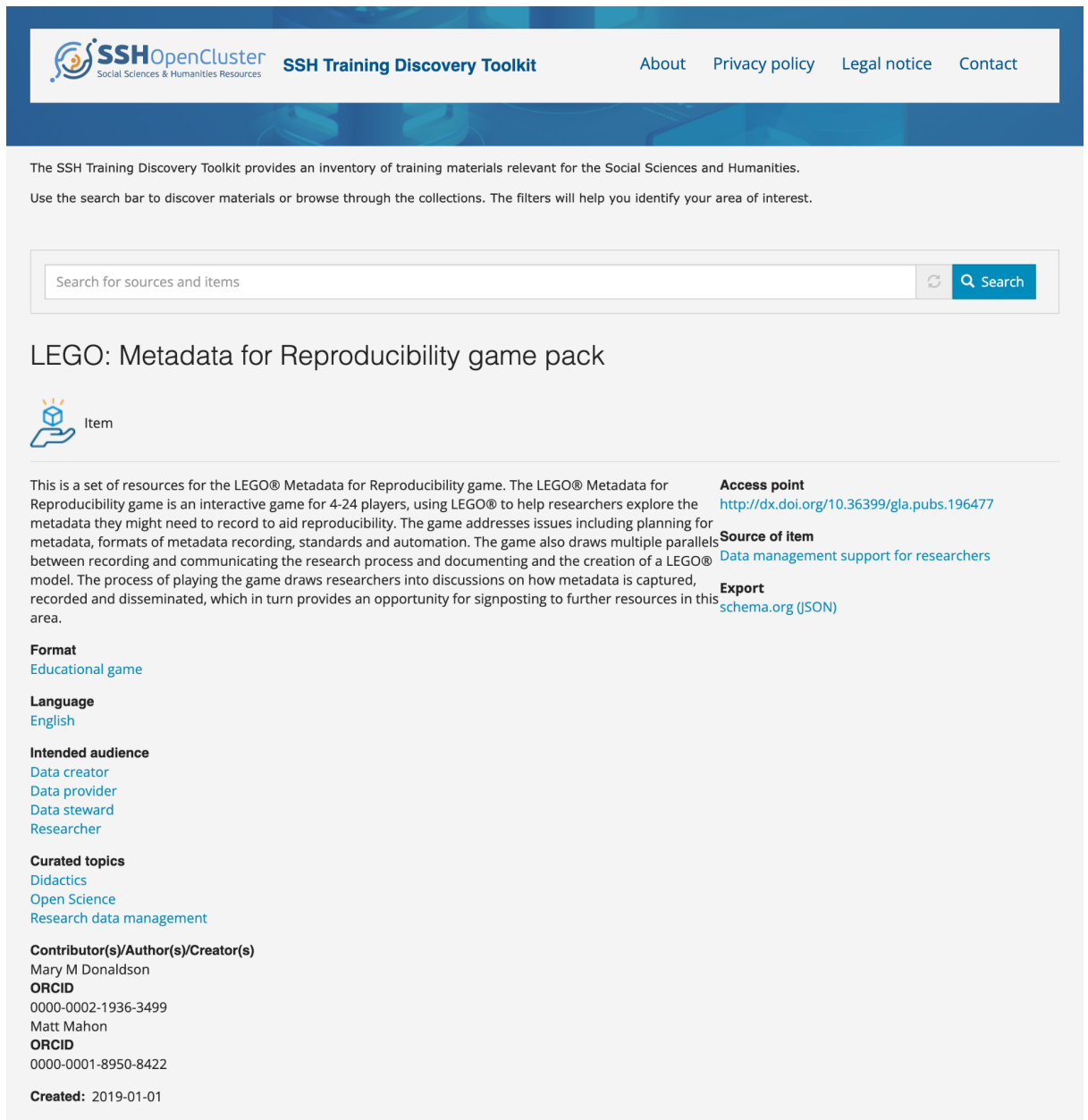
Intended audience

- Researcher (18)
- Data steward (14)
- Data creator (10)
- Data provider (8)
- Student (6)
- Service provider (5)
- Trainer (5)

Language

- English (15)
- en (5)
- de (1)
- el (1)
- Italian (1)
- nl (1)
- Slovenian (1)


*T4.3 Appendix 3 Figure 2: SSH Training Discovery Toolkit, with the first search results for the free text search for “metadata”. Some of the filtering options are visible to the right.*



The SSH Training Discovery Toolkit provides an inventory of training materials relevant for the Social Sciences and Humanities. Use the search bar to discover materials or browse through the collections. The filters will help you identify your area of interest.

Search for sources and items

### LEGO: Metadata for Reproducibility game pack

 Item

This is a set of resources for the LEGO® Metadata for Reproducibility game. The LEGO® Metadata for Reproducibility game is an interactive game for 4-24 players, using LEGO® to help researchers explore the metadata they might need to record to aid reproducibility. The game addresses issues including planning for metadata, formats of metadata recording, standards and automation. The game also draws multiple parallels between recording and communicating the research process and documenting and the creation of a LEGO® model. The process of playing the game draws researchers into discussions on how metadata is captured, recorded and disseminated, which in turn provides an opportunity for signposting to further resources in this area.

**Access point**  
<http://dx.doi.org/10.36399/gla.pubs.196477>

**Source of item**  
[Data management support for researchers](#)

**Export**  
[schema.org \(JSON\)](#)

**Format**  
[Educational game](#)

**Language**  
[English](#)

**Intended audience**  
[Data creator](#)  
[Data provider](#)  
[Data steward](#)  
[Researcher](#)

**Curated topics**  
[Didactics](#)  
[Open Science](#)  
[Research data management](#)

**Contributor(s)/Author(s)/Creator(s)**  
Mary M Donaldson  
**ORCID**  
0000-0002-1936-3499  
Matt Mahon  
**ORCID**  
0000-0001-8950-8422  
**Created:** 2019-01-01

T4.3 Appendix 3 Figure 3: Item record in the SSHOC SSH Training Discovery Toolkit, showing several of the metadata fields. Screenshot of <https://training-toolkit.sshopencloud.eu/item/347>

SSHOC Open Marketplace, training part

**URL:** <https://marketplace.sshopencloud.eu/search?categories=training-material>

**Summary:** The SSHOC Open Marketplace is a discovery portal contains tools & services, training materials, publications, datasets, and workflows. It aggregates a selection of “useful and well curated” resources and forms a catalogue of these. It is

not a repository, nothing is hosted here, and there are no datasets. Currently (March 2023), metadata of training materials from four main, trusted sources are aggregated: The Programming Historian, DARIAH-CAMPUS, CESSDA, SSK Zotero Resources.

**Target group / audience:** The Social Sciences and Humanities community.

**Type of content:** Domain-specific: social sciences and humanities. Mostly focusing on data analysis, data management, data discovery, and data preservation.

**Learning resource types:** Various. Tutorials, lessons, didactic resources. As documents, web pages, videos, etc.

**Training Resources Metadata:** See the data model.<sup>11</sup> Generally: Title; Description; URL to resource; Access - Licence; Categorisation - Activity; Categorisation - Keyword; Categorisation - Language; Author; Source; Links; Last modified date; Information contributors.

**Training Resources Licence and Access:** The items are licensed as decided by the source. The metadata is openly available under a CC BY licence. The licence can be indicated in the metadata.

### **Training events**

**Summary:** SSHOC workshops and webinars and train-the-trainer bootcamps were organised during the lifetime of the project.

**Events page URL:** <https://sshopencloud.eu/training/training-events>

**Type of training:** Face-to-face workshop; online workshop; webinar. Conferences were also organised.

**Access:**

**Metadata:**

**Management:** The training was organised by one of the project's work packages and the partners in this work package.

**Business model:** SSHOC started as a project (2019-2022) and is currently (2023) maintained by DARIAH, CESSDA, and CLARIN and some of their national nodes, and more funding is applied for.<sup>12</sup>

**Availability of produced resources:** After each event, the presentation slides, video recordings and/or a post-event report were posted on the events page.

## 3. Archaeology Data Service

**D2.1 #:** 8.7

**D2.1 Type:** Documentation Centre on Cultural Heritage

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<sup>11</sup> Matej Ďurčo, Laure Barbot, Klaus Illmayer, Sotiris Karampatakis, Frank Fischer, Yoann Moranville, Joshua Tetteh Ocansey, Stefan Probst, Michał Kozak, Stefan Buddenbohm, & Seung-Bin Yim. (2021). 7.2 Marketplace – Implementation (v1.0). Zenodo. <https://doi.org/10.5281/zenodo.5749465>

<sup>12</sup> See for example

<https://www.huygens.knaw.nl/en/sshoc-nl-infrastructure-is-awarded-15-2-million-euros/>

**Organisation website:** <https://archaeologydataservice.ac.uk/>

**Short description:** The Archaeology Data Service is the UK repository for archaeology and heritage. They also provide help and guidance, as a section on their website pointing to different topics like ‘Instructions for Depositors’, ‘Data Management’, but also for example ‘Guides to Good Practice’ and ‘Teaching resources’.

**Training URL:** <https://archaeologydataservice.ac.uk/help-guidance/>

**Target group / audience:** archaeology professionals; academic data creators (archaeology); archaeology bachelor and master students.

**Type of content:** Domain-specific (archaeology, heritage, and repository-focused); data management; instructions for depositors; accessing and reusing the data in the repository; grant application advice; guides to good practice in archaeology and heritage (also including data management). Course topics include data management planning, FAIR principles, archive deposition, metadata, vocabularies, data selection and retention, digital preservation, and digital publication.

#### **ADS online learning resources**

**Learning resources:** Archaeology Data Service and the related Internet Archaeology make available archives and publications for primary and secondary education as well as learning resources for educators and students:

<https://archaeologydataservice.ac.uk/help-guidance/teaching-resources/archives-for-teaching/>. They do not aggregate external resources. They are available as links to project archives on different topics, which then contain a ‘Schools Resources’ section, generally as a PDF. For university students there is one resource on research data management, but it dates to 2011.

**Learning Resources Metadata:** The learning resources themselves do not have structured metadata, only a free-text description. Metadata like the author is included in the general project metadata. As such, the learning resources are not searchable.

**Learning Resources Licence and Access:** The online resources are specifically meant for reuse by educators and are available free of charge.

#### **ADS workshops**

**Summary:** The ADS works with partners to provide “continuing professional development workshops and courses for heritage environment practitioners and the wider digital preservation community”, like academic data creators and students.<sup>13</sup> This can cover topics like data management planning, FAIR principles, archive deposition, metadata, vocabularies, data selection and retention, digital preservation, and digital publication.

**Events page URL:**

[https://archaeologydataservice.ac.uk/news-events/?news\\_or\\_event=event](https://archaeologydataservice.ac.uk/news-events/?news_or_event=event)

**Type of training:** Face-to-face workshop. (Hybrid symposia are also organised)

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<sup>13</sup> <https://archaeologydataservice.ac.uk/help-guidance/continuing-professional-development/>

**Access:** unclear, the website states that if you are interested, you should contact ADS for more information.

**Metadata:** No structured metadata; the title, date, description, aims and objectives, and programme/agenda are given as free-text.

**Management:** Organised by ADS and/or partners.

**Business model:** Unclear.

**Availability of produced resources:** Mostly not made available but some resources from past events are available online, like google docs or PDFs.<sup>14</sup> These are available as links on the event page, without structured metadata.

#### 4. ARIADNEplus Training Hub

**D2.1 #:** N/A

**D2.1 Type:** Documentation Centre on Cultural Heritage

**Organisation website:** <https://ariadne-infrastructure.eu/>

**Short description:** Project, and now legal entity, integrating archaeological data infrastructures in Europe (see the ARIADNE portal<sup>15</sup>). The Training Hub provides online resources, produced by project precursor PARTHENOS and project partners like DANS and ADS, but also linking to a selection of relevant external resources. The online hub is divided into eight topics (plus “other useful resources”), each linking to a number of resources. There are also links to videos of webinars that were done as part of the ARIADNEplus project, which has now finished.

**Training URL:** <https://training.ariadne-infrastructure.eu/>

**Target group / audience:** archaeological researchers and practitioners

**Type of content:** Domain-specific (archaeology). Applying open/the FAIR principles to archaeology; depositing project datasets in a digital repository; data science skills; managing datasets from large archaeological projects; managing a digital repository of archaeological data; metadata and vocabularies for archaeological datasets; defining and implementing a Data Management Plan; Working with Research Infrastructures.

##### **ARIADNEplus Training Hub**

**Learning resources:** Links to online training modules (text plus video, self-paced), presentation videos, booklets & guides, webinars, online tools, online tutorials, training resources directories.

**Learning Resources Metadata:** No structured metadata, but some information is given: title; description; source; level; URL to resource.

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<sup>14</sup> e.g.

[https://cpb-eu-w2.wpmucdn.com/blogs.bristol.ac.uk/dist/d/449/files/2022/10/UoB\\_Theatre\\_Collection\\_Booksprint-Starting\\_with\\_3D\\_Data\\_Final.pdf](https://cpb-eu-w2.wpmucdn.com/blogs.bristol.ac.uk/dist/d/449/files/2022/10/UoB_Theatre_Collection_Booksprint-Starting_with_3D_Data_Final.pdf)

<sup>15</sup> <http://portal.ariadne-infrastructure.eu/>

**Learning Resources Licence and Access:** Determined by the provider, the selection was based, however, on the resources being open and free to use. The ARIADNEplus-produced material is open and free.

#### **ARIADNEplus workshops**

**Summary:** Face-to-face training could not take place due to the COVID-19 pandemic, but webinars were organised by the project partners.

**Events page URL:** <https://ariadne-infrastructure.eu/category/events/>

**Type of training/learning:** webinar; online workshop.<sup>16</sup>

**Access:** Freely available (registration required to receive the Zoom link).

**Metadata:** No structured metadata. Free-text information like the title, date, description, and programme are available on the events page.

**Management:** Organised by individual project partners.

**Business model:** Project-based funding.

**Availability of produced resources:** The webinar videos have been made available through YouTube.

## 5. CARARE Training Hub

**D2.1 #:** 8.11

**D2.1 Type:** Documentation Centre on Cultural Heritage

**Organisation website:** <https://www.carare.eu/en/>

**Short description:**

**Training URL:** <https://pro.carare.eu/en/training-hub/>

**Target group / audience:** members, data partners, and practitioners in the digital archaeological and architectural heritage

**Type of content:** Divided into five main topics: metadata and vocabularies; working with CARARE services; 3D and virtual reality; content management systems and repositories; copyright, access permissions and the FAIR principles.

#### **CARARE Pro Training Hub**

**Learning resources:** CARARE-produced: Some materials (PDFs) hosted in the Training Hub and downloadable; some materials (slides; video recordings) published through slideshare and Vimeo; link to gitbook (guidelines), linked YouTube videos of training modules. External (?): links to tutorial on Sketchfab,

**Learning Resources Metadata:** There is no structured metadata. For each research at least the title is given in the Training Hub, and usually also the author(s), their organization, a description, and if relevant the date at which the presentation was originally given.

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<sup>16</sup> Examples: <https://ariadne-infrastructure.eu/workshop-semantic-mapping-of-excavation-data/>;  
<https://ariadne-infrastructure.eu/dans-data-trail-workshop-explore-new-tools-for-your-fair-toolkit/>

**Learning Resources Licence and Access:** The materials are freely accessible; for (so far) one external resource registration is required, the rest are completely open. There is full copyright on the resources so they cannot be reused without requesting permission.

### **CARARE training**

**Summary:** CARARE runs training workshops and organises webinars.

**Events page URL:** <https://www.carare.eu/en/events/> (for relevant events, not just CARARE events).

**Type of training/learning:** Webinar; face-to-face training workshop. (also hybrid conferences)

**Access:** Webinars and conferences by registration, free; Training workshops unknown.

**Metadata:** No standardised metadata. The information includes the title; dates; mode; and a description.

**Management:** Organised by the organisation with project partners?

**Business model:** Project-based funding.

**Availability of produced resources:** PDFs of training materials developed for workshops available in the training hub (so far for one workshop); PDFs of slides and links to webinar videos are available in the Training Hub.

## 6. TeSS: ELIXIR's training portal<sup>17</sup>

**D2.1 #:** N/A

**D2.1 Type:** Research Infrastructure

**Organisation website:** <https://elixir-europe.org/>

**Short description:** ELIXIR is a distributed infrastructure that brings together life science resources from across Europe, including databases, software tools, cloud storage, supercomputers, and training materials. For the latter, there is an online training portal, TeSS (Training eSupport System), where (metadata of) life science training materials and training courses are gathered. TeSS consists of three main services: face-to-face and online training (events), training resources (materials), and training workflows or pathways.

**Training URL:** <https://tess.elixir-europe.org/>

**Target group / audience:** Trainers and researchers.

**Type of content:** Domain-specific: Life Sciences; but generic content on research data management, Open Science, and FAIR also available.

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<sup>17</sup> Niall Beard, Finn Bacall, Aleksandra Nenadic, Milo Thurston, Carole A Goble, Susanna-Assunta Sansone, Teresa K Attwood, TeSS: a platform for discovering life-science training opportunities, *Bioinformatics*, Volume 36, Issue 10, 15 May 2020, Pages 3290-3291, <https://doi.org/10.1093/bioinformatics/btaa047>



### **TeSS - Materials**

**URL:** <https://tess.elixir-europe.org/materials>

**Description:** Training resources that can be accessed at any time. Collected from 65 providers.

**Learning resources Types:** Online tutorials, videos, slides, recorded webinars, and more.

**Learning Resources Metadata:** Structured metadata which can be used for filtering. The Bioschemas profiles TrainingMaterial is followed.<sup>18</sup> Metadata attributes are: Title; Description; Objectives; Licence; Keywords; Target audience; Resource type; Content provider; Data added; Scientific topic; Operation; Tool; Standard database or policy; Difficulty level; Author; Contributor; Related resource; Node; Collection; URL to resource.

**Learning Resources Licence and Access:** The metadata on TeSS are open. Access and licence of the material depend on the provider (they normally also are open).

### **TeSS - Events**

**Events page URL:**

**Description:** Events from 71 content providers are provided in the TeSS events register. These are in principle synchronous and can be face-to-face or online, but conferences are also registered in the events catalogue.

**Type of training/learning:** Online and face-to-face workshops and courses; webinars. Conferences are also noted.

**Access:** Depending on the provider, most events appear to be free, but eligibility criteria and maximum numbers of participants often apply.

**Metadata:** Standardised metadata. For events that are courses the Bioschema profiles CourseInstance and Course are used and for other events the Bioschema profile Event is used.<sup>19</sup> Metadata attributes are: Title; Content provider; Nodes; Event type; URL to event; Start date; End date; Timezone; Description; Organizer; Eligibility; Credit/Recognition; Cost basis; Keyword; Scientific topic; Operation; Tool; Venue; City; Country; Sponsor; Target audience; Date added.

**Management:** Organised by the other organisations.

**Business model:** The training events are funded by the organisers. TeSS has been funded by the European Commission, ELIXIR, and the BBSRC UK. TeSS has a separate team but is helped by the ELIXIR technical staff and Training Coordinators group. TeSS provides the platform, the providing organisations are the ones producing the materials and organising the training events.

**Availability of produced resources:** Depending on the providers.

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<sup>18</sup> <https://bioschemas.org/profiles/TrainingMaterial/1.0-RELEASE>

<sup>19</sup> See <https://tess.elixir-europe.org/about/registering> for links.

## T4.3 Appendix 4

# Initial review of digital heritage training

# 4CH Initial review of digital heritage training

Authors: Kate Fernie (CARARE) and Pascal Flohr (KNAW-DANS)

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## United Kingdom (UK)

**IHBC** – Self starter in conservation <https://www.ihbc.org.uk/selfstarter/>

**IHBC** – Recognition of courses by IHBC [https://ihbc.org.uk/learning/recog\\_ihbc/index.html](https://ihbc.org.uk/learning/recog_ihbc/index.html)

Full recognition of a course by the Institute confirms that the course achieves a standard that should allow its graduates to satisfy IHBC membership criteria, where supplemented by a suitable balance of professional experience.

- Course Leaders submit their course syllabus to the Institute for formal recognition.
- The syllabus will be assessed in terms of the eight competencies required for membership:
  - Professional area – (1) Philosophy (2) Practice
  - Evaluation area – (3) History (4) Research, Recording and Analysis
  - Management area – (5) Legislation and policy, (6) Finance and economics
  - Intervention area (7) Design and presentation (8) Technology
- A summary of how those competences are addressed within the syllabus also must be submitted, together with any other relevant supporting information (e.g. membership of IHBC by contributors, etc.)
- Where a course achieves recognition, publicity must clearly reflect the standing of the course with the IHBC, and copies (electronic or otherwise) of all core publicity should be passed to the Director.

**Historic England – training and skills development** <https://historicengland.org.uk/services-skills/training-skills>

- Historic Environment Local Management HELM webinar
- Technical Tuesdays: Technical Building Conservation webinars
- Climate Friday: Climate Change and Cultural Heritage webinars
- E-Learning modules
  - Understanding and managing world heritage sites
  - Unlocking historic buildings
  - Heritage crime
  - Heritage values
  - Inclusive environments
- Heritage Apprenticeships
- Work based training

### Chartered Institute for Archaeologists

- E-Learning portal: <https://www.archaeologists.net/elearning>
  - Professionalism in historic environment practice
  - Making sense of the planning system
  - Planning your career – understanding personal development plans and CPD
  - Everyday ethics – an introduction to professional ethics
- Training courses, workshops and events: <https://www.archaeologists.net/development/training>
  - CifA special interest and area groups
  - Annual conference and training event
  - CifA approved training courses (currently on OASIS)

### Royal Institute of British Architects (RIBA)

- CPD is obligatory for RIBA chartered members
  - [RIBA Academy learning portal](#) CPD core curriculum:
    - Architecture for social purpose
    - Health, safety and well being
    - Business, clients and services

- Legal, regulatory and statutory
- Procurement and contracts
- Sustainable architecture
- Inclusive environments
- Places, planning and community
- Building conservation and heritage. Topics include
  - Making history matter: the politics of physical heritage
  - Conservation as a multidisciplinary process
  - Conservation course webinar series
  - Rescue and reuse: the rise of community-led approaches
- Design, construction and technology
- Ribacpd.com <https://www.ribacpd.com/> free and online courses

#### **Chartered Institute of Architectural Technologists (CIAT)**

- CPD register of courses: <https://architecturaltechnology.com/education/cpd/cpd-register.html>
  - BIM (various courses)
    - All about BIM, 3 free modules: <https://architecturaltechnology.com/education/cpd/cpd-register/all-about-bim-level-2-films.html>
  - Environment: achieving zero carbon; climate change; sustainable built environment; etc
  - Building Regulations
  - Fire
  - Other
    - Controlling buildings digitally – how the correct deployment of a digital system can dramatically enhance the overall end user experience, and how a building manager can get better control over energy usage.

#### **Chartered Institution of Building Services Engineers (CIBSE)**

- Training topics: mechanical services; electrical services; energy efficiency; digital engineering; facilities management; fire safety; lighting; water services and public health; project management; energy assessor training.

#### **Institute of Conservation (ICON)**

- Training Directory: <https://www.icon.org.uk/training/conservation-training.html> (university courses and apprenticeships)
- CPD: <https://www.icon.org.uk/training/cpd.html>
  - Development Route map
  - 5 key standards:
    - Assessment of Cultural Heritage
    - Conservation options and strategies
    - Conservation measures
    - Organisation and management
    - CPD plus professional judgement and ethics

#### **Institute of Civil Engineers**

- Professional development training: <https://www.ice.org.uk/careers-and-training/professional-development-training> Disciplines:
  - Professional Practice

- Accreditation for Project Managers; Supervisors; Service Managers
- Professional qualification training:  
<https://www.ice.org.uk/careers-and-training/professional-qualification-training>

#### **Institute of Structural Engineers**

- Initial professional development (IPD)
- Continuing professional development (CPD) (30+ hours per year is required)
  - Business Practice – topics include clients; financial fundamentals; business skills for engineers; intellectual property; expert witness; moving into engineering management

#### **Landscape Institute**

- Education / CPD: <https://www.landscapeinstitute.org/education/> (35 hours per year is required)
- Professional development (members area) – national and local events, webinars, online case study library, technical resources, library and archive.

#### **Royal Institution of Chartered Surveyors**

- Training and events: <https://www.rics.org/uk/training-events/>
  - Courses can be filtered by CPD hours
  - Professional development packages for an annual subscription

#### **Archives and Records Association UK & Ireland:** <https://www.archives.org.uk/training.html>

- Training
  - Records and Information Governance
  - CPD training and development programme (members only)

#### **Heritage Digital** <https://charitydigital.org.uk/heritage-digital>

Project supported by National Lottery Heritage Fund Digital Skills for heritage funding stream to offer free digital skills training.

- Streams
  - Digital marketing strategy
  - Digital Communications
  - Digital Rights
  - Digital Technology
- Events
- Resources: <https://charitydigital.org.uk/resources>
  - Digital Guide to choosing a CRM for heritage organisations
  - Digital template: social media guidelines
  - Digital Guide: Heritage Organisations and exceptions to copyright
  - How to run effective heritage webinars
  - User generated content: how to engage your audience in creating and sharing content
  - Heritage Preservation, storytelling and online access
  - Digital strategy for heritage: what, why and how
  - A beginner's guide to digital technology for the heritage sector
  - Frequently asked questions about data protection
- Lightning talks from heritage experts
- Articles

### Rebuilding Heritage

A UK-wide support programme funded by the National Lottery Heritage Fund to help heritage sector responses to COVID-19 <https://rebuildingheritage.org.uk/>

### Historic Environment Forum <https://historicenvironmentforum.org.uk/>

- Capacity Building working group: <https://historicenvironmentforum.org.uk/heritage-2020/heritage-2020-working-groups/working-groups-capacity-building/> Statutory duties and apprenticeships
- Constructive Conservation and Sustainable Management <https://historicenvironmentforum.org.uk/heritage-2020/heritage-2020-working-groups/working-groups-constructive-conservation-and-sustainable-management/> Strategy and activity mapping

### Media Trust <https://mediatrust.org/>

- Training programmes and events
  - Digital summer school – a free three-week online programme on how to inspire, engage and mobilise your audience. Gives access to free guides, webinars, toolkits, digital mentoring and wellbeing activities.
  - Media training for Climate advocates
- Resource hub <https://mediatrust.org/communications-support/resource-hub/> Materials in various formats (podcasts, articles, e-learning modules, webinars, videos etc.) and on various topics including
  - Accessibility
  - Content
  - Digital fundraising
  - Digital leadership

### Charity Digital <https://charitydigital.org.uk/>

- Various resources including podcasts and webinars

### Digital heritage lab <https://www.a-m-a.co.uk/digital-heritage-lab/>

- Resources on: <https://www.culturehive.co.uk/digital-heritage-lab/>
  - Case studies
  - Webinars and films
- Online workshops created resources on:
  - Digital fundraising
  - Digitising collections
  - Digital audience development
- MicroDigital: short course for small organisations to improve online and digital marketing

### XpoNorth

- Digital Heritage Workshops <https://xponorth.co.uk/news/xponorth-announces-digital-heritage-workshops-bringing-museums-to-the-home>

### Gloucestershire Heritage Hub

- Online training <https://www.heritagehub.org.uk/heritage-hub-online-training/>
  - Collections Care training
  - Collections Management training
  - Digital preservation training – how to preserve your community or family archive

**SPAB** <https://www.spab.org.uk/learning>

Society for the Protection of Ancient Buildings delivers hands-on workshops, masterclasses, seminars, lectures and short courses across the UK and overseas, and webinars online:

- Conserving Irish Vernacular houses (10 lecture online series)
- Photographing Old Buildings Online Workshop
- Living with your old house
- Repair of Old buildings
- Etc

**Summary of Education and Training** by Matthew Slocombe of SPAB

<https://heritagehelp.org.uk/index.php/conserving/training>

**West Dean college**

<https://www.westdean.org.uk/study/short-courses/courses?category=Conservation&subcategory=Building+conservation+masterclass&tutors=&level=&month=&duration=> Extensive range of 3 and 4 day courses on various aspects of building conservation

**Historic Buildings Council (Northern Ireland)** <https://www.communities-ni.gov.uk/articles/historic-buildings-council>

**Council on Training in Architectural Conservation (COTAC)** <https://cotac.global/>

education and training of all those involved in the protection and preservation of the historic environment that is of cultural, architectural or historical value, and to provide knowledge in support of training and education in the arts and skills required to protect and preserve it.

- COTAC learning – downloadable ‘Insight series’ Understanding conservation
- COTAC studies
  - Integrating Digital Technologies in support of Historic Building modelling <https://cotac.global/COTACstudies/study1/>
  - Fire and Flood in the Built environment
  - BIM4C integrating HBIM framework report <https://cotac.global/COTACstudies/study3/>
  - Websearch list of UK & RoI Heritage courses 2020
    - Architectural Conservation Courses
    - Courses offered with Architectural Conservation Modules
    - Architectural Technology (Conservation not specified)
    - Heritage Courses (Not necessarily Architectural)
  - <https://cotac.global/courses/short/>
- HBIM papers <https://cotac.global/hbim/>

**Understanding Conservation:** <http://www.understandingconservation.org/>

Website offering an educational resource comprising of units based on ICOMOS education and training guidelines:

- *Unit 1 Cultural Significance:* This Unit focuses on informing the practical and pragmatic substance of conservation work by integrating a detailed consideration across 10 of the 14 ICOMOS guidelines.
- *Unit 2 Aesthetic qualities and values:* This Unit focuses on contextualising the wider visual conservation issues of place and performance in use within a philosophical understanding
- *Unit 3 Investigation, materials and technology:* This Unit focuses on how to obtain relevant information across a wide range of technical parameters to aid effective decision making whilst acknowledging the substance of the asset.



- *Unit 4 [Social and financial issues](#)*: This Unit enhances the understanding developed in the previous three Units and contextualises that with the recognition of reaching a satisfactory conclusion with all the pertinent parties.
- *Unit 5 [Implementation and management of conservation works](#)*: This Unit restates the importance of operating with a philosophical and ethical understanding of conservation issues, and to advise effectively relevant current and future needs.

**The Survey Association (TSA)** – the trade body for commercial survey companies in the UK.

- The Survey School: <https://www.tsa-uk.org.uk/training/the-survey-school/> A commercial training centre accredited by the Chartered Institution of Civil Engineering Surveyors. Practical survey training and short courses.
- Info about external training including for example
  - GPR data post-processing: <http://www.bluehatservices.co.uk/training-courses/gpr-data-post-processing/>
- Client guides – provide a guide to topics aimed at ‘other professionals’ <https://www.tsa-uk.org.uk/downloads/> topics include:
  - Satellite Imagery Survey
  - Photogrammetry
  - Offshore Satellite Imagery Survey
  - Measured building survey
  - Digital orthophotography
  - Mobile LIDAR surveys
  - Aerial LIDAR surveys
  - Achievable accuracies from Aerial Photogrammetric Systems
  - Small Unmanned Aircraft surveys
  - Terrestrial laser scanning
  - Topographic surveys
  - Close range photogrammetric accuracies
  - Etc.

**Blue Hat training and consultants** <http://www.bluehatservices.co.uk/>

A recognised provider of specialist GPR and utility-mapping training courses delivered worldwide.

**DigVentures** <https://digventures.com/courses/>

Offers courses (for subscribers) which are approved by the Chartered Institute for Archaeologists including

- How to do photogrammetry

**Museum of London training programmes**

<https://www.museumoflondon.org.uk/supporting-london-museums/training-and-skills>

- Skills Plus training programme. Post pandemic delivered online with sessions relevant for the current situation such as:
  - Planning for Reopening, Agile for Museums, Planning for Alternate futures
  - Creating a Family Friendly environment
- Digital Futures training programme. Post pandemic delivered online with sessions relevant for the current situation such as:
  - Social Media, Editing Videos, Creating 3D models of your collections

## Republic of Ireland

**Register of Heritage Contractors** <https://heritageregistration.ie/> Provides information about accredited contractors and includes details of courses and events.

Training listed includes:

- Conserving your Dublin Period house
- Leadwork for Historic buildings CPD course
- Dún Laoghaire- Rathdown Historic houses course
- Conservation theory for heritage contracting
- Etc

**Heritage Ireland** <https://heritageireland.ie/>

**Office of Public Works** <https://www.gov.ie/en/organisation/office-of-public-works/>

**Heritage Council** <https://www.heritagecouncil.ie/>

Links to various videos and materials: <https://www.heritagecouncil.ie/advice-and-guidance/traditional-building-skills>

**Irish Georgian Society** <https://www.igs.ie/>

Conservation Education Events listing: <https://www.igs.ie/events/list/category/conservation-education>

**Technical University in Dublin**, School of Architecture covers architectural technology.  
<https://www.dit.ie/architecture/findacourse/cpd/> Offers CPD courses in:

- Digital Delivery for Site teams
- nZEB policy and technologies
- Energy modelling using PHPP
- Hygrothermal risk assessment

### **Construction Industry Federation**

One day course on conservation theory for heritage contracting:

<https://ciftraining.ie/product/cif-conservation-theory-heritage-contracting/>

**Institute of Conservator-Restorers in Ireland (ICRI)** <https://www.icriconservation.ie/>

Events and training – archive covers a range of topics:

- Project management for conservation projects
- Nanoscience for conservators
- Introduction to using environmental data to improve collection care
- Etc.

**National Inventory of Architectural heritage** <https://www.buildingsofireland.ie/resources/>

## the Netherlands

**Netwerk Digitaal Erfgoed** <https://netwerkdigitaalerfgoed.nl/>

mostly in Dutch

Connecting heritage institutions: KNAW Humanities Cluster, Koninklijke Bibliotheek, Nationaal Archief, Beeld & Geluid, Het Nieuwe Instituut en Rijksdienst voor het Cultureel Erfgoed. Also involved in E-RIHS.nl.

- In-person training events
- Erfgoedtoolkit (“heritage toolkit”)
  - mostly tools, guidelines, background information
  - course: Winter School for Audiovisual Archiving
  - course: Management Programme Digital Strategy and Innovation

**E-RIHS.nl** <https://e-rihs.nl/>

- Connecting cultural heritage organisations in the Netherlands.
- In person courses (in Dutch):
  - Leren Preserveren (“Learn to Preserve”) (4 day in-person training, July 2022, with DANS, NDE, VHIC Faculty, materials do not appear to be online)
  - Workshop metadata(standaarden) voor FAIR erfgoedonderzoek (“Workshop metadata (standards) for FAIR cultural heritage research”) (March 2023, DANS, NDE, VHIC Faculty, in person training).

**DANS** [www.dans.knaw.nl](http://www.dans.knaw.nl)

Research Data Repository with a dedicated Archaeology (=all cultural heritage) Data Station and relevant training. In-person training workshops, DANS Data Trail webinars. Training materials in the process of being made available online, likely to include relevant materials about all aspects of **research data management** and **FAIR data**.

- DANS Data Trail webinar videos on YouTube <https://www.youtube.com/@DANSDataArchiving>, includes cultural heritage-specific webinars (some in Dutch, most in English).
- DANS Zenodo community: <https://zenodo.org/communities/dans-knaw-training/?page=1&size=20>
- Some DANS training materials are present in the SSHOC Training Toolkit / Marketplace: <https://training-toolkit.sshopencloud.eu/source/225> (but generic, not specifically about heritage).

### RDNL

A collaboration between DANS, 4TU, SURF, and DTL

- Essentials 4 Data Support <https://datasupport.researchdata.nl/en/>. An introduction to research data management aimed at data stewards. The materials are openly available online.

**CLARIAH** <https://www.clariah.nl/learn>

“CLARIAH develops, facilitates and stimulates the use of Digital Humanities resources and infrastructures.” “In addition to tools and datasets, CLARIAH will also create instructional and educational material for use by researchers and digital humanities teachers.”

- Some resources are available (<https://www.clariah.nl/clariah-resources-overview>) but no learning resources, and nothing particularly relevant for cultural heritage as yet (February 2023).

**Nederlands Instituut voor Kunstgeschiedenis (RKD)**

Dutch Institute for Art History

- In-person master classes in Dutch <https://rkd.nl/nl/diensten-en-producten/rkd-masterclasses>. Mostly specific art history topics (sources, checking if a artwork is real) but also for example on the AAT.

**University of Leiden, Faculty of Archaeology**

- Programmes in Archaeology, including heritage management and [Digital Archaeology](#) as a specialisation.
- Two free MOOCs:
  - [Heritage under Threat](#)
  - [Osteoarchaeology: The Truth in our Bones](#)

**University of Amsterdam (UvA)**

- Conservation and restoration  
<https://www.uva.nl/en/discipline/conservation-and-restoration/conservation-and-restoration.html>
  - Study programme:  
<https://www.uva.nl/en/discipline/conservation-and-restoration/education/education.html>

## Europe

### European Research Infrastructure for Heritage Science (E-RIHS) <http://www.e-rihs.eu/>

E-RIHS plans a comprehensive programme of educational activities including training events, short workshops, CPD courses, hands-on experience of the functioning of its platforms, training camps, summer schools, and liaising with other educational and training institutions.

- HS Academy links to IPERION HS website

### IPERION HS

The IPERION HS consortium is determined to take up the challenge outlined in the Horizon 2020 for European research infrastructures, which calls for the establishment of a unique European research infrastructure for Heritage Science. Heritage Science is the interdisciplinary domain of scientific study of heritage. Heritage Science draws on diverse humanities, sciences and engineering disciplines.

- HS Academy <https://www.iperionhs.eu/academy-events/>
  - Doctoral summer school(s)
  - Onsite training camp (functioning of the MOLAB platform) - advanced mobile analytical instrumentation for non-invasive measurements on precious, fragile or immovable objects, archaeological sites and historical monuments.
  - Monthly Webinar series
    - Heritage Science and IPERION HS
    - Paleolithic Ivory Research and FIXLAB
    - MOLAB and Islamic Manuscripts
    - ARCHLAB and the Ghent Altarpiece
    - Built heritage research services
    - Arts and Humanities research services
    - Palaeontology Research services
    - Archaeology Research services
  - HS Training modules

### ARIADNEplus training hub: <https://training.ariadne-infrastructure.eu/>

Funded by Horizon 2020 and set to run to December 2020. The themes of the training hub are:

- Applying open/the FAIR principles to Archaeology
- Depositing project datasets in a digital repository
- Data Science Skills
- Managing datasets from large archaeological projects
- Managing a digital repository of archaeological data
- Metadata and vocabularies for archaeological datasets
- Defining and implementing a Data Management Plan (DMP)
- Working with Research Infrastructures

### PARTHENOS training suite: <https://training.parthenos-project.eu/>

Training modules and resources in the digital humanities and research infrastructures includes materials for both trainers and learners. Modules:

- Introduction to Research Infrastructures
- Management challenges in Research Infrastructures
- Introduction to collaborations in Research Infrastructures
- Manage, Improve and Open up your Research data
- Formal ontologies: a complete novice's guide

- Digital Humanities research questions and methods
- Citizen Sciences in the Digital Humanities
- eHeritage Webinars:
  - Create impact with your e-Humanities and e-Heritage research
  - How to work together successfully with e-Humanities and e-Heritage research infrastructures
  - e-Humanities and e-Heritage research infrastructures: Beyond Tools
  - Make it happen – carrying out research and analysing data
  - Boost your e-Humanities and e-Heritage research with Research Infrastructures

**CLARIN/DARIAH Digital Humanities Course Registry** <https://dhcr.clarin-dariah.eu/>

a map-based search environment that gives access to a database that contains information on Digital Humanities courses. It currently covers only (a selection of) DH courses offered by European academic organisations.

**DARIAH-EU** <https://www.dariah.eu/activities/training-and-education/>

Training and education. Promotes skills awareness and development outside of formal qualifications, complementing formal education provided by university partners. The users of training resources are contributors as much as beneficiaries.

- **DARIAH-Campus** <https://campus.dariah.eu/> Resources include:
  - DARIAH-DE Collection registry tutorial
  - Transformation: how the digital creates new realities
  - Using Digital archives for Geographical and Archaeological Research (from DRI)
  - Using Digital Archives for Historical Research (DRI)
  - Using Digital Archives for Social Sciences Research (DRI)
  - Scholarly Primitives 20 years later
  - Flipped Classrooms (TCD)
  - Etc.
- **Digital Humanities course registry:** <https://campus.dariah.eu/course-registry>
- **DARIAH Teach** platform for teaching and training materials

**Digitraining** <https://digitraining-heritage.eu/>

Funded by the Creative Europe Programme Digitraining is set to run to July 2022. Training seems to be accessible only to applicants, and calls are now closed.

After the implementation of the Capacity Building Programme course, the materials and resources should be available for free on the website.

**ITN-DCH** <https://www.itn-dch.net/index.php/about-us/>

Marie Curie fellowship project in the area of e-documentation / e-preservation and CH protection. No resources.

**Digital heritage training for historians in Europe** – <https://doi.org/10.4995/var.2017.4726>

2017 Paper focussing on Spain

**European Heritage Volunteers**

<https://www.heritagevolunteers.eu/en/HeritagePromotionAndEducation/EuropeanHeritageTrainingCourses>

Traditional handcraft techniques, restoration, conservation, documentation.

**Transylvania Trust - Built Heritage Conservation Centre**

<http://www.heritagetraining-banffycastle.org/index.php/en/bhct/built-heritage-conservation-training-centre>

Offers 'hands-on' learning experience in the field of historic building conservation

**The Heritage Management Organisation:** <https://heritagemanagement.org/>

- Digital tools for cultural heritage management – online training programme (in collaboration with HOGENT, Belgium) introduces GIS, photogrammetry and 3D modelling, terrestrial laser scanning. One-month programme May-June 2021:  
<https://heritagemanagement.org/training/summer-schools/digital-tools-for-heritage-management/>
- Engaging communities – online training programme (one month). Covers heritage management and community engagement, ethnographic methods and collaborative research, oral history, going digital (producing and displaying local cultural heritage).  
<https://heritagemanagement.org/training/summer-schools/engaging-communities-in-cultural-heritage-through-festivals/>
- Executive leadership workshops
- Heritage management MA

**HOGENT** - <https://www.hogent.be/en/> University of Applied Sciences and Arts in Flanders.

**J-Story/Jewish History Tours** <https://j-story.jhn.ngo/home>

Jewish Heritage Network, European Association for the Preservation and Promotion of Jewish Culture and Heritage and izi.TRAVEL develop an intensive summer training consisting of 5 online sessions each 1.5 hours long

- **online training** <https://j-story.jhn.ngo/jewish-history-tours-online-training.pdf>
- Introduction to Cultural Storytelling: tools and best practices (or how to promote your first mobile guided tour).

**International**

**The digital heritage manager:** enabling African heritage collections to cross the digital divide:

<http://heritage.africamediaonline.com/>

- Webinars
  - Preparing your material for upload to your digital archive – arrangement, standards and tools
  - Introduction to IIF
  - Working with metadata for your digital archive – offline, online and in spreadsheets
  - Curating your collections digitally – telling stories from your digital archive
- Digital trade route (enabling you to get your analogue or digital collections from where they are currently stored to the audience you want to reach, whether global or local).  
<http://heritage.africamediaonline.com/digital-trade-route/>

**FutureLearn** <https://www.futurelearn.com/>

- Online courses from universities and specialist organisations, various subjects including: Creative Arts & Media, History, IT & Computer Sciences

**Research data management open training materials**

<https://zenodo.org/communities/dcc-rdm-training-materials/?page=1&size=20>

**OER Commons** <https://www.oercommons.org/>

A public digital library of open educational resources.

**ICCROM:** <https://www.iccrom.org/>

Courses: <https://www.iccrom.org/get-involved/courses>

- PREVENT: mitigating fire risk for heritage

- Online training on impact assessments for World Heritage
- Investigation, preservation and management of Archaeological Sites
- Disaster Risk management of cultural heritage (ITC 2021)
- Asian regional course on PEOPLE-Nature-Culture
- MSc programme on Conservation Management of Cultural Heritage (Uni of Sharja, UAE)
- Regional course on cultural heritage first aid, peace and resilience
- Etc.

### The Programming Historian

Peer reviewed tutorials on open access: <https://programminghistorian.org/en/lessons/> Topics include:

- Data management
- Data manipulation
- Linked open data
- etc

**Endangered Archaeology in the Middle East and North Africa project**, Universities of Oxford, Durham, and Leicester, [eamena.org](http://eamena.org)

- Online training materials in archaeological applications of remote sensing, GIS, Arches databases: <https://eamena.org/cpf-training> (no reuse licence indicated). PDF, Excel, and videos.
- MOOC: <https://eamena.org/mooc-1-endangered-archaeology-using-remote-sensing-protect-cultural-heritage>

**CIDOC-CRM** <https://www.cidoc-crm.org/>

- Tutorial (actually a recorded lecture) <https://www.cidoc-crm.org/cidoc-crm-tutorial>

### Sample of University Courses

#### University of Bradford - Landscape Archaeology and Digital Heritage MSc

<https://www.bradford.ac.uk/courses/pg/landscape-archaeology-and-digital-heritage/>

3D methods of digitally documenting objects, sites, and landscapes offer significant potential to archaeology and heritage management. Digital data can be a way of archiving heritage (the need for this has been graphically illustrated by the loss of world heritage sites to conflict) and it is becoming the gold standard for commercial recording of sites and landscapes.

Digital data can be used for a variety of purposes:

- to monitor change for conservation and management
- to investigate and analyse features
- for reconstruction purposes
- to visualise and present the past
- providing new ways of engaging with the public
- providing access to remote sites or inaccessible collections that are otherwise difficult to reach.

This new Masters programme will give you direct hands-on experience of current technologies used for acquisition of data and the manipulation, presentation, and analysis of data captured at all scales.

#### UCL Institute of Archaeology – Digital Heritage: Applications in Heritage Management

<https://www.ucl.ac.uk/archaeology/study/graduate-taught/courses/digital-heritage-applications-heritage-management>





The module introduces students to the latest developments in the use of digital technologies for management of heritage across the world

## Topics

### Data Management

- Big data services

- Data storage

- Data mirroring

- Preservation

- Data archiving

- 3D technologies for monuments and sites

- 3D survey of a building

- 3D capture of artefacts

- BIM modelling

- Semantic technologies for monuments and sites

- Triple stores and semantic databases

- Knowledge management systems (NKOS)

- Linked Data

- Data interoperability

- Metadata

- Cultural heritage metadata

- Data mapping, conversion and transformation

- Thesaurus and vocabularies

- Ontologies

- CIDOC CRM

- Data mining, NLP and NER

- Rights and licencing

### Tools for exploiting 3D digitisation

- Visualisation tools

- Storytelling

- Tourism services

- Community engagement

- 3D printing

- Data re-use

### Heritage management

- Disaster prevention

- 3D monitoring

- remote sensing monitoring

- Ethics

- Policy

- Funding models

- Fundraising

- Sustainability

## Guidance documents

Metric Survey Specifications for Cultural Heritage By David Andrews, Jon Bedford and Paul Bryan. Historic England:  
<https://content.historicengland.org.uk/images-books/publications/metric-survey-specifications-cultural-heritage/metric-survey-specifications-for-cultural-heritage-3rded.pdf/>

The light fantastic: using airborne lidar in archaeological survey  
<http://historicengland.org.uk/images-books/publications/light-fantastic/>

Specialist Survey Techniques  
<http://www.historicengland.org.uk/research/approaches/research-methods/terrestrial-remote-sensing/specialist-survey-techniques>

Airborne Remote Sensing  
<http://www.historicengland.org.uk/research/approaches/research-methods/airborne-remote-sensing/>

Terrestrial Remote Sensing  
<http://www.historicengland.org.uk/research/approaches/research-methods/terrestrial-remote-sensing/>

Measured surveys of land, buildings and utilities 3rd edition RICS professional guidance, global  
<http://www.isurv.com/site/scripts/download.aspx?type=downloads&fileID=6367>

Principles For The Recording Of Monuments, Groups Of Buildings And Sites (1996) Ratified by the 11th ICOMOS General Assembly in Sofia, October 1996.  
<http://www.icomos.org/charters/archives-e.pdf>

Guide for Practitioners 4 -Measured Survey and Building Recording for Historic Buildings and Structure. Historic Scotland 2003  
<http://conservation.historic-scotland.gov.uk/publication-detail.htm?pubid=8564>  
<http://issuu.com/hspubs/docs/guide-for-practitioners-4---measured-survey-and-bu?e=0>

Understanding Historic Buildings: A Guide to Good Recording Practice. Historic England: May 2016  
<https://content.historicengland.org.uk/images-books/publications/understanding-historic-buildings/heag099-understanding-historic-buildings.pdf/>

From BIM to HIM (Heritage Information Management)  
[http://www.autodesk.com/temp/pdf/Architectural\\_Services\\_Department\\_of\\_HKSAR\\_Government.pdf](http://www.autodesk.com/temp/pdf/Architectural_Services_Department_of_HKSAR_Government.pdf)

## References

Building Information Modeling and Heritage Documentation: XXIIIrd International CIPA Symposium

[https://d2f99xq7vri1nk.cloudfront.net/legacy\\_app\\_files/pdf/Fai.pdf](https://d2f99xq7vri1nk.cloudfront.net/legacy_app_files/pdf/Fai.pdf)<https://autodeskresearch.com/publications/heritagedoc>

English Heritage (2006), Understanding Historic Buildings: A guide to good recording practice, English Heritage Publishing

Foxe, D. (2010), 'Building Information Modelling for Constructing the Past and Its Future', Association for Preservation Technology International (APT): APT Bulletin, 41, (4), Special Issue on Documentation, pp. 39-45

Giudice, M. D., Osello, A. (2013), 'BIM for Cultural Heritage', International Archives of the Photogrammetry, Remote Sensing, and Spatial Information Sciences, Volume XL-5/W2; 24th International CIPA Symposium, Strasbourg, France 2-6 September

Jack, A. (2014), Built Heritage Management Systems: The Framework of a Digital Tool for the Conservation of Brisbane City Hall, MSc Applied Science thesis, Queensland University of Technology

Maxwell, I. (2014), Integrating Digital Technologies in Support of Historic Building Information Modelling: BIM4Conservation (HBIM), A COTAC Report, Available: <http://www.cotac.org.uk/index.php>

Murphy, M., McGovern, E., Pavia, S. (2009), 'Historic Building Information Modelling (HBIM)', Structural Survey, 27, (4), pp. 311-327

## T4.3 Appendix 5

# Examples of existing learning resources to be integrated in the 4CH Knowledge Base

Author of spreadsheet: Pascal Flohr (DANS-KNAW)

Version: 20230426 (26 April 2023)

For data model, controlled vocabularies, and mappings, see D4.2 T4.3 Appendix 6.

The document is provided as a spreadsheet.

**Metadata elements based on:**

[RDA Minimal Metadata for Learning Resources](#)

[EOSC Training Resource Profile](#)

[SSHOC Training Discovery Toolkit metadata](#)

**Vocabularies based on:**

[Austrian Fields of Science and Technology Classification 2012](#)

[CEDS Common Education Data Standards - Learning Resource Type](#)

[Creative Commons](#)

[Dublin Core LRMI Learning Resource Type vocabulary](#)

[EOSC Portal Profiles](#)

[\\_ especially the EOSC Training Resource Profile](#)

[EU Vocabularies - Licence](#)

[SSH Open Cloud Vocabs - training resources](#)

# existing learning resources

Title	Abstract / Description	Author	Author ORCID	Organization	Primary Language	Open packages	Version Date	Created Date (original version)	Keywords	Scientific (sub)domain (area)	Training need addressed (see I4.1 section 2.2)	Licence	URL to Resource	Resource URL Type	Access rights	Target Group (Audience)	Target group (specified)	Learning Resource Type	Content resource type (Choose 1 or more from: Animation, Audio, Diagram, Game, Image, Multimedia, Poster, Slide, Text, Video, Website, Other)	Learning Outcomes	Expertise (PDR) Level	Qualification	Duration (min)	Comments
The CIDOC CRM - a Standard for the Integration of Cultural Information	What is multiple version inheritance? You will learn 1) all with metadata, with models of the same CIDOC CRM dataset presentation. The CIDOC Consortium Reference Model (CRM) provides definitions and a formal language for describing the model and explicit concepts and relationships used in cultural heritage documentation. The CIDOC CRM is intended to provide a shared understanding of cultural heritage information by providing a common and controlled semantic framework that any cultural heritage information can be mapped to. It is intended to be a controlled language for common explicit and implicit requirements for information systems and to serve as a guide for good practice of conceptual modelling. In this way, it can provide the semantic glue needed to connect different sources of cultural heritage information, such as that published by museums, libraries and archives.	Stephen Boyd		ICP-FORTH	English (en)		1-11-2006		CIDOC CRM; ontology; cultural heritage; interoperability	Cultural heritage	Data management - Controlled vocabularies, thesauri, ontologies	Unknown	<a href="http://www.cidoc-crm.org/">http://www.cidoc-crm.org/</a>	URL	Open access	Researcher / practitioner	Researchers, data managers, developers	Lesson (plan)	Video, Slide, Audio	Not specified	Beginner	None	20	
Endangered archaeology: Using remote sensing to protect cultural heritage	The Endangered Archaeology in the Middle East and North Africa (EAMENA) project has developed a methodology for documenting heritage sites and landscapes, using remote sensing as a key technique. On the course, you'll learn about the basics of satellite remote sensing and how to use it to identify and monitor threats to heritage sites and landscapes.	Benjamin Watson Dariusz Kozłowski Dorian Phillips Neil Lawrence		EAMENA project: Durham University, University of Leicester	English (en), Persian (fa), French (fr)		2020		satellite sensing, monitoring, documentation, Google Earth Pro, remote assessment, monitoring, satellite imagery, archaeology	Cultural heritage	Data capture - satellite remote sensing; Data processing and analysis - satellite remote sensing	Unknown	<a href="https://www.eamena.org/">https://www.eamena.org/</a>	URL	Open access	Researcher / practitioner	Researchers, cultural heritage professionals	Learning module	Text, Image, Video, Game	Being able to perform basic remote sensing tasks with satellite imaging platforms such as Google Earth Pro. Identify basic archaeological processes that influence the preservation, survival or threat of archaeological sites through satellite imagery, assess threats and damage to heritage sites using remote sensing techniques, create maps using Google Earth Pro.	Beginner	Certification	100	CIDOC course on YouTube.com, fees: 6 weeks of 3 hours each. Links to various basic training videos: landscape archaeology using remote sensing project website
EOS	EOS (satellite video and PDF handbook with exercises) focused on documenting and monitoring cultural heritage, including airphoto and geospatial Corona imagery. Made for the Endangered Archaeology in the Middle East and North Africa (EAMENA) project as part of the British Council CPD funded training programme.	EAMENA team: Durham University, University of Leicester		EAMENA project: Durham University, University of Leicester	English (en)		2020	2020	EOS, remote sensing, Corona imagery, geospatial, archaeology, monitoring	Cultural heritage	Data capture - satellite remote sensing; Data processing and analysis - satellite remote sensing	Unknown	<a href="https://www.eamena.org/">https://www.eamena.org/</a>	URL	Open access	Researcher / practitioner	Cultural heritage professionals, researchers	Lesson (plan)	Video, Text, Image	Not specified	Intermediate	None	1 lesson: 1 EOS video; 2 EOS geospatial maps and Corona imagery; 2 EOS practical exercises	
Google Earth Engine	Google Earth Engine (video and PDF handbook with exercises) focused on monitoring cultural heritage. Made by the Endangered Archaeology in the Middle East and North Africa (EAMENA) project as part of the British Council CPD funded training programme.	EAMENA team: Durham University, University of Leicester		EAMENA project: Durham University, University of Leicester	English (en)		2020	2020	Google Earth Engine, remote sensing, archaeology, monitoring, heritage, GIS	Cultural heritage	Data capture - satellite remote sensing; Data processing and analysis - satellite remote sensing	Unknown	<a href="https://www.eamena.org/">https://www.eamena.org/</a>	URL	Open access	Researcher / practitioner	Cultural heritage professionals, researchers	Lesson (plan)	Video, Text, Image	Not specified	Intermediate	None	1 lesson: Google Earth Engine module: Agriculture and NDVI in Google Earth Engine; Academic Change Detection	
GISY YouTubelike Training Materials	A handbook using PDF documents of presentations and video training materials for the GIS & Archaeology (Thames Valley), the GISY Thematics of Geographic Names (TCGN), the Union List of Artist Names (ULAN), the Cultural Objects Name Authority (CONA), the Getty Vocabulary Authority (GVA), Categories for the Description of Works of Art (CDWA), Category Cultural Objects (CCO), and standards in general. The materials are subject to frequent modification and addition.	The Getty Research Institute The Getty Foundation		The Getty Research Institute	English (en)		2022		semantic analysis, vocabularies, metadata, research data management, Art and Architecture Thesaurus (AAT), CIDOC CRM	Cultural heritage	Data management - Controlled vocabularies, thesauri, ontologies - Controlled vocabularies for cultural heritage; Getty AAT; CIDOC CRM	Unknown	<a href="https://www.getty.edu/research/vocabularies/">https://www.getty.edu/research/vocabularies/</a>	URL	Open access	Researcher / practitioner	Data managers, researchers, research support, cultural heritage professionals	Supporting document	Text, Slide	Not specified	Advanced	None		Overview of PDFs mostly of presentation slides.
CIDOC CRM Game	CIDOC CRM the Game is an open source initiative that aims to promote wider adoption of the CIDOC CRM standard through facilitating the learning process by beginning with a game. The game introduces the CIDOC CRM ontology as a card game consisting of 3 basic decks. There are different scenarios available, which relate to actual cultural heritage. There are training exercises and downloadable digital versions for an online version, see CRMtheGame. The recent is a collective record for five different games, four tabletop versions and one digital version, developed between 2018 and 2021.	George Prinos, Anah Oulman, Chrysiou Chrysiou, Daria Gouli, Marie Perle, Francisca Foster-Salgem		Herio Num MASFA	English (en)		2021		CIDOC CRM; ontology; archaeology; history; conservation; cultural heritage; education	Cultural heritage	Data management - Controlled vocabularies, thesauri, ontologies - CIDOC CRM	CC BY-NC-SA	<a href="https://www.cidoc-crm.org/">https://www.cidoc-crm.org/</a>	URL	Open access	Researcher / practitioner		Activity plan / Learning activity	Game	Initial non-expert to CIDOC CRM general concepts and mapping principles with CIDOC CRM and alternative use(s) in archaeology / cultural heritage / conservation.	Beginner	None		1 website: Access Editor: Cultural heritage, digital cultural heritage, in English; Book and Paper Conservation Edition (Conservation in English); Discussion edition (Archaeology, history in French); Presentation (Archaeology, Digital Cultural Heritage, in French); Digital (Interactable, Archaeology, in English).
CRMtheGame	The online version of CIDOC CRM the Game. It provides pedagogical scenarios adapted to CIDOC learning, but also to data mapping. The scenarios are progressive challenges to first discover the principle of an ontology and how to use it, then to understand the structure of the main branches of the CIDOC CRM and finally to do advanced non-task scenarios again in the form of game decks. CRMtheGame is a fully platform, CRMtheGame is an open system that enables us the fast deployment of a scenario with its background and procedural scenario cards. It is even perfectly possible to integrate players other than the CIDOC CRM. Moreover the game is potentially multi-player and scalable on demand.	Francisco-Javier Vergara, George Prinos, Chrysiou Chrysiou, Marie Perle, Anah Oulman		Herio Num MASFA	English (en)		2020		CIDOC CRM; ontology; archaeology; history	Cultural heritage	Data management - Controlled vocabularies, thesauri, ontologies - CIDOC CRM; Data management - Controlled vocabularies, thesauri, ontologies	Unknown	<a href="https://www.cidoc-crm.org/">https://www.cidoc-crm.org/</a>	URL	Open access	Researcher / practitioner		Activity plan / Learning activity	Game	Initial non-expert to CIDOC CRM general concepts and mapping principles with CIDOC CRM and alternative use(s) in archaeology / cultural heritage / conservation.	Beginner	None		Separation end log is required

# vocabularies

Source per entry: see D4.2 T4.3 Appendix 6

## Scientific (sub)domain

Generic
Cultural heritage
Digital humanities
Cultural management
Archaeology
Art history
Architecture

## Licence

Public Domain
CC0
CC BY
CC BY-SA
CC BY-NC
CC BY-NC-SA
CC BY-ND
CC BY-NC-ND
Full copyright
Other open licence
Other non-open licence
Unknown

## Resource URL type

ARK
DOI
HANDLE
URN
URI
URL
Not applicable

## Access rights

Open access
Restricted access
Metadata only access
Paid access

## Target group (Audience)

Researcher / practitioner
Manager
Policy maker



# vocabularies

## Learning resource type

Activity plan / Learning activity
Assessment
Assessment item
Course
Demonstration/Simulation
e-Learning module
Educator curriculum guide
Lesson (plan)
Physical learning resource
Recorded lesson
Supporting document
Textbook
Unit (plan)
Other

## Content resource type

Animation
Audio
Diagram
Game
Image
Multimedia
Poster
Slides
Text
Video
Website
Other

## Expertise (Skill) Level

Beginner
Intermediate
Advanced
All

## Qualification

Badge
Certification
Accreditation

None

# language-list

<https://www.iso.org/standard/22109.html>

## Languages

No.	Language
1	Abkhazian (ab)
2	Afar (aa)
3	Afrikaans (af)
4	Akan (ak)
5	Albanian (sq)
6	Amharic (am)
7	Arabic (ar)
8	Aragonese (an)
9	Armenian (hy)
10	Assamese (as)
11	Avaric (av)
12	Avestan (ae)
13	Aymara (ay)
14	Azerbaijani (az)
15	Bambara (bm)
16	Bashkir (ba)
17	Basque (eu)
18	Belarusian (be)
19	Bengali (bn)
20	Bihari (bh)
21	Bislama (bi)
22	Bosnian (bs)
23	Breton (br)
24	Bulgarian (bg)
25	Burmese (my)
26	Catalan (ca)
27	Chamorro (ch)
28	Chechen (ce)
29	Chichewa (ny)
30	Chinese (zh)
31	Chuvash (cv)
32	Cornish (kw)
33	Corsican (co)
34	Cree (cr)
35	Croatian (hr)
36	Czech (cs)
37	Danish (da)
38	Divehi (dv)
39	Dutch (nl)
40	Dzongkha (dx)
41	English (en)
42	Esperanto (eo)
43	Estonian (et)
44	Ewe (ee)
45	Faroese (fo)

## language-list

46	Fijian (fj)
47	Finnish (fi)
48	French (fr)
49	Fula (ff)
50	Gaelic (gl)
51	Galician (gd)
52	Georgian (ka)
53	German (de)
54	Greek (el)
55	Guarani (gn)
56	Gujarati (gu)
57	Haitian (ht)
58	Hausa (ha)
59	Hebrew (he)
60	Herero (hz)
61	Hindi (hi)
62	Hiri Motu (ho)
63	Hungarian (hu)
64	Icelandic (is)
65	Ido (io)
66	Igbo (ig)
67	Indonesian (id)
68	Interlingua (ia)
69	Interlingue (ie)
70	Inuktitut (iu)
71	Inupiak (ik)
72	Irish (ga)
73	Italian (it)
74	Japanese (ja)
75	Javanese (jv)
76	Kalaallisut (kl)
77	Kannada (kn)
78	Kanuri (kr)
79	Kashmiri (ks)
80	Kazakh (kk)
81	Khmer (km)
82	Kikuyu (ki)
83	Kinyarwanda (rw)
84	Kirundi (rn)
85	Komi (kv)
86	Kongo (kg)
87	Korean (ko)
88	Kurdish (ku)
89	Kwanyama (kj)
90	Kyrgyz (ky)
91	Lao (lo)
92	Latin (la)

## language-list

93	Latvian (lv)
94	Limburchish (li)
95	Lingala (ln)
96	Lithuanian (lt)
97	Luba-Katanga (lu)
98	Luxembourgish (lb)
99	Macedonian (mk)
100	Malagasy (mg)
101	Malay (ms)
102	Malayalam (ml)
103	Maltese (mt)
104	Manx (gv)
105	Maori (mi)
106	Marathi (mr)
107	Marshallese (mh)
108	Mongolian (mn)
109	Nauru (na)
110	Navajo (nv)
111	Ndonga (ng)
112	Nepali (ne)
113	Northern Ndebele (nd)
114	Norwegian (no)
115	Norwegian bokmål (nb)
116	Norwegian nynorsk (nn)
117	Nuosu (ii)
118	Occitan (oc)
119	Ojibwe (oj)
120	Old Church Slavonic (cu)
121	Oriya (or)
122	Oromo (om)
123	Ossetian (os)
124	Pāli (pi)
125	Pashto (ps)
126	Persian (fa)
127	Polish (pl)
128	Portuguese (pt)
129	Panjabi (pa)
130	Quechua (qu)
131	Romanian (ro)
132	Romansh (rm)
133	Russian (ru)
134	Sami (se)
135	Samoan (sm)
136	Sango (sg)
137	Sanskrit (sa)
138	Sardinian (sc)
139	Serbian (sr)

## language-list

140	Sesotho (st)
141	Setswana (tn)
142	Shona (sn)
143	Sindhi (sd)
144	Sinhalese (si)
145	Slovak (sk)
146	Slovenian (sl)
147	Somali (so)
148	Southern Ndebele (nr)
149	Spanish (es)
150	Sundanese (su)
151	Swahili (sw)
152	Swati (ss)
153	Swedish (sv)
154	Tagalog (tl)
155	Tahitian (ty)
156	Tajik (tg)
157	Tamil (ta)
158	Tatar (tt)
159	Telugu (te)
160	Thai (th)
161	Tibetan (bo)
162	Tigrinya (ti)
163	Tonga (to)
164	Tsonga (ts)
165	Turkish (tr)
166	Turkmen (tk)
167	Twi (tw)
168	Ukrainian (uk)
169	Urdu (ur)
170	Uyghur (ug)
171	Uzbek (uz)
172	Venda (ve)
173	Vietnamese (vi)
174	Volapük (vo)
175	Wallon (wa)
176	Welsh (cy)
177	Western Frisian (fy)
178	Wolof (wo)
179	Xhosa (xh)
180	Yiddish (yi)
181	Yoruba (yo)
182	Zhuang (za)
183	Zulu (zu)
184	Other

## T4.3 Appendix 6

# Metadata for Learning Resources

Author: Pascal Flohr (DANS-KNAW)

Contributors (CIDOC CRM mapping): Maria Theodoridou (FORTH) and Achille Felicetti (PIN)

Keywords: training resources, learning resources, metadata standards, controlled vocabularies, metadata mappings, semantic artefacts

### T4.3 Appendix 6a

Minimal metadata for learning resources comparison between the RDA Minimal Metadata for Learning Resources,<sup>1</sup> the SSHOC Training Discovery Toolkit (item and source fields),<sup>2</sup> and the EOSC Data Model for Training Providers.<sup>3</sup> The 4CH column indicates the T4.3 recommendation for fields to integrate into the KB.

Metadata field	Definition <sup>4</sup>	RDA MMLR	SSHOC TDT (item)	SSHOC TDT (source)	EOSC	4CH
ID					X	X
Title	The human readable name of the resource.	X	X	X	X	X
Abstract / Description / Basic description	A brief synopsis about or description of the learning resource.	X	X	X	X	X
Author(s) / Creators / Contributors	Name of entity(ies) authoring the resource.	X	X		X	X
Contributor Name	Name of entity(ies) authoring the resource.		X			
Contributor Email	Email of entity(ies) authoring the resource.		X			
Contributor ORCID	ORCID of entity(ies) authoring the resource.		X			X
Contributor Links	Other PIDs of entity(ies) authoring the resource.		X			
(Primary) Language(s)	Language in which the resource was originally published or made available. (EOSC: Different resources for different languages)	X	X	X	X	X
Keyword(s) / Topics	Keywords or tags used to describe the resource.	X	X	X	X	X
Curated topics			X	X		
Licence	A license document that applies to this content, typically indicated by URL	X	X	X	X	X
Version Date / Last updated date	Version date for the most recently published or broadcast resource.	X	X	X	X	X
Created Date	Original data of creation or publication of the (first version of the) resource.		X	X		X
URL to Resource / Access point	URL that resolves to the learning resource or to a "landing page" for the resource that contains important contextual information including the	X	X	X	X	X

<sup>1</sup> Hoebelheinrich, Nancy J, Biernacka, Katarzyna, Brazas, Michelle, Castro, Leyla Jael, Fiore, Nicola, Hellström, Margareta, Lazzeri, Emma, Leenarts, Ellen, Martinez Lavanchy, Paula Maria, Newbold, Elizabeth, Nurnberger, Amy, Plomp, Esther, Vaira, Lucia, van Gelder, Celia W G, & Whyte, Angus. (2022). Recommendations for a minimal metadata set to aid harmonised discovery of learning resources (1.0). <https://doi.org/10.15497/RDA00073>

<sup>2</sup> Ricarda Braukmann, Ellen Leenarts, Simon Saldner, Veronika Keck, Judith Wehmeyer, Alejandra Albuerno, Klaus Illmayer, Matej Durco, Vasso Kalaitzi, Tatsiana Yankelevich, Darja Fiser, Ana Cvek, & Anca Vlad. (2022). D6.11 SSHOC Trainer Toolkit (final) (v1.0). Zenodo. <https://doi.org/10.5281/zenodo.6564283>

<sup>3</sup> <https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model>, the version of February 2023 was used, changes have been made since then.

<sup>4</sup> RDA Hoebelheinrich et al. 2022, EOSC Future D9.2

	direct resolvable link to the resource, if applicable.					
Harvesting (URL)				X		
Resource URL Type	Designation of the identifier scheme used for the resource URL, e.g., DOI, ARK, Handle.	X			X	X
Target Group (Audience) / Intended audience	Principal users(s) for which the resource was designed.	X	X	X	X	X
Disciplines / Scientific Domain	The branch of science, scientific discipline that is related to the resource.		X	X	X	
Scientific Subdomain	The sub-branch of science, scientific discipline that is related to the resource.				X	X
Learning Resource Type / Format(s)	The predominant type or kind that characterises the learning resource.	X	X	X	X	X
Content resource type	The predominant content type of the learning resource (video, game, diagram, slides, etc.)				X	X
Learning Outcome	Descriptions of what knowledge, skills or abilities a learner should acquire on completion of the resource.	X	X		X	X
Access Cost / Free access	Access cost: Choice stating whether or not there is a fee for use of the resource (CV = Y/N/Maybe with recommendation that further explanation of "Maybe" goes in the Description field for "It depends" or "It changes" explanations).	X	X			
Access condition(s) / Access rights			X	X	X	X
Qualification	Identification of certification, accreditation or badge obtained with a course or learning resource.				X	
Duration	Approximate or typical time it takes to work with or through the learning resource for the typical intended target audience.				X	
Expertise (Skill) Level	Target skill level in the topic being taught; example values include: beginner, intermediate, advanced.	X	X		X	X
Source			X			
Curator				X		
Responsible organisation / Resource organisation	The name of the organisation that manages or delivers the resource, or that coordinates the resource delivery in a federated scenario.			X	X	X
Resource providers	The name(s) of (all) the providers that manage or deliver the resource in federated scenarios.				X	
Extent				X		
Status				X		



Geographic availability	Locations where the resource is offered.				X	
Contact				X		
Contact First Name	First Name of the Resource's main contact person/Resource manager.				X	
Contact Last Name	Last Name of the Resource's main contact person/Resource manager.				X	
Contact Email	Email of the Resource's main contact person/Resource manager.				X	
Contact Phone	Telephone of the Resource's main contact person/Resource manager.				X	
Contact Position	Position of the Resource's main contact person/Resource manager.				X	
Contact Organisation	The organisation to which the Resource's main contact person/Resource manager is affiliated.				X	

### T4.3 Appendix 6b: Minimal Metadata for Learning Resources Mappings<sup>5</sup>

Metadata field	<a href="https://schema.org">schema.org</a> after SSHOC <sup>6</sup>	CIDOC CRM	For 4CH KB
Title	name [Thing]	P102 has title E35 Title	X
Abstract / Description / Basic description	Description [Thing]	P3 has note xsd:string	X
Author(s) / Creators / Contributors	author [Thing > CreativeWork]	P94i was created by E65 Creation P14 carried out by E39 Actor [in the role of="Author"/"Creator"/"Contributor"]	X
Contributor Name	name [Thing > Person]	E39 Actor P1 is identified by E41 Appellation [type="name"]	
Contributor Email	email [Thing > Person]	E39 Actor P76 has contact point E41 Appellation [type="email"]	
Contributor ORCID	identifier [Thing > Person]	E39 Actor P1 is identified by E41 Appellation [type="ORCID"]	X
Contributor Links	identifier [Thing > Person]	E39 Actor P1 is identified by E41 Appellation [type="link"]	
(Primary) Language	inLanguage [Thing > CreativeWork]	P72 has language E56 Language [type="primary"]	X
Languages	inLanguage [Thing > CreativeWork]	P72 has language E56 Language	
Keyword(s) / Topics	keywords [Thing > CreativeWork]	P1 has type E55 Type [P1 has type-> E55 Type = "Keyword"]	X
Curated topics	teaches [Thing > LearningResource]	P1 has type E55 Type [P1 has type-> E55 Type = "Curated topic"]	
Licence	license [Thing > CreativeWork]	P104_is_subject_to E30_Right [type="License"]	X
Version Date / Last updated date	dateModified [Thing > CreativeWork]	P124i was transformed by E81 Transformation P4 has time-span E52 Time Span [type="Version Date"]	X

<sup>5</sup> Original table:

[https://docs.google.com/spreadsheets/d/1d\\_WrY59e2PwnfRTRLUKVvLOWslqvcAnNHAOQkSodFFc/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1d_WrY59e2PwnfRTRLUKVvLOWslqvcAnNHAOQkSodFFc/edit?usp=sharing)

<sup>6</sup> Braukmann et al. 2022

Created Date	dateCreated [Thing > CreativeWork]	P94i was created by E65 Creation P4 has time-span E52 Time Span [type="Creation Date"]	X
URL to Resource / Access point	url [Thing]	PP50 accessible at PE29 Access Point	X
Harvesting (URL)	url [Thing > Intangible > Service > WebAPI]	PP4i is hosted by PE17 Curated Data Service PP29 uses access protocol	
Resource URL Type		PP50 accessible at PE29 Access Point P1 has type E55 Type	X
Target Group (Audience)	name [Thing > Audience]	P103 was intended for E55 Type [type="Audience"]	X
(sub)Disciplines	educationalAlignment; alignmentType; targetName; targetURL [Thing > CreativeWork]	P101 had as general use E55 Type [type="Disciplines"]	X
Learning Resource Type / Format(s)	learningResourceType [Thing > LearningResource]	PP58 is encoded with PE43 Encoding Type	X
Learning Outcome(s)	teaches[Thing > LearningResource]	P101 had as general use E55 Type [type="Disciplines"]	X
Access Cost / Free access	isAccessibleForFree [Thing > CreativeWork]	P1 has type E55 Type [P1 has type-> E55 Type = "Access Cost"] instances take the values Free or Paid	
Access condition(s) / Rights	conditionsOfAccess [Thing > Property]; conditionsOfAccess [Thing > CreativeWork]	P104_is_subject_to E30_Right P2_has_type E55_Type["Access Conditions"]	X
Expertise (Skill) Level	educationalLevel [Thing > LearningResource]	P1 has type E55 Type [P1 has type-> E55 Type = "Expertise Level"]	X
Source	provider [Thing > CreativeWork]	PP4i is hosted by PE17 Curated Data Service PP2 provided by E39 Actor [in the role of="provider"]	
Curator	none	PP4i is hosted by PE17 Curated Data Service PP2 provided by E39 Actor [in the role of="curator"]	
Responsible organisation	name; email; identifier [Thing > Organization]	PP4i is hosted by PE17 Curated Data Service PP2 provided by E39 Actor [in the role of="responsible"]	X

Contact	name; email; identifier [Thing > Organization]	PP4i is hosted by PE17 Curated Data Service PP2 provided by E39 Actor P76 has contact point E41 Appellation	
Extent	materialExtent [Thing > CreativeWork]	P43 has dimension E54 Dimension	
Status	creativeWorkStatus [Thing > CreativeWork]	P2 has type E55 Type [type="Status"]	
Qualification			X

### T4.3 Appendix 6c (suggested) controlled vocabularies and authority lists

#### Metadata element: Language(s) or primary language

Vocabulary / authority list: <https://www.iso.org/standard/22109.html>

#### Metadata element: Scientific (sub)domain

Vocabulary / authority list:

Term	Description	Source
Generic	Not targeting a specific domain	EOSC Future <sup>7</sup>
Cultural heritage		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605008">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605008</a>
Archaeology		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/601003">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/601003</a>
Architecture		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/2012">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/2012</a>
Art history		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/604019">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/604019</a>
Cultural management		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605006">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605006</a>
Digital humanities		<a href="https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605007">https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/605007</a>

Selected from ACDH\_CH,<sup>8</sup> more terms from there could be selected if relevant. The structure there could also be followed, but seemed less suitable for 4CH purposes.

Main source URL:

<https://vocabs.acdh.oeaw.ac.at/oefos/en/page/?uri=https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/2012>

#### Metadata element: Licence

Vocabulary / authority list:

Term	Description	Source
Public domain		
CC0	Creative Commons CC0 1.0 Universal: The person who associated a work with CC0 1.0 has dedicated the work to the public domain by waiving all of his or her rights to the work worldwide under copyright law, including all related and neighbouring rights, to the extent allowed by law. One can copy, modify, distribute and perform the work, even for commercial purposes, all without asking permission. Type of public domain license.	Creative Commons; EU vocabularies <sup>9</sup>
CC BY	Creative Commons Attribution	Creative Commons
CC BY-SA	Creative Commons Attribution ShareAlike	Creative Commons
CC BY-NC	Creative Commons Attribution NonCommercial	Creative Commons
CC BY-NC-SA	Creative Commons Attribution NonCommercial ShareAlike	Creative Commons

<sup>7</sup>

<https://wiki.eoscfuture.eu/display/PUBLIC/B.+v4.00+EOSC+Resource+Profile#B.v4.00EOSCResourceProfile-ResourceScientificDomain>

<sup>8</sup> <https://vocabs.acdh.oeaw.ac.at/oefos/en/page/?uri=https://vocabs.acdh.oeaw.ac.at/oefosdisciplines/2012>

<sup>9</sup>

<https://op.europa.eu/en/web/eu-vocabularies/concept-scheme/-/resource?uri=http://publications.europa.eu/resource/authority/licence>

CC BY-ND	Creative Commons Attribution No Derivatives	Creative Commons
CC BY-NC-ND	Creative Commons Attribution NonCommercial No Derivatives	Creative Commons
Other open licence		
Other non-open licence		
Unknown		

#### Metadata element: Resource URL Type

Vocabulary / authority list:

Term	Description	Source
ARK	Archival Resource Key	EOSC Future <sup>10</sup>
DOI	Digital Object Identifier	EOSC Future
HANDLE	Handle	EOSC Future
URN	Uniform Resource Name	EOSC Future
URI	Uniform Resource Identifier	EOSC Future
URL	Uniform Resource Locator	EOSC Future
Not applicable	-	-

Source URL:

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-ResourceURLtype>

#### Metadata element: Access rights

Vocabulary / authority list:

Term	Description	Source
Open access	Open access refers to a resource that is immediately and permanently online, and free for all on the Web, without financial and technical barriers.	EOSC Future <sup>11</sup>
Restricted access	Restricted access refers to a resource that is available in a system but with some type of restriction for full open access.	EOSC Future
Metadata only access	Metadata only access refers to a resource in which access is limited to metadata only. The resource itself is described by the metadata, but neither is directly available through the system or platform nor can be referenced to an open access copy in an external source.	EOSC Future
Paid access	Paid access refers to the need to pay a fee to access the resource.	EOSC Future

<sup>10</sup>

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-ResourceURLtype>  
<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-ResourceURLtype>

<sup>11</sup>

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-AccessRights>

Source URL:

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-AccessRights>

**Metadata element: Target group (audience) - broad**

Vocabulary / authority list:

Term	Description	Source
Practitioner	See D4.2 text	See D4.2
Manager	See D4.2 text	See D4.2
Policy maker	See D4.2 text	See D4.2

Perhaps more detailed audience categories should be added as a separate metadata field.

**Metadata element: Learning resource type**

Vocabulary / authority list:

Term	Description	Source
Activity plan / Learning activity	Detailed description of an activity engaged in by the learner for the purpose of acquiring certain skills, concepts, or knowledge, whether guided by an instructor or not. Exercise.	<a href="#">LRMI</a> ; <a href="#">SSHOC</a> ; <a href="#">CEDS</a>
Assessment	Set of assessment items used to evaluate or promote learning.	<a href="#">LRMI</a>
Assessment item	Specific prompt, that defines a question or protocol for a measurable activity that triggers a response from a person used to determine whether the person has mastered a learning objective.	<a href="#">LRMI</a> ; <a href="#">CEDS</a>
Course	A series of units and lessons used to teach the skills and knowledge required by its curriculum.	<a href="#">CEDS</a> ; <a href="#">SSHOC</a>
Demonstration/Simulation	An imitation or modeling of a real-world process.	<a href="#">CEDS</a> ; <a href="#">SSHOC</a>
e-Learning module		<a href="#">SSHOC</a>
Educator curriculum guide	A document that defines what concepts should be taught and/or how a concept should be taught effectively.	<a href="#">CEDS</a>
Lesson (plan)	A detailed description of the course of instruction for a short period of time that is used by a teacher to guide class instruction. A unit contains one or more lessons.	<a href="#">LRMI</a> ; <a href="#">SSHOC</a> ; <a href="#">CEDS</a>
Physical learning resource	Physical object, hardware or device designed to help a learner achieve some learning objective.	<a href="#">LRMI</a>
Recorded lesson	Audio or video recording, or textual record (e.g. transcript or edited script) of a lesson, lecture or similar short instructional event. Includes webinars.	<a href="#">LRMI</a> ; <a href="#">SSHOC</a> (webinar)

Supporting document	Document with an instructional component designed to help a learner achieve some learning objective.	<a href="#">LRMI</a>
Textbook	Book designed to be used as a standard source of information to facilitate learning of a particular subject.	<a href="#">LRMI</a> ; <a href="#">SSHOC</a> ; <a href="#">CEDS</a>
Unit (plan)	Long-range plan of instruction on a particular concept.	<a href="#">LRMI</a> ; <a href="#">SSHOC</a> ; <a href="#">CEDS</a>
Other		<a href="#">CEDS</a>

Main source(s) URL:

<http://purl.org/dcx/lrmi-vocabs/learningResourceType/>;

<https://ceds.ed.gov/element/000928/>;

<https://vocabs.sshopencloud.eu/browse/sshoc-training-resource-format/en/>

#### Metadata element: Learning resource type

Vocabulary / authority list:

Term	Source
Animation	EOSC Future
Audio	EOSC Future; <a href="https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/audio">https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/audio</a>
Diagram	EOSC Future
Game	EOSC Future; <a href="https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/educationalGame">https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/educationalGame</a>
Image	EOSC Future; <a href="https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/image">https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/image</a>
Multimedia	EOSC Future
Poster	EOSC Future
Slides	EOSC Future; <a href="https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/slides">https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/slides</a>
Text	EOSC Future
Video	EOSC Future; <a href="https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/video">https://vocabs.sshopencloud.eu/vocabularies/sshoc-training-resource-format/video</a>
Website	EOSC Future
Other	EOSC Future

Main source URL:

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-Contentresourcetype>

#### Metadata element: Expertise (skill) Level

Vocabulary / authority list:

Term
Beginner
Intermediate
Advanced
All

#### Metadata element: Qualification

Vocabulary / authority list:

Term
Badge





Certification
Accreditation
None

Source URL:

<https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Training+Resource+Profile+-+Data+Model#EOSCTrainingResourceProfileDataModel-Qualification>

## T4.3 Appendix 7

# Learning resources metadata template

**A template to fill in training metadata to ingest into the 4CH Knowledge Base**

Author of the spreadsheet: Pascal Flohr (DANS-KNAW)

Version: 20230426 (26 April 2023)

Instructions:

1. Ensure your training resource is uploaded in a repository, for example Zenodo.
2. Fill in all or as many of the metadata fields as you can in a copy of this template.
3. Submit it as is, or convert to CSV, JSON, or, preferably, XML
4. Put the file to submit in the T3.4 folder on the 4CH Google Drive (for external users, please contact 4CH general info or WP3)

For anything that does not fit into a controlled vocabulary, please make a note in the comment box (last column).

For data model, controlled vocabularies, and mappings, see D4.2 T4.3 Appendix 6.

The document is provided as a spreadsheet.

**Metadata elements based on:**

[RDA Minimal Metadata for Learning Resources](#)

[EOSC Training Resource Profile](#)

[SSHOC Training Discovery Toolkit metadata](#)

**Vocabularies based on:**

[Austrian Fields of Science and Technology Classification 2012](#)

[CEDS Common Education Data Standards - Learning Resource Type](#)

[Creative Commons](#)

[Dublin Core LRMI Learning Resource Type vocabulary](#)

[EOSC Portal Profiles](#)

[\\_especially the EOSC Training Resource Profile](#)

[EU Vocabularies - Licence](#)

[SSH Open Cloud Vocabs - training resources](#)



# vocabularies

Source per entry: see D4.2 T4.3 Appendix 6

## Scientific (sub)domain

Generic
Cultural heritage
Digital humanities
Cultural management
Archaeology
Art history
Architecture

## Licence

Public Domain
CC0
CC BY
CC BY-SA
CC BY-NC
CC BY-NC-SA
CC BY-ND
CC BY-NC-ND
Full copyright
Other open licence
Other non-open licence
Unknown

## Resource URL type

ARK
DOI
HANDLE
URN
URI
URL
Not applicable

## Access rights

Open access
Restricted access
Metadata only access
Paid access

## Target group (Audience)

Researcher / practitioner
Manager
Policy maker

# vocabularies

## Learning resource type

Activity plan / Learning activity
Assessment
Assessment item
Course
Demonstration/Simulation
e-Learning module
Educator curriculum guide
Lesson (plan)
Physical learning resource
Recorded lesson
Supporting document
Textbook
Unit (plan)
Other

## Content resource type

Animation
Audio
Diagram
Game
Image
Multimedia
Poster
Slides
Text
Video
Website
Other

## Expertise (Skill) Level

Beginner
Intermediate
Advanced
All

## Qualification

Badge
Certification
Accreditation

None

# language-list

<https://www.iso.org/standard/22109.html>

## Languages

No.	Language
1	Abkhazian (ab)
2	Afar (aa)
3	Afrikaans (af)
4	Akan (ak)
5	Albanian (sq)
6	Amharic (am)
7	Arabic (ar)
8	Aragonese (an)
9	Armenian (hy)
10	Assamese (as)
11	Avaric (av)
12	Avestan (ae)
13	Aymara (ay)
14	Azerbaijani (az)
15	Bambara (bm)
16	Bashkir (ba)
17	Basque (eu)
18	Belarusian (be)
19	Bengali (bn)
20	Bihari (bh)
21	Bislama (bi)
22	Bosnian (bs)
23	Breton (br)
24	Bulgarian (bg)
25	Burmese (my)
26	Catalan (ca)
27	Chamorro (ch)
28	Chechen (ce)
29	Chichewa (ny)
30	Chinese (zh)
31	Chuvash (cv)
32	Cornish (kw)
33	Corsican (co)
34	Cree (cr)
35	Croatian (hr)
36	Czech (cs)
37	Danish (da)
38	Divehi (dv)
39	Dutch (nl)
40	Dzongkha (dx)
41	English (en)
42	Esperanto (eo)
43	Estonian (et)
44	Ewe (ee)
45	Faroese (fo)

## language-list

46	Fijian (fj)
47	Finnish (fi)
48	French (fr)
49	Fula (ff)
50	Gaelic (gl)
51	Galician (gd)
52	Georgian (ka)
53	German (de)
54	Greek (el)
55	Guarani (gn)
56	Gujarati (gu)
57	Haitian (ht)
58	Hausa (ha)
59	Hebrew (he)
60	Herero (hz)
61	Hindi (hi)
62	Hiri Motu (ho)
63	Hungarian (hu)
64	Icelandic (is)
65	Ido (io)
66	Igbo (ig)
67	Indonesian (id)
68	Interlingua (ia)
69	Interlingue (ie)
70	Inuktitut (iu)
71	Inupiak (ik)
72	Irish (ga)
73	Italian (it)
74	Japanese (ja)
75	Javanese (jv)
76	Kalaallisut (kl)
77	Kannada (kn)
78	Kanuri (kr)
79	Kashmiri (ks)
80	Kazakh (kk)
81	Khmer (km)
82	Kikuyu (ki)
83	Kinyarwanda (rw)
84	Kirundi (rn)
85	Komi (kv)
86	Kongo (kg)
87	Korean (ko)
88	Kurdish (ku)
89	Kwanyama (kj)
90	Kyrgyz (ky)
91	Lao (lo)
92	Latin (la)



## language-list

93	Latvian (lv)
94	Limburchish (li)
95	Lingala (ln)
96	Lithuanian (lt)
97	Luba-Katanga (lu)
98	Luxembourgish (lb)
99	Macedonian (mk)
100	Malagasy (mg)
101	Malay (ms)
102	Malayalam (ml)
103	Maltese (mt)
104	Manx (gv)
105	Maori (mi)
106	Marathi (mr)
107	Marshallese (mh)
108	Mongolian (mn)
109	Nauru (na)
110	Navajo (nv)
111	Ndonga (ng)
112	Nepali (ne)
113	Northern Ndebele (nd)
114	Norwegian (no)
115	Norwegian bokmål (nb)
116	Norwegian nynorsk (nn)
117	Nuosu (ii)
118	Occitan (oc)
119	Ojibwe (oj)
120	Old Church Slavonic (cu)
121	Oriya (or)
122	Oromo (om)
123	Ossetian (os)
124	Pāli (pi)
125	Pashto (ps)
126	Persian (fa)
127	Polish (pl)
128	Portuguese (pt)
129	Panjabi (pa)
130	Quechua (qu)
131	Romanian (ro)
132	Romansh (rm)
133	Russian (ru)
134	Sami (se)
135	Samoan (sm)
136	Sango (sg)
137	Sanskrit (sa)
138	Sardinian (sc)
139	Serbian (sr)

## language-list

140	Sesotho (st)
141	Setswana (tn)
142	Shona (sn)
143	Sindhi (sd)
144	Sinhalese (si)
145	Slovak (sk)
146	Slovenian (sl)
147	Somali (so)
148	Southern Ndebele (nr)
149	Spanish (es)
150	Sundanese (su)
151	Swahili (sw)
152	Swati (ss)
153	Swedish (sv)
154	Tagalog (tl)
155	Tahitian (ty)
156	Tajik (tg)
157	Tamil (ta)
158	Tatar (tt)
159	Telugu (te)
160	Thai (th)
161	Tibetan (bo)
162	Tigrinya (ti)
163	Tonga (to)
164	Tsonga (ts)
165	Turkish (tr)
166	Turkmen (tk)
167	Twi (tw)
168	Ukrainian (uk)
169	Urdu (ur)
170	Uyghur (ug)
171	Uzbek (uz)
172	Venda (ve)
173	Vietnamese (vi)
174	Volapük (vo)
175	Wallon (wa)
176	Welsh (cy)
177	Western Frisian (fy)
178	Wolof (wo)
179	Xhosa (xh)
180	Yiddish (yi)
181	Yoruba (yo)
182	Zhuang (za)
183	Zulu (zu)
184	Other