Project Number: [739503]

Project Acronym: [E-RIHS PP]

Project title: [European Research Infrastructure for Heritage Science Preparatory Phase]

Periodic Technical Report

Part B

Period covered by the report: from [01/02/2017] to [31/07/2018]
Periodic report: [1 st]

1. Explanation of the work carried out by the beneficiaries and Overview of the progress

The activities of E-RIHS PP on its 18th months are in line with the programmed development of the project. Few deliverables were delivered with a slight delay (see explanation in the comments in the participant portal or in the WPs reports). The delay did not have any significant impact on the execution of the planned tasks. The project flow is under control.

1.1. Objectives

E-RIHS PP is working for the main objective: The establishment of a unique European research infrastructure for Heritage Science in the next few years.

The objectives of E-RIHS PP are

A. to develop a sound business case, including a sustainable financial plan, for implementing an inclusive E-RIHS with the support of as many as possible founders from Member States and Associated Countries, addressing all the issues highlighted by ESFRI in their evaluation report;

B. to produce a strong implementation plan for the E-RIHS.

with specific objectives that are to :

- design a suitable governance including the roles of National Hubs and the relationship between E-RIHS Central Hub and National Hubs (WP2);
- develop E-RIHS statutes (WP 4);
- develop an access policy and user strategy and a central system for applying for (and granting of) access and services (WP5, WP8);
- define common data policies and procedures for data management (WP5);
- define common open-access policies to data and publications (WP5);
- define a sound policy for human resource acquisition and management (WP3);
- implement a strong communication and advocacy plan to help collecting stable financial commitments from all potential partners (WP10);
- develop investment strategies based on gap analyses of existing capabilities and on a common strategic vision of the sector (WP8, WP9);
- draw up a comprehensive risk analysis and risk mitigation strategy for E-RIHS (WP2);
- develop a quality management system with adequate monitoring capacities and efficient KPIs (WP2);
- develop synergies with other ESFRI RIs and EU relevant initiatives and with e-infrastructures (WP6, WP11);
- promote the inclusion of scholars and of new communities of users (WP7);
- provide a training plan and training policies for E-RIHS (WP7).

1.2. Explanation of the work carried per WP

The overall progress can be summarized as follows:
WP1 All project bodies were established. Most importantly, a Stakeholders Advisory Board (SAB) composed by distinguished representatives of decision-making funding bodies – for each country participating – creates a continuous interaction between the project and its major stakeholders, helping strategic, legal and financial planning to converge to commonly agreed solutions.

WP2 the documents on the quality assessment, key performance indicators and risk management, and ethical guidelines are drafted. Work is underway in designing the governance structure, the governance and roles of central and national hubs.

WP3 has developed different scenarios of funding and cost models that are ready for further refinement. A preliminary report on the financial aspects of data policy and management has been drafted.

WP4 is finalizing a set of legal documents (e.g., Memorandum of Understanding, Statutes) for the establishment and the operation of E-RIHS ERIC.

WP5 is designing an integrated and interoperable Access Policy and Procedures in reference to the four project platforms, with a special attention to data access and interoperability in light of recent EU flagship initiatives such as EOSC, the European Open Science Cloud; is liaising with global initiatives on data RDA, the Research Data Alliance, where E-RIHS is active through the participation in the GEDE (Group of European Data Experts).

WP6 Major progress was achieved with regard to cooperation with the intergovernmental organization ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) which led to the drafting of a statement for cooperation proposal, now ready to be signed. The cost-benefit analysis and socio-economic impact assessment as well as the investment policies for the lifecycle of E-RIHS including its transition phase are currently under implementation.

WP7 E-RIHS is been building partnerships with other heritage organisations and training providers such as ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) and PARTHENOS (Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies). Plan on Education and Training has been devised and the Training Strategy drafted.

WP8 is performing the inventory of services for new communities of users for E-RIHS related to the study and interpretation of cultural heritage by the different communities (e.g. Paleoanthropology, Archaeology, Conservation, Social Sciences and Humanities. The design of an online catalogue of resources and services provided by E-RIHS is advancing.

WP9 The first version of the Scientific Vision document was prepared and feeds into Scientific Strategy and the E-RIHS Scientific and Technical description (S&TD), one of the documents for the application for ERIC status. Innovation is a second pillar of E-RIHS success in balance with Scientific Excellence. In this respect, Analysis of the Innovation Background document reviewing the current innovation background for the E-RIHS partnership and assessing the existing heritage science innovation landscape has been prepared as a backbone for the Innovation Agenda.

WP10 has set the basis to launch the Heritage Hub, an easy-to-use but powerful collaboration platform able to act as an access point for information, services, good practices, training and virtual meetings for researchers, users, stakeholders to discuss topics of interest

WP11 provides a coherent strategy and plans for the adoption of project outcomes, including business and legal work, to prepare the E-RIHS implementation. First outline of the Scientific & Technical Description document has been prepared.

1.2.1. <u>Work Package 1: Project Management (CNR)</u>

State of the work carried out
In the first 18M, WP1 carried out the activities as planned in the proposal. At the beginning of the project, all the partners signed the Consortium Agreement, this becoming the drive document for the governance of the project.

T1.1 (**Establishment and operation of the project management bodies**)
Task leader: CNR – *Luca Pezzati*
Task 1.1 is focused on establishing a robust project management structure. Decision-making, advisory and supporting bodies were established as scheduled to manage the project. The composition of the above-mentioned bodies is the following:

1-Governing Board (GB), chaired by Luca Pezzati (CNR), the Project Coordinator (PC):

Beneficiary	Representative	Deputy
CNR	Gilberto Corbellini	Marta Rapallini
KIK-IRPA	Hilde De Clercq	Wim Fremout
CYI	Sorin Hermon	Nikolas Bakirtzis
ITAM	Miloš Drdácký	Michal Vopálenský
DAI	Reinhard Förtsch	Sebastian Cuy
CSIC	Emilio Cano	Marta Castillejo Striano
CENIEH	Maria Martinon	Carlos de Quevedo Puente
CNRS	Loïc Bertrand	Francois Mirambet
DARIAH	Laurent Romary	Mike Mertens
FORTH	Demetrios Anglos	Dimitrios Kafetzopoulos
MTA	Zita Szikszai	Mihaly Molnar
DP	Anthony Corns	Mary Teehan
IAA	Gideon Avni	Hamudi Khalaily
CERIC	Jana Kolar	Ornela de Giacomo
PIN	Franco Niccolucci	Franco Niccolucci
RCE	Susan Lammers	Jan Van't Hof
NCU	Piotr Targowski	Magdalena Iwanicka
LNEC	Joao Manuel Mimoso	Juan Mata
IPCHS	Polonca Ropret	Črtomir Tavzes
UCL	May Cassar	Julian Richards

2-Steering Committee (SC)

WP	Title	Leader	Institution
WP1	Project management	Luca Pezzati	CNR
WP2	Governance	Jan Van't Hof	RCE

WP3	Financial planning	Joao Manuel Mimoso	LNEC
WP4	Legal work	Isabelle Pallot-Frossard	CNRS
WP5	Access and interoperability	Franco Niccolucci	PIN
WP6	Sustainability	Miloš Drdácký	ITAM
WP7	E-RIHS Academy	Matija Strlic	UCL
WP8	E-RIHS services for HS scholars	Mohamed Sahnouni*	CENIEH
WP9	Excellence and innovation	Demetrios Anglos	FORTH
WP10	Advocay, Communication & dissemination	Sorin Hermon	CYI
WP11	Implementation	Luca Pezzati	CNR
Observer	Observer	Alison Heritage	ICCROM

Mohamed Sahnouni replaced Maria Jose De Miguel Del Barrio (CENIEH).

3-Stakeholder Advisory Board (SAB) established (MS03 has been met)

Country	Organisation name	Type of organisation	Delegate(s)
International	ICCROM-International Centre for the Study of the Preservation and Restoration of Cultural Property	Intergovernmental organization	Alison Heritage
Transnational	Joint Programming Initiative on Cultural Heritage	JPI	Cristina Sabbioni
AT-Austria	The Austrian Federal Chancellery Division II: Arts and Culture	Not in E-RIHS PP	Doris Karner (t.b.c.)
BE-Belgium	Belgian Science Policy	Funding body	Laurence Lenoir
CY-Cyprus	Directorate General for European Programmes, Coordination and Development	Funding body	Marina Solomidou-Ieronymidou
CZ-Czech Republic	Ministry for Education, Youth and Sports	Ministry	*Not yet appointed*
DE-Germany	Auswärtiges Amt	Ministry	*Not yet appointed*
ES-Spain	Ministry of Science, Innovation and Universities	Ministry	Ángela Fernández Curto
	Ministerio de Educación, Cultura y Deporte	Ministry	María Martín Gil
FR-France	Ministère de la Culture et de la Communication	Ministry	Pascal Lievaux
	Ministère de l'Éducation Nationale, de l'Enseignement Supérieur et de la Recherche		Jacques Dubucs
GR-Greece	Ministry of Education, Research and Religious Affairs	Ministry	Vasililos Kylikoglou Maria Gkizeli

HU-Hungary	National Research, Development, and Innovation Office	Funding body	Előd Nemerkényi
IE-Ireland	The Heritage Council	Funding body	Beatrice Kelly, Ian Doyle
IL-Israel	Ministry of Education	Ministry	*Not yet appointed*
IT-Italy	Ministero dei Beni e Attività Culturali e del Turismo	Ministry	Marco Ciatti
	Ministero dell'Istruzione, Università e Ricerca	Ministry	Lucia Toniolo
	Ministero dello Sviluppo Economico	Ministry	*Not yet appointed*
NL-The Netherlands	Ministerie van Onderwijs, Cultuur en Wetenschap	Ministry	Robert Verhoogt
	Netherlands Organisation for Scientific Research	Funding body	Alice Dijkstra
PL-Poland	Ministerstwo Nauki i Szkolnictwa Wyższego	Ministry	*Not yet appointed*
PT-Portugal	Fundação para a Ciência e a Tecnologia	Funding body	Daniel Carapau
RO-Romania	Ministry of Research and Innovation	Funding body Not in E-RIHS PP	Viorel Vulturescu Monica Alexandru
RU-Russia	Ministry of Culture of the Russian Federation	Not in E-RIHS PP	*Not yet appointed*

4-Coordination Office (CO)

Role	Person in charge
Head of the CO	Jana Striova
Financial Officer	Francesca Usala
Reporting Officer	Laura Benassi
Communication Officer	Sorin Hermon
E-RIHS website management and communication	Elisabetta Andreassi
Expert on EU projects and international activities	Monique Bossi

Six face-to-face project meetings were organized as follows (MS01 met):

Meeting	Date	Organized by	Place
Kick off	2017/03/29	CNR	Florence, IT
1st interim	2017/05/16	FORTH	Heraklion, GR
2nd interim	2017/09/11	ITAM	Prague, CZ
3rd interim	2017/11/14	KIK-IRPA	Brussels, BE
1st annual	2018/02/21	RCE	Amsterdam, NL
4th interim	2018/04/17	KADK	Copenhagen, DK

T1.2 (Project monitoring and reporting)

Task leader: CNR – *Laura Benassi*

T1.2 is devoted to the management of daily activities from a technical and financial point of view and to the assessment of the quality of project deliverables. Under the supervision of the project coordinator (PC) and the SC, CO took care of all the relevant aspects of the project and monitored its state and progresses.

CO is in charge of managing the internal communication between the management bodies and the partners. To facilitate the flow of communication, specific tools for internal communication were set up within WP10 (D4science, Basecamp).

A workshop on reporting requirements ("Reporting in E-RIHS PP") was held during the Kick-off meeting in Florence on March 30, 2017. A downloadable version of the presentation was stored both in D4science and Basecamp.

T1.3 (Quality control of deliverables)

Task leader: CNR – *Jana Striova*

T1.3 took care of the quality of the deliverables by encompassing both the administrative aspects and the quality of their content. In the first 18 months, few (4) deliverables were submitted slightly late.

In general, no relevant problems about the quality arose.

Problems

Four deliverables were submitted by M18 and all of them were submitted slightly late, not meeting the KPI listed in the table 3.2 of the proposal (*Delay against reporting deadlines <1 week*). The reasons of the delay are explained in the comments in the participant portal or in the WP reports.

No other relevant problems arose in the first 18 months.

Achievements

All the management bodies were established in time working in synergy towards the main objectives of the project.

The Consortium Agreement was signed by all the partners at the beginning of the project. It contains the main rules of project governance.

The coordination office is working to:

- support partners in any financial, technical and reporting issues;
- improve the KPIs performance related to the deliverables' submission;
- improve internal communication among partners and to facilitate formal and informal communications with the EC;
- improve external communication and maintain the website and social media updated daily.

Gender, ethic and data protection issues are monitored following the EU rules and guidelines.

The milestones MS1, MS3 and MS6 were achieved in time.

1.2.2. <u>Work package 2: Governance (RCE)</u>

State of the work carried out

The overall aim of WP2 is 'to ensure a clear, effective and durable structure to govern E-RIHS and to monitor its progress and mitigate likely risks'. The WP consists of four tasks: drafting of a governance structure, the governance and roles of central and national hubs, quality systems and KPIs and risk

management. Thus far, the various tasks are all underway and the deadlines – in February 2019 and January 2020 – will be met with. The state of work differs per task, however.

Task 2.1 Governance structure of E-RIHS
Task leader: RCE – *Jan Van't Hof*

The governance structure of E-RIHS ERIC was first discussed in December 2017, but its final version is still under discussion within the project and with the SAB. It will then be approved by the GB. A draft of the depending tasks was discussed but needs more elaboration. A complete draft text is planned for mid-December 2018.
To arrive at the structure, several structures from other ERICs were gathered and studied. Of course, the starting point were the ERIC Guidelines.
The structure was developed in accordance with the statutes. It was discussed during meetings In Amsterdam, Prague and finally – also with the SAB – in Warsaw in September 2018.

Task 2.2 Governance and roles of central and national hubs

Task leader: CNRS (C2RMF) – *Isabelle Pallot Frossard*

This tasks aims at defining a clear and effective distributed organisation of competences between the European level (E-RIHS ERIC/ Central Hub) and the different National Nodes, having in mind that every Member of E-RIHS will have to establish one. The achievement of this goal requires a close connection to many other Work Packages, including, but not limited to, WP3 (Financial Planning), WP 4 (Legal Work), WP5 (Access and interoperability policies) and WP11 (Implementation).
The main stakes of this task are to lay out closely the different roles and interactions of the Central Hub with the National Nodes. This involves suggesting different kinds of scientific and administrative rights and obligations for entities at both levels of governance. These ideas were developed and discussed during several of the plenary assemblies of E-RIHS PP meetings, and were described in two different documents called "The Central Hub and the National Nodes" and "The scientific role of E-RIHS partner facilities in the repartition of access".
While the distribution of most competences between the Central Hub and the National Nodes did not meet any controversy, the repartition of some scientific and administrative work is still under discussion. These topics include the best way to ensure the efficient use of specific expertise and know-how available in facilities for FIXLAB and MOLAB and the potential inclusion of a geographical criteria in the repartition of accesses.
One of the first steps of this work was carried out in a detailed study of governance structures of all the extant ERICs, with a focus on distributed research infrastructures. This general study was based on EU legal documents and guidelines on ERICs, operation of research infrastructures, and scientific policies, as well as the statutes of extant ERICs and information collected on their websites and annual reports. It was then disseminated to the SAB as a report and a PowerPoint commented graphical representation of all ERIC governance structures. Because of its broad scope and the use of ERIC statutes as a base material, this study also involved work carried within WP 4 (Legal Work).
Another significant part of the work carried out under this task was to investigate the possibility to make use of the extension of VAT and excise duty exemptions to National Nodes, because it could have important ways on the formal way to establish National Nodes. The other financial part of this is the ongoing discussion on the best way to report and to value in-kind contributions from the

Members to E-RIHS ERIC. Both of these lines of work implied a comparison of what the other comparable infrastructure are doing (CERIC-ERIC in particular), and collaboration with people working on WP 3 (Financial Planning).

A third dimension of this task is to monitor the development of National Nodes and to assist the prospective Members in their National work. The information gathering part is a constant work to follow the latest development of National Nodes, as well as a mapping of existing nodes and potential facilities relying on the template and the database created in the course of WP 12 of IPERION CH. The advice and assistance part of task 2.2 was mainly materialised by the attendance of either the coordinator or other people to several meeting of National Nodes (E-RIHS.fr, E-RIHS.nl, E-RIHS.de, etc.), and mainly revolves around the ways to meet the future requirements for being an E-RIHS National Node while maintaining some autonomy.

The last part of the work conducted in the first reporting period was to anticipate the potential problems of transition period before becoming an ERIC related to link between the National and the ERIC level. This eventually took the form of an Interim National Coordinators Committee, which is set to meet for the first time on the 5th of September 2018 in Warsaw.

Task 2.3 Quality systems and KPIs
Task leader: LNEC – *Joao Mimoso*

This task, regarding quality, is already concluded via a complete draft text. It describes the various relevant issues of quality management. Existing and new partners have to be assessed, both organizational and scientific, and regarding the suitability within E-RIHS. This has to be done by a specific board (QBoard), working on E-RIHS's QManager. The assessment will of course be carried out following a clear and transparent, written procedure with identified steps, both regarding the way of assessing and the object which is to be assessed. The document is accompanied with appendices describing the key performance indicators, evaluation of DIGILAB, KPIs for self-assessment, quality manual, ethical guidelines and a guidance document of evaluation procedures and indicators.

Task 2.4 Risk management
Task leader: UCL (UB) – *Clive Billenness*

The task regarding risk management was conducted as follows. An initial workshop was held in Amsterdam in February 2018 during which a tiered approach to Corporate Risk Management, based on ISO31000 (Risk Management – Guidelines) was outlined and agreed in principle. This will enable risks to be managed at the most appropriate level within the overall ERIC, ensuring that mitigations are identified and applied effectively. This approach will also allow individual participant organisations and national hubs to avoid duplication by adopting only those components of Risk Management, based on ISO31000, where they have not already implemented an equivalent methodology which is better matched to local standards, practices and regulations. The Central Hub will adopt a methodology based on the ISO31000 risk management standard in full.

It has been necessary to await the release of the new Version 2 of ISO31000 in February 2018 to ensure that the most up-to-date approach possible was adopted. A component-based Risk Management Handbook is now being drafted, based on this new, February 2018 Edition of ISO 31000 and will be released for initial comment in October 2018.

Investigations are ongoing to identify candidate risk management tools to enable a single, global approach to be adopted to which individual organisations will have access.

Problems

The overall progress on the WP has been good, but some issues need to be addressed:

- The coherence between the various tasks, specifically between 2.1 and 2.2 and of these with 4.2 and 4.3 needs attention. Specific collaboration between task leaders, France and the Netherlands, is envisaged for the period September 2018-January 2019 to work on this. The hiring of specific expertise for task 2.1 and 4.3 will be concluded by September 2018, thus giving the intended extra impulse (because of practical issues, hiring at an earlier stage was not feasible).

Achievements

The overall progress and the mutual understanding of what E-RIHS is going to be and how it is going to function has grown over the last period. The work on deliverables is underway; this needs extra collaboration and speed, as stated above, but the quality will benefit from the work done in this and other WPs and the prolonged discussion within the consortium.

1.2.3. <u>Work package 3: Financial planning (LNEC)</u>

State of the work carried out

Global objectives of WP3 are:

1. Identify funding sources for the set-up, operation and upgrade of the research infrastructure, access provisions and new investments.
2. Recommend methods and procedures for the flow of funding through the E-RIHS organization.
3. Provide cost scenarios.

A funding model has been developed, submitted to partners in multiple instances (both in writing and at oral presentations) and to the SAB, that satisfies objectives 1 and 2. Cost models have also been developed in three different scenarios and one of those scenarios has been orally presented to partners and to the SAB.

These outcomes are in the process of adaptation to comments and further refinement but the fact that they have been readied, presented and discussed by the half-life of the project allows the WP leader to state on sound ground that he is confident that the contracted work will be brought to a successful conclusion in due time.

Task 3.1 Finance and budget

Task leader: LNEC - *João Mimoso*

The task will: i) propose the business description and related sources of revenue; ii) provide financial models with cost scenarios; iii) identify funding sources and related mechanisms for access costs and for new investments; iv) recommend methods and procedures for the flow of funding through the E-RIHS organization; v) define a set of relevant budget categories and define rules with a view to budgetary consolidation; and vi) organize all results as a financial plan to integrate the global E-RIHS Business Plan and Implementation Plan (WP11) .

All items have been addressed (albeit the results of items ii), v) and vi) cannot yet be considered complete) and the results have been included in the first version of the Scientific and Technical Description produced under WP 11 and presently in revision by the Coordinator of E-RIHS PP.

Task 3.2 Human resources strategic planning
Task leader: DARIAH – *Mike Mertens[1] / Emiliano Degli Innocenti*
Work not yet advanced to the level that a first proposal could be integrated in the documents in preparation. A general list of competencies required as well as the respective costs with personnel have been presented in the 1st Annual Project Meeting in Amsterdam, based on the experience of other ERICs and on the pay tables of the United Nations.

Task 3.3 Financial aspects of data policy and management
Task leader: UCL/ADS – *Holly Wright*
In order to participate in metadata aggregation initiatives like DIGILAB, heritage science organisations must work to preserve and disseminate their data in a persistent way. To support the adoption of Open Data policies, we must better understand the range of costing models employed by heritage science organisations. With input from the Task 3.3 partners and the E-RIHS consortium as a whole across several annual and midterm E-RIHS meetings, a preliminary report on the financial aspects of data policy and management has been drafted, in preparation for submission by M24 (January 2019). The current full draft can be found at http://bit.ly/2Mwa6sU

The draft report discusses cost models for archives and repositories within archaeology to establish baseline understanding in a diverse sector. This includes an overview and evaluation with regard to usefulness for generating income and contribution to sustainability. The different types of models identified in the report include: 1. National/Regional Governmental Funding (derived, directly or indirectly, from national and regional government, departments); 2. Project Funding (usually for a very specific period of time with specific project outcomes expected by the funder), 3. Subscription Funding (stakeholders attempt to recoup infrastructural costs by charging subscription fees to users, whether individual, libraries or other institutions, for access to some, or all, of their data); 4. Endowment (an intense period of fundraising, or a philanthropic gift, generates a large fund that provides an annual return on investment to keep the resource running permitting project leaders to focus on content development rather than on ongoing revenue-generation efforts); 5. Commercial Partnership (a model that leverages the talents, skills and capabilities of strategic partners outside of the organisation- this collaboration can include informal linking relationships to more formal vendor contracts, increasing the value of a project); 6. Advertising Revenue (the web advertising model is an extension of the traditional media broadcast model in which the broadcaster is, in this case, a web site, provides content and services, mixed with advertising messages), 7. In-kind contributions (partnerships can aid development of sustainable revenue or business models-collaboration between partner organisations may afford access to skills and technologies or negate expensive infrastructural costs and within the context of an ERIC this may be part of the in-kind contributions expected from partners); 8. Multiple Streams (raising revenue from a number of different sources, which can include some or all of the previous models- the implementation of several different funding models aids sustainability, so a threat to a particular revenue stream would not cause the demise of the organisation).

Task 3.4 In-kind contribution: evaluation and accounting strategy
Task leader: CERIC- *Andrea Santelli / Ornela De Giacomo*

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[1] Communication on Mike Mertens' resignment from DARIAH has been delivered to coordination office in March 2018.

The aim of this task is to define a methodology that allows the correct representation and evaluation of the activities performed through a certified accounting of the values involved and the methodology will be finalised to the definition of the value of the goods and services conferred for specific use within the activities of E-RIHS. (In kind contributions – hereinafter called IKC) and to the definition of the overall size of the activities of E-RIHS and resources contributed by the national hubs.

During the E-RIHS PP 1st Annual Meeting, Ornela De Giacomo presented the goals of this methodology with reference to the linked financial aspects as well as the governance aspects (Task 2.1 of the Action); the potential impact of this topic in other Project Tasks/Work Packages; the activities that can be supported through the IKC and the accounting criteria inspired to the administrative obligations related to implementing the Action; an analysis of the benefits and limits of the different approaches suggested (actual costs – fair market values – standard costs) has been presented.

In March 2018, a questionnaire has been distributed among the partners in order to collect their experiences in dealing with the in-kind contributions. The questionnaire, organized in three different parts, focused on the relevance of the in-kind contributions of each institution in E-RIHS, in other joint research initiatives and in other ERICs.

Problems

Task 3.3. As the area of expertise of the author organisation is primarily archaeology, E-RIHS partners were asked at the annual meeting in Amsterdam in February 2018, if they would be willing participate in a short survey to understand the costing models in use across the partnership. This would allow the report to reflect the range of funding models currently in use, and ensure any recommendations were relevant. The survey can be found at https://www.surveymonkey.co.uk/r/B63N3D8.

Achievements

Task 3.1. The following internal documents have been produced and made available to all partners through the E-RIHS PP site on D4Science: Task3.1Doc01vs01 "Financial Model Proposal"; Task 3.1Doc02vs01 "Business Description- sources of revenue at partner level"; Task 3.1Doc03vs02a "Financial Model- cost scenarios". The first document will be the core of the first WP Deliverable to be presented at M24.

Preliminary results have been integrated in the first version of the Scientific and Technical Description of the future ERIC, as described above. Funding model and preliminary cost scenario have been present to the SAB.

Task 3.3. Preliminary report as mentioned above; survey in course.

Task 3.4. Replies from 23 institutions were received to the questionnaire mentioned above.

With reference to the future E-RIHS-ERIC, 35% of the respondents believe that they will be involved in providing access through more than a single platform, contributing mainly with scientific equipment (52%) and database services (26%).

29% of the respondents believe that their organization will contribute providing the right to use/access to databases, laboratories, or other research support. In this context, the methodology that will be proposed will be mainly based also on the rules established by the EU for actions involving trans-national access under the Horizon 2020 Framework Program allowing the use of reimbursement on the basis of unit costs.

25% of the respondents believe that their organization will contribute providing human resources. Same percentage of organizations will provide equipment.

52% of the respondents confirmed that their institution has already adopted a methodology for the definition of the unit cost for the right to use/access.

With reference to the scopes, in 52% of the cases, the IKC are committed to support the technical and scientific activities: 15% of the respondents confirm that their own organization is using the in-kind contributions model, mainly adopting a methodology based on actual costs (75%), to define the voting rights of the governing boards.

In general, the prevalent methodology adopted is based on actual costs (62%). Regardless of the methodology adopted, 67% of the institutions of the respondents audit their costs.

Next steps: a follow up of the IKC practices adopted by the project participants (deadline: December 2018); the drafting of a methodology based also on the results of the shared questionnaire (deadline March 2019).

1.2.4. <u>Work package 4: Legal work (CNRS)</u>

This Work Package aims to provide a set of documents for the establishment and the operation of E-RIHS ERIC. Because of the far-reaching implication of its content, all the work carried out during this reporting period was very closely related to the progression of the work carried out under WP2 (Governance) and WP3 (Financial Planning), as well as to the drafting of the access policy (WP5) and the setting up of an Interim Governance between the end of the Preparatory Phase and the official start of E-RIHS ERIC (WP11). This Work Package is also exploiting some work carried out in the WP12 (Sustainability) of IPERION CH, because E-RIHS aims at delivering a perennial infrastructure where the legacy of the former Heritage Science related H2020 projects would live on.

The division between the tasks of this WP accurately reflects the overall timing of the E-RIHS project: the Memorandum of Understanding addresses issues related to the transition phase and is to be sent to the prospective Members of E-RIHS, the Statutes are then required for both the submission of the Step 1 to the European Commission and for the operation of the ERIC, and the last two tasks should ensure a smooth operation of the ERIC.

All the work achieved under this WP followed a common methodology. First, a time of information gathering and comparison of what has already been done by other distributed infrastructures, then a first attempt to adapt these findings to E-RIHS while paying attention to the evolution of the other WP of the E-RIHS PP, and then a phase of constant back and forth with the other participants and stakeholders of E-RIHS. Because of the logical connection between the topics, some tasks are more advanced in this process than others.

The several E-RIHS PP meetings throughout this reporting period were used to communicate and discuss about the products of this Work Package, and emails and videoconferences were used to advance the work between meetings. Some participants in this WP4 were also able to resort to external advice in order to improve the likelihood of a quick adoption of the documents by the future members of E-RIHS PP.

Task 4.1 Memorandum of Understanding
Task leader: KIK-IRPA – *Hilde De Clercq*
At first, the IPERION CH deliverable providing a comparison between various possible legal entities for E-RIHS was discussed pre-emptively among E-RIHS PP partners and stakeholders. This enabled

the decision of ERIC being the preferred legal entity for E-RIHS. Based on that decision a template of the Memorandum of Understanding (MoU) was setup, based on already existing MoU's that were gathered and compared. The purpose of the MoU is to state the intent of the signatories to take the necessary steps towards the construction and operation of E-RIHS in its legal form (ERIC) and facilitate continued discussions during the Transition Phase. The MoUs is open for signature to entities representing Member States. Signing of the MoUs by committed countries aims at securing the transition phase between the preparatory phase and the entering into force of the infrastructure.

The actual proposal of E-RIHS MoU, setup in close collaboration with the WP leader, further includes the scope of E-RIHS, aspects related to the legal model adopted and resolution of conflicts. A first version was discussed among partners and at the SAB meeting in Amsterdam in February 2018. After that, SAB members had the time to review and give comments for a revised version to be presented in the next E-RIHS meeting (September 2018).

Task 4.2 Statutes
Task leader: CNRS (C2RMF) – *Isabelle Pallot-Frossard*
The goal of this task is to produce the statutes of E-RIHS ERIC, one of the documents requested to start a step 1 application to become an ERIC. The work carried out in this task will have a significant impact on the final state of the infrastructure. This is why one of the first actions conducted for drafting the statutes was to study every ERIC statutes, their evolution through time, and the way they are applied. This took the form of a report called "The Statutes of active ERICs: lessons for the future E-RIHS statutes" that covered all essential elements of the statutes of all active ERICs. This work leading to this report was also done with due consideration to WP2 (Governance) and WP3 (Financial Planning).

This general comparison enabled us to observe how the current ERICs interpreted and used the different possibilities offered by the ERIC regulation and the official guidelines. This work leads us to determine the scope and the level of details that we ought to give to the E-RIHS ERIC statutes, with due attention to the other tasks of WP4 and the work carried under other Work Packages.

Drafting the statutes began with creating a structure with seven chapters and three annexes. The names of the chapters and the number of articles in each chapter was discussed by email and during a dedicated session in the first annual meeting in Amsterdam. The resulting "table of content" was used to highlight all the semantic choices we had to make, and all the remaining aspects of the essential elements of the infrastructure we had to negotiate. It provided a rough governance structure. This table of content is updated every time there is a change in the structure or the statutes or in the names of articles.

The next step was to draft the content of the articles, which was itself performed in two periods. First, we created documents comparing the drafting of every comparable article in the other ERIC statutes, and we usually used either an averaged version of the other statutes to draft the E-RIHS articles. Sometimes, an article of a specific ERIC statute was standing out as very well drafted and close to our own project so we adapted it into an E-RIHS article instead of the averaging technique. Second, we sent these newly drafted articles to the other WP4 participants in an exercise of constant back and forth. This leads to several versions of the draft E-RIHS statutes that were eventually sent to the other stakeholders in E-RIHS PP, as well as to create a version and comment tracking system.

The latest iteration of the draft E-RIHS statutes at the time of the end of RP1 is the version 1.6 and is destined to the SAB members. It now features a preamble and cover note summarizing the remaining negotiation topics and semantic choices.

Task 4.3 Internal Rules and Procedures
Task leader: RCE – *Jan Van't Hof*
The work on task 4.3, strongly linked to Task 4.2 is getting started since at the moment we have important drafts available on the governance structure and the statutes. In September, the work on this task will commence based on these drafts and on the outcome of the discussion during the last meeting (Warsaw, September 2018).

Task 4.4 IPR management
Task leader: FORTH – *Dimitris Kafetzopoulos*
Understanding the importance of Intellectual Property (IP) for various Heritage related affairs and for the operations of E-RIHS we have directed our efforts towards the following objectives: a) Define and describe the variety of IP related issues within the Heritage domain, b) Describe the framework of guidelines, directives, legislation, practices related to IPR management, c) Identify any sensitive or controversial issues related to IPR management, d) Raise awareness for IPR issues among the partners, e) Analyse the landscape of various national IPR legal & regulatory frameworks, f) List the IPR management and Technology Transfer Offices operating in the partner organizations, and g) provide support, recommendations and guidelines about IPR management for the research infrastructure.

To this end, there are four main deliverables that are presently under preparation: 1. A comprehensive presentation about various concepts and issues of IPR within the Heritage domain, 2. A brief description of IPR, legislations, directives and guidelines accompanying a questionnaire about IPR related issues, 3. Recommendations for IPR management within the E-RIHS, and 4. Publications in scientific journals or conference proceedings about IPR specific issues.

Concerning the IP issues and respective Rights, there are two main domains that can be identified and are related to the operation of a heritage research infrastructure i) the IPR associated with the heritage objects themselves, either tangible or intangible, and ii) the IPR arising from the operations of the research infrastructure. Within the first line of IPRs various concepts, issues, rights and limitations are discussed, including ownership, possession, excavation, publication, ethics etc. Within the second line of IPRs are discussed mainly copyrights and protection of inventions.

The questionnaire is built mainly towards the following objectives: i) Identify existing expertise, guidelines, agreements, documents and protocols currently in use by partner institutions and cultural specialists, ii) Gather information on intellectual property issues, differences in regulatory framework, sensitive issues and practices in the various member states and partner organizations, and iii) Gather information on intellectual property-related concerns and needs in the heritage domain.

Finally, a conference proceedings article has been presented and published in the "Intangibility Matters: International conference on the values of tangible heritage in Lisbon May 29-30, 2017 (IMaTTe) analysing the specific topic of "Heritage considerations and challenges from ancient DNA analysis: A preliminary approach expanding from the Greek legal and ethical network" by Eugenia Tabakaki & Dimitris Kafetzopoulos.

Problems

Problems are eventually explained in the state of the work carried out.

Achievements
Achievements are explained in the state of the work carried out in the tasks.
MS 2 was achieved in time.

1.2.5. Work package 5: Access and interoperability Policies (PIN)

State of the work carried out
Overall. The overall WP progress has been steady under most regards. The focus has been on the "new" aspects, considering that, for example, the access policy to physical labs (both from the users' perspective and from the providers' one) may rely on the long experience of CHARISMA and IPERION-CH. Thus, the effort has mainly concerned the digital aspects, which are relatively novel not only for E-RIHS but also for the research domain in general. The interrelation and integration of the Tasks is high, so work may be regarded as taking place under different Tasks but eventually producing a combined result. Attention has been paid to the global debate concerning data, their use and re-use, their quality and the technological means that enable data-centric research. This allows the production of results aligned with EU data policies and will enable, in the future, cross-disciplinary interoperability, which is a natural trend for a multidisciplinary infrastructure as E-RIHS.

Task 5.1 User strategy and access policies
Task leader: CNRS – *Claire Pacheco*
A preliminary description of the access policy concerning ARCHLAB, FIXLAB and MOLAB has been prepared and discussed since summer 2017. Two meetings have been dedicated to finalization, and the final version of the document is expected by early October 2018.
DIGILAB has been dealt with separately, due to its virtual nature, and the initial design has been agreed with the subtask leader and presented to the SC in several meetings. The design has also been summarized in a contribution to the project scientific vision document, including both data management aspects (F. Niccolucci) and the use of visualization tools (J. Padfield). Also Permanent Indicators (PID) are being addressed, participating in the dedicated GEDE initiative promoted by RDA (Research Data Alliance).
The approach chosen for DIGILAB considers separately the different technologies used in Heritage Sciences and the data they produce, to specify the overall data model. A first test implementation will then be created and used to check the model validity, understand the necessary adjustments and have indications on the related costs. The test model will also be used to homogenize the data approaches of the E-RIHS partners, so far grown up independently from each other.
Being a relatively novel tool, not only for E-RIHS but also in the overall research panorama, attention has been paid to the scientific validation of the proposed design. It has been presented at an international workshop in Cyprus, organized by the partner CYI at the end of June, and two papers have been accepted in international Conferences, the first one being the CIDOC International Conference (Crete 1-5 October) and the second one Digital Heritage 2018 (San Francisco, 26-31 October).

Task 5.2 Complementarity and integration of E-RIHS

Task leader: UCL / NG – *Marika Spring*

Much of the work reported above regarding Task 5.1 actually concerns also this task, as in the preliminary stages it has appeared more efficient to develop in parallel the two perspectives, the user's and the provider's one. So, we refer to the previous section also for this task.

Task 5.3 Standardization and interoperability

Task leader: DAI- *Wolfgang Schmidle*

This task is closely related to the design of DIGILAB. It has so far produced an adaptation of the general data model – the PARTHENOS Entity Model (PEM) – to the E-RIHS needs and has started working in the different technologies used in Heritage Sciences to generate the related mappings. So far, the results obtained concern XRF, dating, and multispectral analysis. More cases are scheduled to be progressively addressed in the next future.

Task 5.4 Data curation

Task leader: UCL / ADS – *Holly Wright*

Work under this task must keep into account and participate in global activities concerning data quality, data FAIRness, long term preservation and so on. These are general problems affecting all scientific domains, and through this Task E-RIHS aims to proceed in a compliant way with global initiatives. The Task leader participates in an initiative on data quality which aims at addressing repository certification, named CoreTrustSeal. A product on which work is ongoing is a template for the Data Management Plan produced by the PARTHENOS project, which requires to be adapted to the specific needs of Heritage Science research.

Task 5.5 Synergies with RDA, EOSC and e-infrastructures

Task leader: PIN - *Franco Niccolucci*

This task concerns liaising with global initiatives on data. As regards RDA, the Research Data Alliance, E-RIHS is active through the participation in the GEDE group on Permanent Identifiers, where J. Padfield is an active member as well as the project coordinator and the WP5 leader. Collaboration with e-infrastructures takes place through the presence in EOSCpilot, a project devised to establish research needs and convey them into the EOSC design. This is provided by the WP leader.

Problems

Although it might be expected that the access policy finalization would have been straightforward as it could rely on the experience gained within IPERION-CH and its predecessor projects, this has not always been the case. This probably depends on the more detailed knowledge partners have of the related issues, and to the difficulties met in synthetizing a shared view on them. Some organizational issues have also affected the finalization of a joint document on this aspect. Measures have been taken to guarantee that a common E-RIHS position on the matter is defined by early October.

Achievements

Results obtained are described in the Task description. They are summarized below.
- Work in progress on the Access Policy, with a deadline for finalization
- DIGILAB design and validation, recovering a good part of the delay due to its novelty
- Scientific papers presented at Conferences

- Specific aspects addressed in a valid way, e.g. the proposition of PIDs (National Gallery), first mappings for interoperability (FORTH and PIN) etc.
- Collaboration with and participation in global initiatives such as the RDA GEDE group, the CoreTrustSeal quality assurance initiative, the EOSC design, and so on
- Exchange of knowledge with other projects such as PARTHENOS (as concerns data policies and the data model).

1.2.6. Work package 6: Sustainability (ITAM)

State of the work carried out

The WP6 is focused on sustainability of the new E-RIHS aiming at achievement of the following objectives: i) set up plans to integrate harmoniously the new entity into the European research planning and funding programmes, building on the assessment of E-RIHS socio-economic impact and a cost-benefit analysis; ii) support human resource sustainability; iii) lead to the creation or consolidation of centres of excellence and/or 'regional partner facilities'; iv) identify and configure new or update related facilities; v) ensure pan-European coverage and be prepared to "go beyond Europe"; vi) Explore national and regional policies for fund raising; vii) coordinate and optimize strategies for sustainable investment policies.

The work is carried out in five tasks: 1) Integrating E-RIHS in European funding instruments and joint programming initiatives; 2) Synergies with related EU bodies and initiatives; 3) Achieving sustainable pan-European coverage; 4) Implementing E-RIHS: cost-benefit analysis and impact assessment; 5) Investment policies for the lifecycle of E-RIHS including its transition phase.

According to the plan the work on socio-economic impact and cost benefit analysis is materialized taking advantage of an external sub-contracted subject specialized in these types of endeavours. The required content of the outsourced work was prepared and discussed with the project partners at the Amsterdam project meeting to the following extent. The sub-contracted subject is to provide a CBA „test" carried out with respect to a specific investment passed when the related expected benefits exceed socio-economic costs, i.e. when the NPV > 0, meaning that that investment is expected to produce benefits to the society as a whole. Provision of the GANTT, i.e. clarification of all the phases considered necessary by the tender to carry out the CBA analysis within the related time-frame. Identification of E-RIHS stakeholders, i.e. mapping out all potential direct and indirect stakeholders, provides additional information and justification on how they could be affected by E-RIHS. Literature review and empirical studies could be beneficial to support the current stakeholders' identification. Further, identification of benefits with respect to identified stakeholders, i.e. with respect to the previously identified stakeholders, the tender will also highlight which potential benefits E-RIHS will provide to stakeholders. Indicators and measurement metrics to assess benefits are also required. Identification of costs for detected stakeholders, i.e. with respect to stakeholders, the tender will identify potential costs – and related measures and indicators to assess them. Definition of the CBA model for RI, i.e. definition of the theoretical model that considers costs and benefits previously identified. Data collection and analysis, i.e. clarification of methodologies for data collection, data sources and data Analysis. Estimation of benefits, i.e. provision of benefits' estimation according to the CBA model previously defined. Estimation of costs, i.e. provision of costs' estimation according to the CBA model previously defined. Final estimation of the NPV (Net Present Value).

In the socio-economic part, the aim of assessing the direct and indirect socio-economic impact of E-RIHS is required including provision of the GANTT, i.e. clarification of all the phases considered necessary by the tender to carry out the socio-economic impact assessment and related time-frame. Similarly, the definition of an RI socio-economic impact is required; i.e. literature review and review of empirical works to provide a comprehensive definition of RI-socio-economic impact that will guide the identification of performance dimensions and related measures. Further requirements involve preliminary analysis of the state of the art with respect to socio-economic impact assessment of RIs; i.e. based on the previously provided definition of a socio-economic impact assessment, the tender will provide a synthesis of previous work on the RI socio-economic impact assessment and, based on that, it is to provide a set of performance dimensions and related metrics that will be evaluated during the project. Definition of a methodology of investigation, i.e. explanation of the research approach (e.g. qualitative, quantitative, multi-methods), data collection process, sources of data and data analysis strategy. Provision of E-RIHS socio-economic impact dimensions, i.e. provision of a report in which all the performance dimensions considered to evaluate impact are described and justified. Definition of E-RIHS impact indicators and related value, i.e. provision of a report in which, for each of the performance dimensions, a set of quantitative indicators is presented and described.

During the monitoring period a public tender has also been prepared from the technical point of view and launched with a short delay. Seven companies expressed officially their interest in participating. Until May 18, 2018 (23:59) the companies had time to prepare their offer, on the basis of which the tender was evaluated and awarded. The offers had to be structured based on the Requests for tender prepared within Task 6.4 and published in the call for tender. Only two companies submitted their offer: SINLOC- SISTEMA INIZIATIVE LOCALI and CSIL CENTRO STUDI INDUSTRIA LEGGERA SCRL. An evaluation committee was established by the project coordinator in the following composition: Miloš Drdácký (Chair), Francesco Taccetti, Jana Striová. In the tender specification the following criteria were defined: a) Previous experience and similar published works in CBA Analysis; b) Previous experience and similar published works in socio-economic impact assessment; c) Previous experience and similar published works in cultural heritage; d) Professional experience of the individuals involved; e) Research proposal: Methodological approach (qualitative vs quantitative vs multi-methods) (10%) - Clarity of the research design (e.g. identification of phases, definition of the time horizon) (10%); and f) price. The first five technical criteria were graded by June 12, 2018 after the opening of the envelopes on June 4, 2018 at 13:11. The offer by CSIL achieved 70 pts (15+11+8+19+17), and that of SINLOC 53 pts (7+8+7+17+14). The economic data were evaluated later (June 13, 2018), and CSIL received 19.57 pts, SINLOC 20 pts. The winning CSIL company is due to deliver a methodological report "Socio-economic impact and cost-benefit analysis of a European Research Infrastructure for Heritage Sciences". This work relates Deliverables D.6.1. and the INFN is responsible.

Another close deadline for the Deliverable D.6.2 (M24) influenced focusing the first period work on the sustainability document for the business plan of E-RIHS under the responsibility of KIK-IRPA. The first draft will take into account the recent SWD requirements or recommendations and reflect Sofia Conference Conclusions. It is expected to be distributed for internal discussion to the project partners in September 2018.

An important effort during the first monitoring period was devoted to the study of the recent EC document "Long-term sustainability of Research Infrastructures", (SWD (2017) 323 final), which identifies main long-term RI sustainability challenges based on outcomes of consultations with stakeholders and ESFRI meetings and workshops. (Issued 26 September 2017). The SWD (2017) 323

final document revealed important shortcomings, problems and barriers, and suggests some ideas for their removal in future. Its conclusions influence sustainability planning of the E-RIHS and is carefully considered.

Task 6.1 Integrating E-RIHS in European funding instruments and joint programming initiatives
Task leader: KIK-IRPA – *Hilde De Clercq*
The main activities related to the development of cooperation with the JPI CH (Joint Programming Initiative Cultural Heritage). Harmonized procedures that are in alignment with the Joint Programming Initiative Cultural Heritage were the focus of the Task. It involves exploitation of opportunities for joint projects or submission of proposals for JPICH calls. Among the common interest are also possibilities for funding mobility of RI staff and users and Important cooperation is developed in planning of a future Framework programme discussing a possible CH Mission. The following JPI CH representatives were nominated in a working group preparing the joint activities: Emilio CANO (MINECO Spain), Hilde De CLERCQ (KIKIRPA Belgium), Cristina SABBIONI (representing the JPI CH Coordinator), Jan VAN´T HOF (RCE The Netherlands), Pascal LIEVAUX (MCC France), moreover, the WP6 Leader Miloš DRDÁCKÝ is also involved by his membership in the GB as well as EB of the JPI CH. For E-RIHS, the interface group is rappresented by (M. Drdacky, I. Pallot-Frossard, L. Pezzati).

Task 6.2 Synergies with related bodies and initiatives
Task leader: CSIC – *Emilio Cano*
Major progress was achieved with regard to cooperation with the intergovernmental organization ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) where an agreement of cooperation proposal has been prepared.

Task 6.3 Achieving sustainable pan-European coverage
Task leader: ITAM – *Miloš Drdácký*
T6.3 aims at identification of new suitable and willing partners within Europe and beyond. Thus institutions in the European Higher Education Area (EHEA) are promising important partners for concerted endeavours for securing funding for E-RIHS because the 2017 Conference of European Schools for Advanced Engineering Education and Research (CESAER) expressed a need for dialog with the EU on emerging topics including – amongst others - safeguarding the long-term sustainability of research infrastructures and assuring the leading position of European knowledge worldwide and increasing excellence in education and research. Therefore, negotiations with the EHEA were proposed.

Task 6.4 (Implementing E-RIHS: cost-benefit analysis and impact assessment) and **Task 6.5 (Investment policies for the lifecycle of E-RIHS including its transition phase)** are currently under implementation.

Problems
The tender was evaluated with a short delay due to some administrative reasons and, therefore, the contract with the selected company has been signed on July 31, 2018. The work should is planned to be finalised by the end of November in order to provide enough time to the other project partners to finalize deliverables due by month 24.

Achievements

1. The materialization of a tender and a selection of a sub-contractor for Task 6.4 and Deliverable D.6.1.
2. A proposed cooperation agreement with ICCROM.
3. The joint project proposal "XSPECT" with the JPI CH in response to the H2020 call SC5-19-2018 "International network to promote cultural heritage innovation and diplomacy" was submitted and highly ranked, but was put on a reserve list however, due to a shortage in budget.
4. The proposal within a INFRAEOSC-04-2018 call named SSHOC (Social Sciences & Humanities Open Cloud) a new EOSC cluster project is under evaluation.
5. The proposal RECHARGE, within TOPIC: Resilience and sustainable reconstruction of historic areas to cope with climate change and hazard events, LC-CLA-04-2018 has passed STEP1 evaluation.

1.2.7. Work package 7: E-RIHS Academy (UCL)

E-RIHS Academy is a key component of the future operational success of the research infrastructure. Heritage science is a uniquely cross-disciplinary discipline combining knowledge and skills encompassing a range of domains from science and engineering, through arts and humanities to social sciences. Heritage scientists not only need to have an interdisciplinary outlook but also need to possess skills enabling them to work in scholarly settings, heritage organisations as well as in business environments. This work aimed to explore the current education and training landscape and to develop a strategy for education and training in E-RIHS.

The preparatory phase, aiming to create the foundations for E-RIHS training and education activity, has set the following objectives:
- Identify education and training needs concerning E-RIHS users as well as personnel
- Liaise with national and international professional bodies to explore education and training needs
- In coordination with the national hubs, develop a strategy of comprehensive provision of education and training – E-RIHS Academy
- Develop a template for the design of cross-disciplinary education and training with learning needs and outcomes
- Devise a plan for education and training follow-up.

The partners within this work package have been working on the design, delivery and reporting of the needs landscaping report. The final report (D7.1) has been presented and approved by the wider E-RIHS PP community during the E-RIHS PP interim meeting in Amsterdam. In addition, WP7 has been building partnerships with other heritage organisations and training providers such as ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) and PARTHENOS (Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies). Lastly, the WP7 task leaders have prepared a draft training strategy to be presented and discussed by E-RIHS PP community during the next preparatory phase meeting in Warsaw (5-7 September 2018). It is expected that the final deliverable (D7.2 E-RIHS education and training strategy) will be completed ahead of the deadline [M30].

Task 7.1 Assessment of education and training needs

Task leader: IPCHS – *Polonca Ropret*

As part of the assessment of educational and training needs, the partners have developed an mixed-method survey in order to understand the landscape of heritage science training provision from the viewpoint of both users and providers of access to infrastructure services.

To design the questionnaire we liaised with partners within E-RIHS that have experience from previous EU infrastructure projects, as well as partners with experience of training provision e.g. in ARIADNE, CHARISMA, IPERION CH and other similar projects, as well as with ICCROM. This enabled us to build on extensive joint experience of designing and delivering training. As a result, 51 questions were developed, focusing on scientific and technical education as well as on training in cross-disciplinary skills. The aim of this questionnaire was to understand the needs and expectations regarding heritage science training and the broader landscape of training provision in heritage science. The survey was distributed online using SurveyMonkey. In order to distribute the questionnaire between users and providers we liaised with other providers of education and training in HS, museums, galleries, restoration/conservation institutions, and HS research institutions. Social media were used to disseminate the survey, and direct email notifications were sent to members of professional associations such as ICON – UK Institute of Conservation. In total, the survey comprised 282 respondents.

In order to complement the quantitative data, we organised a set of qualitative interviews. The respondent group included four representatives of international heritage organisations (IIC, ICON, ICCROM, ICOM CC), two coordinators of early career research programmes in heritage science (SEAHA and Marie Curie Actions), and representatives of the provider community as well as national heritage boards. We liaised with other providers of education and training to explore and analyse the current offer of education and training. Due to scheduling constraints, the possibility of organising a focus group was limited. Instead, the interview method has provided a unique opportunity to explore the matters of training and skill needs. Through in-depth discussions lasting between 30 mins and 1 hour, we were able to gain an understanding of the contextual factors that could affect skills development. First, the semi-structured interviews have predominantly focused on gaps in heritage science training. Second, they explored the need for provision of specific skills that may become essential in the future and day-to-day activities of the ERIC, and the most effective means by which E-RIHS training could be delivered. Last, they explored how the existing formal training responds to industry needs and how multidisciplinarity is addressed in formal academic education. As a result, we delivered a report on education and training needs (D.7.1) that informed other developments of E-RIHS Academy.

Task 7.2 User-focussed training and Task 7.3 Training of E-RIHS personnel

Task leader: ITAM – *Michal Vopálenský,* Task leader: UCL / NTU – *Haida Liang*

Following the insight developed in the landscaping report and a literature review on future skills' needs and EU cooperation in education and training strategy, we have drafted a strategic document outlining a vision for the education and training activities for E-RIHS users, providers and research infrastructure managers. This strategy has been calibrated by other E-RIHS internal strategies and external evidence. The key guiding influence was the E-RIHS Scientific Vision and its priority areas and core values, in particular the emphasis on competencies, responsible and ethical research, and excellence. The training offer of the E-RIHS Academy reflects these values, supporting

interdisciplinarity, co-creation, ethics, communication, innovation, complementarity, interoperability and quality user experience.

The second shaping factor was the current training needs, identified in the E-RIHS Academy research report (D7.1). This insight, along with a review of future skill needs in the heritage context, raised important questions about how to develop a future-proof, cross-disciplinary and supportive training ecosystem. Much of this strategy, and the delivery channels in particular, are a response to the E-RIHS needs assessment. The primary aim of this strategy was to ensure that we invested our resources into creation of a training experience that enriches the quality and pushes the boundaries of collaborative heritage science research without encroaching on established delivery of formal training.

The strategy draft includes the following key components:
- The context in which this strategy has been shaped, including previous insight about training needs, required skills and the wider E-RIHS PP strategic context (from scientific vision to communication strategy)
- The key strategic objectives for E-RIHS educational and training activities
- A framework strategic approach to guide E-RIHS decision-making about establishing or reinforcing appropriate training activities and programmes at international, and national levels of the E-RIHS community
- A training offer, designed in accord with the strategic approach, and in response to the particular education and training needs identified by the needs' assessment, presented in the E-RIHS Education and Training Needs report (Deliverable 7.1). This presents a mix of training formats to suit the diverse needs of the community, and different career stages
- Resource and material requirements for realisation of the overall objectives of the E-RIHS Education and Training Strategy
- Indicators against which progress will be measured.

This draft will be presented by the work package leader during the forthcoming E-RIHS PP meeting in Warsaw. Following a round of feedback and community reflections, we will submit the final version of the deliverable (D 7.2) by the project deadline (M30).

Task 7.4 Education and Training outreach: E-RIHS Academy
Task leader: UCL – *Matija Strlic*
The core aim of this task is to develop an information system to reach out to users of E-RIHS and to coordinate a comprehensive programme of education and training events and resources, including webinars (to link to WP10). The work package team is currently working in collaboration with the PARTHENOS CH training suite to add content to the platform and enhance the wider cultural heritage training offer as well as include E-RIHS specific content. We are organising a training workshop on 14 January 2019 to develop the guidance to future course organisers and liaise with training providers. In collaboration with WP10, this workshop will also include a planning activity for the E-RIHS alumni network (those undertaking training organised by ERIHS), with who we would continue to explore collaborative ties and organise a programme of follow up activities. Lastly, we are preparing the foundation for a FutureLearn MOOC course (massive open online course) to educate and train future users specifically in cross disciplinary research skills, as indicated by D 7.1.

1.2.8. Work package 8: E-RIHS services for Heritage Science (CENIEH)

WP8 deals with services to be provided to Heritage Science Scholars within the future European Infrastructures for Heritage Science, E-RIHS. The main objectives of WP8 include: a) widening the scope of E-RIHS service provision to new communities, b) involving relevant and complementary service providers, c) designing new services to fill the prioritized gaps, and d) running feasibility studies on new cross-community services ensuring highest efficiency for beneficiaries. Three main tasks are assigned to achieve these WP8 objectives.

Task 8.1 Services for new communities of users
Task leader: CENIEH – *Mohamed Sahnouni*
The purpose of this task is to grow the E-RIHS services with the objective of providing comprehensive support to the Heritage Science communities. CENIEH is working on establishing an inventory of services for E-RIHS related to the study and interpretation of cultural heritage by the following communities:
- Paleoanthropology: The study of Human Evolution based on early Human fossils from Miocene to Late Pleistocene (8 Ma to 10 Ka).
- Archaeology: Study and interpretation of artefact and bone assemblages excavated from prehistoric sites.
- Conservation: Preservation of heritage remains (artefact assemblages, bone assemblages, ceramic, and other archaeological remains).
- Social Sciences and Humanities: Ethnography, Zooarchaeology, Prehistoric art, Paleography…

An initial list of services for Paleoanthropology community has already been set up by CENIEH and SUERC prioritising their services. This includes Dating Techniques (Radioactive decay-based, Trapped charge, and Incremental), Biostratigraphy, Isotope Analysis and material characterization (spectroscopy and microscopy techniques, thermogravimetry and X-ray and multi-elemental analysis).

Also, a first and short questionnaire has been sent to all partners in order to gather the information of services offered by their institutions or laboratories that can potentially be part of E-RIHS in the future. So far, we have received the filled out forms from ITAM, CYI, LNEC and CSGI. On the other hand, the same survey is being sent to other centers and institutions that could contribute with their services to the E-RIHS portfolio. All of these new services will be included, adapted and designed in 4 subtasks:

Subtask 8.1.1 ARCHLAB (Subtask Leader: KIK-IRPA).
The subtask leader reports that the most significant information regarding the up-to-date ARCHLAB offer is summarized on IPERION CH website. It is evident that the actual ARCHLAB ACCESS within IPERION CH is more focused on "material-science" of works of art. Opening the access scope towards paleoanthropology and other social science and humanities will enable to enlarge the research communities in general and stimulate applications in the field of f.e. art history, archaeology, as well as digital humanities.

Cross-disciplinary approach needs further explored, accessing users from the fundamental science (chemistry, physics and informatics) to whom the benefits of ARCHLAB ACCESS opportunities are communicated.

In terms of crossing disciplines, a perfect example obtained within IPERION CH showing the marriage of the worlds of fundamental science and applied science is the application from the Department chemistry of the university of Hamburg having an international renown knowledge and experience

in the crystallization behavior of salts and this from a thermodynamic and kinetic point of view, explaining the fundamental and theoretical behavior of salts in conditions of temperature and relative humidity, however not explaining practical degradation phenomena in case these salts are present in building materials. The salt expert was faced with a problem of yellowing of gypsum efflorescence appearing on mural paintings. Having almost no experience in the field of conservation science, the user applied for access to an ARCHLAB provider being a research institution having a long experience with conservation problems. As such 'innovation' was brought in into ARCHLAB, enabling a widening of knowledge in both directions (fundamental science vs applied science and vice versa) thanks to exchange and sharing of information between user and provider.

Another example is related to exploring the Statistical software available in SPK to understand complex µ-XRF and Raman Analytical data on 7 Medieval Champlevé enamel objects from Berlin Museum.

Subtask 8.1.2 DIGILAB *(Subtask Leader: DAI).*

No progress to report at this time.

Subtask 8.1.3 FIXLAB *(Subtask Leader: ATOMKI).*

The current FIXLAB within the IPERION CH project consists of large scale facilities, such as particle accelerators, a neutron, as well as a synchrotron facility. It is often assumed that only access to these, relatively uncommon techniques requires concerted action on the European level, but users have shared their experience about the difficulties in accessing other types of facilities, too.

To search for the hiatus in and the possible extension of the methodological repertoire of the E-RIHS, two approaches were applied:

(1) Browsing in the list of the analytical techniques and the study areas of institutions involved in the potential national nodes. It also has to be considered that laboratories with experience in cultural heritage research are preferred, since we aim to offer not just techniques but expertise. This can be controlled by surveying the publications.

(2) From the point of view of the users, several main topics of cultural heritage research can be differentiated, such as provenance analysis, technology analysis, functional analysis, anthropology, field archaeology, dating, experimental archaeology, conservation, restauration, heritage protection / preservation, authenticity investigation. Subtopics within the main fields and questions of interest can also described, with many overlapping analytical problems and applicable techniques.

To extend the capabilities of FIXLAB to cover more of these fields, currently not involved large scale facilities can be recruited, such as AMS, on one hand. On the other hand, FIXLAB should not be restricted to large scale facilities but medium scale facilities and complex laboratories of standard techniques should also be involved. Besides the new possibilities already identified, the need for an NMR laboratory, a complex chemistry laboratory, and the "fix" version of MOLAB techniques are the most often expressed ideas by our contacts. To match demand and offer, a table of fields, techniques and possible providers is being prepared.

Subtask 8.1.4 MOLAB *(Subtask Leader: CNR).*

Starting from how the MOLAB platform currently operates within IPERION CH (following the EU charter for Access to RI), the work to be done now for E-RIHS PP is to envisage a policy to include more laboratories that can offer advanced methods and expertise on non-invasive *in situ* analysis while guaranteeing a high quality and a high level of integration of the services. Based on the subtask leader´s opinion, what we need to do is to keep some possible new types of access provisions and cross them with the interested labs participating in ERIHS PP.

The new scientific communities, suggested by the subtask leader, are Paleontology (spectroscopic methods, hyperspectral imaging optical tomography, laser scanning, photogrammetry...), Underwater Archaeology (underwater LIBS, underwater Raman spectroscopy), field Archaeology (UAV-based multispectral imaging, UAV-based thermography, UAV-based LIDAR...) and Surveying and Monitoring for Vulnerability of Ancient Buildings (Multiscale and multisensor approach for the structural diagnosis of ancient buildings).

One of the next steps is discuss about logistics and coordination with participants of E-RIHS that have already expertise in those fields.

Task 8.2 Feasibility studies
Task leader: PIN – *Franco Niccolucci*
In this task small feasibility studies will address the viability and manner of eventually incorporating potential new services, ensuring maximum efficiency for each interested beneficiary community.

Subtask 8.2.1 - ***Multilevel analysis: Identification, Digitization and Reconstruction.*** *(Subtask leader: FORTH).*
In September 2017 the subtask leader confirmed that his team has started work on the Archaeogenetics scenario and they expect to deliver the work according to the schedule. Nevertheless, they would like to somewhat expand the initial focus of the 8.2.1 feasibility study to include "Genetics studies for elucidating origins, migrations, environments and relations of ancient populations" possibly under the general title "Archaeogenetics and Bioarchaeological studies for ancient individuals and populations".

Subtask 8.2.2 - ***Universal chronology service*** *(Subtask leader: CENIEH).*
CENIEH and SUERC are working on this task and the main activities include:
- Inventory of dating techniques (completed). It includes three broad categories of techniques: Numerical Dating, Incremental Dating, and Relative-Associative-Evaluative Dating.
- Inventory of experts (on-going, good advancement): Preparation of a list of scientists in charge or associated with laboratories.
- Inventory of laboratories (on-going, good advancement): All 14C, TCN, Luminescence and ESR laboratories have already been inventoried.
- Some potential issues identified, with mitigating actions: A number of possible issues are raised including: Continuity of experts and laboratories due to various reasons, animosity issues between laboratories, Protocols standardization.
- Inquiring feasibility of participation: partially done, several laboratories have not answered the inquiry. It is planned to use a formal questionnaire and official approach in order to obtain specific information and feasibility of participation.

Subtask 8.2.3 - ***Workflow in Digital Archaeology and Analytical Methods*** *(Subtask leader: CYI).*
Subtask leader reports on a couple of ideas:
- Implementation of an approach, that allows users to interact with the 3D models and perform various measurements to solve discrepancy between the amount of 3D data collected in the field and its quality.

-    Improving the functionalities of interaction with the 3D content, and looking into the IPR propagation for exploitation potential of such data by various communities of interest and how to integrate the browser-based visualisation within a 3D digital repository platform, also as a future service component within DIGILAB.

Subtask 8.2.4 - *Reference collections* (leader: RCE).

This subtask will investigate how such collections may be mass-produced and/or virtualised to offer different scientific communities an easier availability of such important research tools and guidelines for their use.

As part of this subtask, we would like to make an inventory of demands with regards to specific materials, samples etc. as reference materials or for round-robin testing with (potential) consortium members. Moreover, we want to make an inventory of the collections that are present with (potential) consortium members that may be available for one or more of the following: 1) as reference dataset, 2) as digital reference database, 3) to be digitized to contribute to reference database, 4) as source for samples for reference collections, and 5) as source for samples for round-robin testing.

We will base the design and execution of the actual feasibility test on the result of this questionnaire, e.g. which objects/materials/samples/databases to use, and who we want to invite to participate.

Subtask 8.2.5 - *Integration of scientific data with general heritage documentation.* (Subtask leader: PIN).

Here a short description of the last period activities:
-    Identification of existing tools and services to foster interoperability among Heritage Science communities and to establish cross-disciplinary information integration.
-    Survey of existing international scientific metadata standards, specific vocabularies and data formats in use by various research laboratories and institutions.
-    Feasibility study for adaptation and reuse of existing conceptual models for the semantic encoding of scientific information.
-    Preliminary definition of a scientific metadata model for enhancing integration of Heritage Science data and creating interoperability with Cultural Heritage documentation.

Subtask 8.2.6 - *Advanced materials for restoration* (Subtask leader: CNR(CSGI).

In the framework of the European cluster ECHOES, led by CSGI and created under the auspices of the EC, an open discussion has started about the best way to provide new services to private and public museums, libraries, archaeological areas, conservation institutes, in the field of material science. In fact, such projects are addressed to the development of new solutions for consolidation, cleaning, strengthening and protection of cultural heritage materials. Each of them involves important museums and institutions that are the end-users of the new solutions.

A survey of the demand for new solutions in that area is going to be prepared. An accurate evaluation of the RI response time, cost, effectiveness of the proposed solutions and impact on the collection management will be done.

Next fall a meeting will be organized to plan the first activities carried out within the ECHOES initiative. The interaction between ECHOES and E-RIHS will be addressed and some efforts will be dedicated to the possibility to provide new services in the field of material science R&D within the RI.

In particular, multicomponent art materials that are of interests for several different communities (paleo-anthropology, archaeology, conservation, social science and humanities, and others) will be considered in this feasibility study, because conventional conservation methods are often not usable and such cultural heritage is constantly under menace of irreversible degradation. A large demand is coming from these 'areas', specially from museums that are facing completely new degradation processes and are looking for new solutions.

Task 8.3 Catalogue of E-RIHS resources and services
Task leader: CNR – *Carlo Meghini*
This task concerns the design, creation and maintenance of an online catalogue of resources and services provided by E-RIHS. In addition to the typical services offered by all Catalogues, the E-RIHS Catalogue structure will also serve as the basis for accounting in-kind contributions. In E-RIHS PP, our task is to collect the required information to design the E-RIHS Catalogue, thereby preparing the ground for the future E-RIHS Catalogue.
CNR and CENIEH are collaborating on the elaboration of the catalogue and working on the next actions:
-   Creation of an ontology for representing and organizing the knowledge collected in the catalogue. The ontology will be aligned with those of similar research infrastructures, especially with that of PARTHENOS. The PARTHENOS ontology is called the Parthenos Entities Model (PEM), is an extension of the CIDOC CRM vocabulary, an ISO standard for cultural heritage which seems a promising venue for our work. CNR is involved in the development of the PEM and will therefore act as a *trait-de-union.*
-   Search and exploration of the existing catalogues for Heritage Science in order to reuse them as much as possible, keeping in mind that the mother of all catalogues in Cultural Heritage is Europeana.
-   Retrieval of the resources for populating the catalogue. In terms of resources, we intend all entities that the Catalogue will describe, so mainly datasets and services, but possibly also people, organizations, instruments, and others.
-   Defining users and relative use cases on the E-RIHS Catalogue.
-   CENIEH has already provided to CNR descriptions of services for registry into Parthenos Entities Model (PEM) and is looking for possible standard and vocabularies and official terminologies used in the field of HS for expressing these concepts as linked data.

WP8_DELIVERABLE DATES

	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36
	Feb 2017							Sept 2017					Feb 2018					July 2018		Sept 2018					Feb 2019				July 2019				Oct 2019		Dec 2019	Jan 2020
Task 8.1 **SERVICES** for new communities													■							■					■				■						■	
Task 8.2 FEASIBILITY STUDIES													■							■					■				■				■			
Task 8.3 **CATALOGUE** of E-RIHS													■							■					■					■						
	Starting Date							Prague Meeting					Amsterdam Meeting					1st Periodic Report		Warsaw Meeting					Madrid Meeting											End Date

■ Deliverable Date
■ Internal Report Date

1.2.9. Work package 9: Excellence and Innovation (FORTH)

The success and long-term sustainability of E-RIHS will rely on its capacity and means to foster scientific excellence and, in parallel, to identify, unfold, promote and exploit its innovation potential. Combining state-of-the-art infrastructures and high-level services will ensure E-RIHS becomes the place where most advanced scientific investigations of heritage will materialize and where collaboration between providers and users will enable the community to formulate and address unanswered interdisciplinary research questions through innovative approaches generating new knowledge for understanding the past and safeguarding the future of Heritage.

In the context of WP9, E-RIHS PP participants are collaborating with the aim of developing scientific ambitions that extend the current state of the art and lead to innovative developments for E-RIHS in the years to come, defining appropriate tools, methodological approaches and monitoring mechanisms.

Two main documents are under preparation that will pave the way forward: a) the E-RIHS Scientific Strategy and b) the Innovation Agenda. These are expected to serve as roadmaps for the development of next generation instruments, new research techniques, novel methodologies and knowledge management tools capable of advancing the state of the art across E-RIHS, introducing novel and efficient access services and offering unprecedented research opportunities to a broad spectrum of user communities including industry.

Main objectives
- Map the national and international RI landscape relevant to Heritage Science
- Define strategies for exploring novel opportunities and research challenges
- Elaborate the E-RIHS Scientific Vision and Scientific Strategy with access providers and users
- Identify the innovation potential in E-RIHS
- Assess opportunities for developing new technologies, tools and products
- Define strategy to engage industry as RI users or as partners in research and development

State of the Work Carried Out

Task 9.1 Excellence: priorities and strategy
Task leader: CNRS – *Loïc Bertrand*
Concept: The general aim in Task 9.1 is to monitor the landscape of the setting up of E-RIHS, to describe the main scientific ambitions of E-RIHS in the coming years and to outline what pathways will be followed to achieve them. Two main documents are scheduled in the framework of T9.1. The E-RIHS Scientific Vision is the introduction of the E-RIHS Scientific and Technical description, one of the core documents that will be produced to apply for the ERIC status. The E-RIHS Scientific Strategy will be a high-level book that will detail the topics announced in the E-RIHS Scientific Vision and in the E-RIHS Scientific and Technical Description

Scientific Vision

In the framework of Task 9.1, the E-RIHS Scientific Vision was discussed, elaborated and articulated in a comprehensive document, "*D9.1 - First version of the E-RIHS Scientific Vision*", delivered in March 2018 (M13). The coordination of the preparation of the Scientific Vision was carried out by Loïc Bertrand, Bénédicte Charbonnel and Sophie David (CNRS - IPANEMA), Marta Castillejo (IQFR-CSIC), Hilde De Clercq (KIK-IRPA) and Marika Spring (NG). The group has interacted on a regular basis and met regularly virtually and physically over the period. Several partners were invited to provide advice during these coordination work meetings. The main meetings of T9.1 were the following: Mar. 2017 in Florence, Aug. 2017 in Paris, Nov. 2017 in Brussels and Feb. 2018 in Amsterdam.

The work carried out within T9.1 was presented at E-RIHS PP interim and annual meetings. Discussions with the participants on the content of T9.1 documents have taken place. In addition, the Scientific Vision document was presented to national communities in several national consultations. The list of these meetings is the following:
  – Mar. 2017 in Florence (E-RIHS PP partners)
  – May 2017 in Brussels (E-RIHS PP partners)
  – May 2017 in Heraklion (E-RIHS PP partners)
  – Aug. 2017 in Paris (E-RIHS PP partners)
  – Sep. 2017 in Prague (E-RIHS PP partners)
  – Nov. 2017 in Brussels (E-RIHS PP partners)
  – Nov. 2017 in Vienna (Austrian National community)
  – Dec. 2017 in London (UK National community and IPERION CH users)
  – Jan. 2018 in Paris (French National community)
  – Feb. 2018 in Amsterdam (Dutch National community and E-RIHS PP partners).

Before each meeting, the latest version of the Scientific Vision drafted within T9.1 was circulated between participants who were encouraged to provide their feedback on the document. A six-page flyer and a poster illustrating the Scientific Vision were produced to encourage discussion among E-RIHS PP partners and national communities. As a result, more than 50 main contributions were received and a compromise was reached to produce the final version.
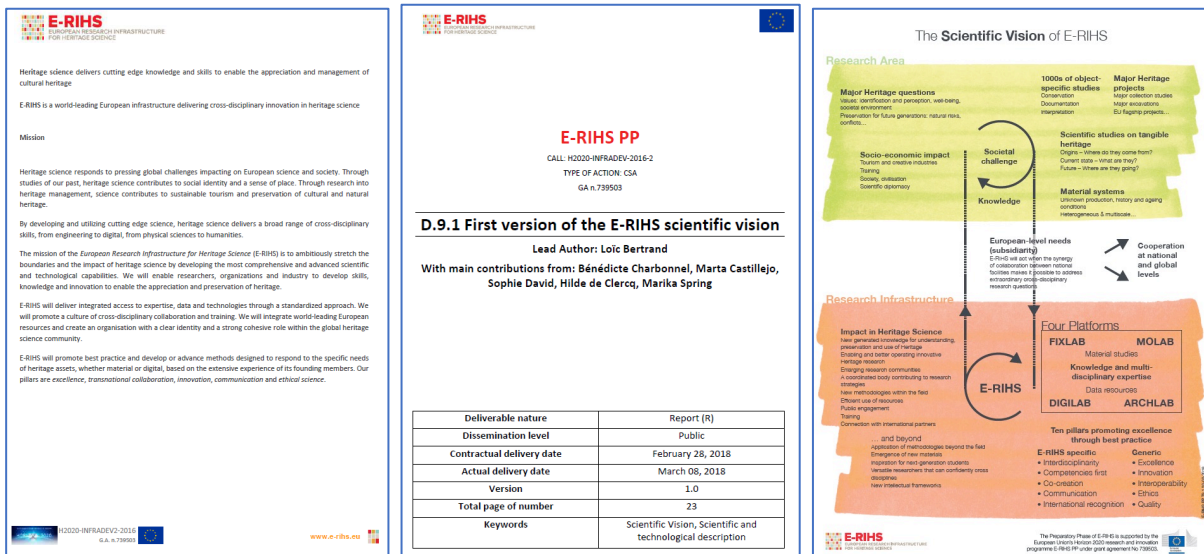
Figure 9.1 *The E-RIHS flyer (1st page), the Scientific Vision (D9.1 cover page) and the work poster.*

A major result of task 9.1, detailed in "D9.1 First version of the E-RIHS Scientific Vision", relates to the definition of a new paradigm, placing heritage at the heart of the whole rationale by recognizing the scientific specificities of the field and their impact on the entire research process. Ten core values upon which the scientific strategy of E-RIHS builds were identified:

1. Competencies first – Considering skills as central
2. Interdisciplinarity – Optimising work for teams with complementary culture and practices
3. Co-creation – Building on a paradigm that balances contributions from all participants
4. Communication – Exploiting the public-facing nature of heritage institutions
5. Excellence – Supporting outstanding projects
6. Interoperability – Promoting data sharing, intelligent instruments and open access policies
7. Innovation – Stimulating evolution of E-RIHS and in heritage science
8. International recognition – Collaborating at global level
9. Ethics – Respecting heritage values and encouraging responsible research
10. Quality – Guaranteeing the best user experience.

Scientific Strategy

Since November 2017, work has intensified concerning the development of the Scientific Strategy. To date, the working methodology has been defined. A preliminary *Table of contents* of the document has been elaborated in May 2017 within T9.1 and updated after E-RIHS PP meetings in Brussels in November 2017 and in Amsterdam in February 2018. The state of the art has been reviewed and shared within the group in December 2017. First drafts of several parts of the future Scientific Strategy E-RIHS PP have been written. E-RIHS PP partners are going to be requested to contribute to the E-RIHS Scientific Strategy from September 2018 on. In that respect, instructions for contributions have been written and prospective contributors identified.

As foreseen in the DoW, a major International Symposium entitled "Heritage, Science and Technologies – Frontiers in Heritage Science" is being organized to nurture the reflection on the E-RIHS Scientific Strategy. This prestigious event will be held at the Académie des sciences, Institut de France, Paris, from 13th to 16th February 2019 and led to much activity in the reporting period. CNRS IPANEMA and the French Académie des sciences are leading the organisation of the symposium, in partnership with Academies of Sciences from many countries (Algeria, Austria, Czech Republic, Italy,

The Netherlands, UK, and Sweden). The symposium will be composed of a dedicated ERIHS meeting with the character of a workshop focusing on the Scientific Strategy (13 February) and with invited attendance, a scientific symposium (14, 15 February) open to the research community and a general public event (16 February). The E-RIHS dedicated event will gather individual researchers outside ERIHS-PP who have the potential to provide insight that addresses gaps in the scientific strategy. The objective is to present the Scientific Strategy and to gather feedbacks and comments to finalize the document before its delivery. The scientific symposium will gather internationally renowned scientists, from a large range of countries, and from the different disciplines related to heritage materials. It will provide a constructive synthesis of current works and future perspectives in the field of heritage science and thus also contribute to the final reflection on the Scientific Strategy. In March 2017, an International Scientific Advisory Committee and a Local Organizing Committee were set up for this event. The International Scientific Advisory Committee met in March 2017, October 2017, January 2018, and April 2018. The Local organizing Committee is meeting once per month. During the reporting period, a Scientific Advisory Committee and a Local Organizing Committee were set up, a draft programme of the event was elaborated, and prospective speakers were contacted.

Task 9.2 Exploitation of E-RIHS capacities: innovation, transfer of knowledge and marketing
Task leader: FORTH– *Demetrios Anglos*
Concept: In Task 9.2, focus is placed on Innovation as the second pillar of E-RIHS success in balance with Scientific Excellence. The aim of this Task is to explore and map the present innovation landscape of E-RIHS and identify and suggest pathways for continuing and enhancing the innovation potential and output of E-RIHS, preparing the Innovation Agenda.

Innovation Analysis
A thorough analysis was performed with the aim to map the Innovation Background in E-RIHS and the broader HS RI communities. The analysis was based on extensive qualitative and quantitative research performed by E-RIHS participants. Furthermore, a series of expert interviews were conducted with participants of E-RIHS, and with experts external to the project and two major surveys were carried out: a) E-RIHS PP WP9.2 Innovation Survey and b) ERIC's National Contact Points Innovation Survey.
As a result of this research, a document has been produced, 'D9.2 – Analysis of the Innovation Background' which reviews the current innovation background for the E-RIHS partnership and assesses the existing heritage science innovation landscape. It discusses innovation as a general concept and more specifically in relation to RI's and Heritage Science. It traces good practices, successful examples and failures as well and examines strengths and limitations in different organizations within the E-RIHS partnership and beyond concerning innovation management and exploitation strategies. The role of the providers, the users and that of industry (including a definition of industry in relation to HS) is analysed. A set of key performance indicators (KPIs) is presented that are intended to provide a tool for a measurable assessment of innovation in various stages of development.
In late July 2018, D9.2 was deposited in D4Science – the designated repository for the ERIHS PP project. It will be the analytic backbone of the Innovation Agenda, to be developed as part of WP9.2 by 2019.
Main contributors to the Innovation Analysis (D9.1) have been Demetrios Anglos, Sophia Sotiropoulou and Maria Makridaki (FORTH), Mary Teehan and Anthony Corns (DP), and Michal

Vopálenský (ITAM). The group met regularly virtually (bi-monthly) and physically (during project meetings) in the process of preparing D9.1 and interacted with several colleagues within the project receiving feedback on the document and collecting ideas and opinions on innovation with respect to HS Ris.

The progress of the work was in T9.2 was presented at E-RIHS PP interim and annual meetings as follows:

 – Mar. 2017 in Florence (E-RIHS PP partners)
 – Nov. 2017 in Brussels (E-RIHS PP partners)
 – Dec. 2017 in London (UK National community and IPERION CH users)
 – Feb. 2018 in Amsterdam (Dutch National community and E-RIHS PP partners).

Innovation Agenda

The progressive development of the E-RIHS Innovation ecosystem as an open, co-creative environment, generating ideas, evolving and adaptive to address unfulfilled needs and translate them into new research areas is considered as the optimum field of interaction, exchange and cooperation among performers (users and providers) in the Heritage Community.

However, the concept of innovation is relatively new within the RIs management. Although novel ideas are at the core of research and development of RIs, the connecting links of the innovation chain seem to be loose and work needs to be done towards an effective innovation management. A necessity for coordinated strategic actions was discerned through the Analysis of the Innovation Background. In fact, the analysis allowed to identify key areas to be worked on in tandem with the E-RIHS Scientific Agenda, Catalogue of Resources and Services and Sustainability Plan and to be produced in the Innovation Agenda.
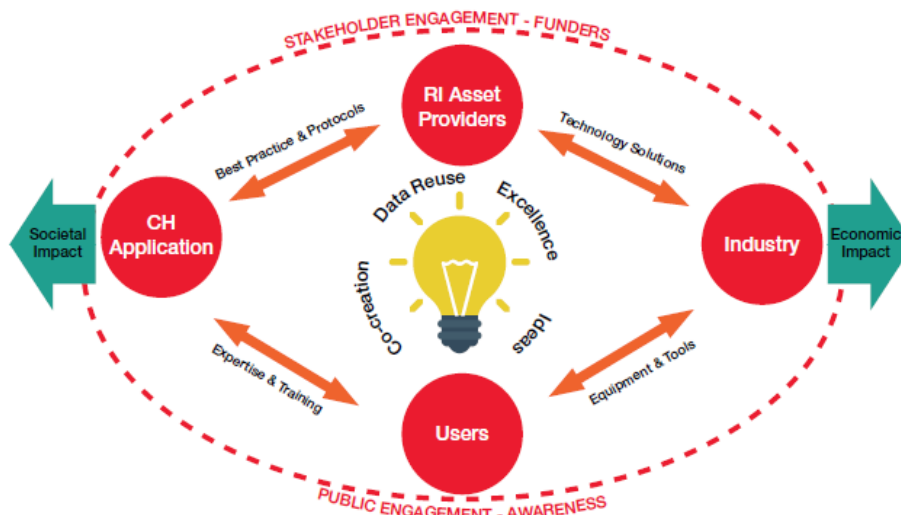
Figure 9.2 *Graphical representation of the Innovation Ecosystem and the interplay of actors in HS innovation.*

At this stage a draft outline of the Innovation Agenda has been proposed with the focus areas and priorities being under discussion among the partners. Among others the objectives of the Innovation Agenda will be to:

 - review procedures and mechanisms, which are necessary to enable proper monitoring and evaluation of existing or emerging innovations that could potentially give rise to market-oriented exploitation.

- engage in the discussion, technology and innovation units (for example, technology transfer offices) that can provide relevant input concerning transfer of knowledge pathways, technology exploitation opportunities and point to key areas for development.
- propose means for enhancing awareness of researchers concerning the emerging potential of new instruments, methods and tools for heritage analysis and data/ knowledge management.
- implement in parallel, the involvement of the broader user communities, as these are the ones defining new challenges that can result in the development of technologies and innovation.

Finally, the Agenda will define priorities and set up the procedures necessary for producing and maintaining a dynamic technology development and innovation agenda including exploitation policy placing emphasis on the added value arising from E-RIHS as a whole.

Considering the breadth of the endeavour, the group working on the Innovation Agenda is being interfaced with the Scientific Strategy group (Task 9.1) and groups active in other WPs particularly on Access (WP5), Sustainability (WP6), Training (WP7) and E-RIHS services (WP8).

Problems

Most of the work carried out so far in WP9 has demanded extensive interactions among the teams and required several iterations as the concepts put forward are novel and dynamically evolving at an international level (for example, the role of RIs as tools for economic development, open innovation, social innovation etc). Additionally, in the case of Task 9.2, design and analysis of the surveys conducted required significantly longer time.

As a result, delays have been incurred, particularly concerning completion of D9.2.

At this stage communication among participants is quite more effective in comparison with the early stages of the project, and synchronization with the developments in other WP's (particularly WP5, 6, 7 and 8) helps significantly in accelerating the work.

Achievements

Deliverables 9.1 and 9.2 constitute two distinct achievements of WP9.

In parallel, through discussions and contacts with experts and colleagues (at conferences, public events etc) E-RIHS and its future role is being increasingly communicated in Europe and internationally generating valuable feedback that helps to formulate and clarify aspects related to grand scientific challenges in the field of Heritage Science.

Considering that E-RIHS participants are also members of the National E-RIHS nodes or structures equivalent to a national E-RIHS node at different countries, developments in E-RIHS PP concerning scientific excellence and innovation are diffusing towards the national nodes and good practices established at national level are being used to enrich the E-RIHS scientific strategy and innovation agenda.

1.2.10. Work package 10: Advocacy, Communication and Dissemination (CYI)

State of the work carried out

WP10 aims to plan, design and provide the E-RIHS gateway to the outside world. Based on a participatory and inclusive approach and public engagement, its dissemination and communication strategy has to reflect the vision and overall activity of E-RIHS as a European RI and develop tailored

dissemination strategies for stakeholders, through digital and physical channels of communication in a dialogue with national E-RIHS representatives and National Hubs. On the other hand, WP 10 aims to create the critical mass of information and disseminate it at conferences, events, through digital and physical media, etc. in order to assure E-RIHS presentation to citizens, researchers, investors, private and public bodies, institutions, academic universities or research centres wishing to collaborate with E-RIHS.

To reach the goal of an efficient communication, from February 1, 2017 to July 31, 2018 WP 10 carried out a first set of activities that were preparatory to the correct functioning of E-RIHS internal and external communication.

Task 10.1 Design, development and implementation of the dissemination and communication strategy and **Task 10.2 Creation of dissemination and communication materials**

Task leader: CYI – *Sorin Hermon*

The first step of the T10.1 and T10.2 was to draft the E-RIHS Communication and Dissemination Plan. The document is part of the D10.1, delivered on December 19, 2017, and it has been made available in the internal communication tools used by the partners (D4science and Basecamp). It is a live document, for this reason partners can give suggestions to the communication office at any time.

Together with this document, another document entitled "Visual Identity Guidelines" has been drafted and shared with partners with the aim of creating a coordinated communication and image of the infrastructure, to make materials immediately recognizable, to reinforce the reputation of the infrastructure, and to have an effective communication.

Basic communication materials have been designed:

1. Logo. While being currently registered as a trademark, the E-RIHS logo is currently available to all partners so that all national nodes can be aligned with E-RIHS EU by inflecting the same logo in a national version (e.g.: E-RIHS.it, E-RIHS.fr, etc.)
2. Template for communication such as A4 Letterhead, Power Point / Keynote presentation, etc.
3. Brochure to be distributed in meetings and events in order to better spread E-RIHS message and activities.

Tools were set up for internal and external communication:

1. Basecamp, D4Science, Zoom, Eventbrite. These web-based applications are used to improve the internal communication strategy and to ensure a constant and effective exchange of information between partners as well as an effective and shared management of the project. D4science and Basecamp are used as repositories of all the project documentation.
2. E-mails. Specific e-mail accounts (coordinator, communication office, coordination office) have been created in order to answer different requests or needs. The different accounts guarantee that e-mails arrive to competent people in charge of answering.
3. E-RIHS website. The website is fully functioning and updated on regular basis. The domain www.e-rihs.eu is live since March 2016. It is the main managing, communication and dissemination platform of E-RIHS. The website provides links to E-RIHS social media profiles and national hubs websites.
4. National nodes websites were developed by some partners such as Cyprus, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Spain, Slovenia and United Kingdom on the basis of the distributed E-RIHS website template.

Task 10.3 Development and maintenance of the E-RIHS website
Task leader: CNR – *Elisabetta Andreassi*
This task, besides launching and updating constantly the website, is also devoted to create a Digital Hub for Research and Cooperation in the field of Heritage Science. By creating the Heritage Hub, E-RIHS will have an easy-to-use but powerful collaboration platform able to act as an access point for information, services, good practices, training and virtual meetings for researchers, users, stakeholders to discuss topics of interest. This is why E-RIHS launched a call for tender for the design and development of a semantic cloud service, SCHEME (Semantic Content retrieval engine for the Heritage hub EmpowErment), composed of two functionalities: a semantic web tool and a collaboration platform. By using semantic technologies, SCHEME provides a selection of content automatically taken from the web and filtered in order to present only the information related to the main themes of E-RIHS. Furthermore, SCHEME is useful to gather external data and optimize content and can offer a social media analysis platform, to search for relevant posts and identify most used concepts, hashtags, web pages and sites cited in social discussions, geographical location of users, influencers, etc.

To increase the visibility and reputation of E-RIHS and to keep in touch quickly with other stakeholders, the communication office created social media accounts. Fully functioned and regularly updated accounts at Facebook, Twitter, Vimeo and Youtube are currently spreading the message of E-RIHS all over the world. Trends of the accounts are periodically monitored and analysed.

Task 10.4 Events and public engagement
Task leader: PIN – *Franco Niccolucci*

Several E-RIHS national nodes were established (Belgium, Germany, Hungary, Ireland, Poland, Portugal, United Kingdom) with relative national meetings and the national coordinators presented the goals and activities to national communities and to the E-RIHS PP partners.
The vision and the activities of E-RIHS were disseminated also at international conferences and workshops, by way of example:
- CNR organized an international workshop entitled "Towards a European Research Infrastructure for Heritage Science, held in Florence, 29.03.2017;
- DP participated in the Annual Conference of the European Association of Archaeologists within the Session 237: Archaeological practices and Knowledge in the digital environment. Theme 5 - Comparing Archaeology Across Regions and Periods and presented a speech on "E-RIHS: Developing an integrated research infrastructure for heritage science" in Maastricht, The Netherlands, 31.08.2017
- CSIC presented E-RIHS at the international congress "TechnoHeritage", held in Cadiz, Spain, 21-24.05.2017 (abstract available at: http://technoheritage2017.uca.es/wp-content/uploads/2016/07/abstract_book.pdf).
- E-RIHS has participated in a workshop organized by the VI-SEEM (vi-seem.eu) and SIMDAS (www.simdas.eu/) projects at the Cyprus Institute, Nicosia, Cyprus on 25 and 26 June 2018. The workshop, titled "Data Management and Semantic Structures for Cross-Disciplinary Research in the SEEM Region" was aimed at bringing user communities from Life Sciences,

Climatology and Digital Cultural Heritage together by providing them a stage for sharing knowledge, good practices and experiences.

Problems

Despite the efforts, some problems occurred and it will be necessary to address them.

1. Partners expressed difficulties in using internal communication tools as D4Science and Basecamp.
2. Even though rules to set-up the national node website via the Visual Identity Guidelines have been prepared and disseminated, however so far only seven (7) partners currently have their own websites and only one followed exactly the guidelines concerning the website template. An evaluation of the situation is required.
3. Though the call for tender for the Digital Hub was launched at the end of March 2018, the tender has been awarded on August 2, 2018 but the contract will be signed in September only.
4. At this stage of E-RIHS, communication concerns especially administrative/strategic issues, for this reason it may be more difficult to engage large public.
5. D10.1 was delivered slightly late. Extra time was necessary to draft the "E-RIHS visual guidelines", the main document thought for the partners and used to design communication materials and websites of the national nodes in a coordinated way and to increase the E-RIHS reputation.
6. Due to administrative procedures, the tender for the Digital Hub was carried out on delay. For this reason, D10.2 "Heritage Hub on-line in project website" will be delivered on delay, probably in Spring 2019.

Achievements

The communication and dissemination plan (D10.1) has been drafted in two versions: a longer one, represented by the text of the deliverable with technical details and timetable, and a short one to help E-RIHS partners to have communication tips at a glance. The document also contains the "E-RIHS visual guidelines" (read above) in annex.

Periodic reports on external communication are prepared. Even if E-RIHS communication and dissemination are focused on specific targets, reports show a positive trend in E-RIHS activities: Number of accesses in E-RIHS social media and website are continuously increasing showing a true interest of the scientific community in setting up this research infrastructure and creating new fruitful and cross-disciplinary collaborations.

1.2.11. **Work package 11: Implementation (CNR)**

State of the work carried out

The aim of WP11 is to prepare the two base documents for E-RIHS ERIC to be established, which are the Business and the Implementation Plans. To do this, WP11 is following the preparatory work of documents and strategies in all the other WPs in E-RIHS PP in order to minimize ongoing divergences in aims and strategies, contributing to the discussions on all the topics of interest for the aims of the WP (almost all the topics treated by other WPs are relevant for the two plans).

The responsibility for the production of the final deliverables, as expected, is shared with all the partners, under the constant advise and supervision of the Stakeholder's Board, and with the guidance of the informal (yet to be established) Interim Governance group.

Task 11.1 Integration and harmonization of planning documents
Task leader: CNR – *Luca Pezzati*
Task 11.1 started timely at M1 (February 2017) and it is now in progress. The expected deliverable (D11.1) will be the E-RIHS ERIC Business Plan (version 1.0) at M27.
In the first part of the project, the work of T11.1 consisted in following the proceedings of all the other WPs to gather an overview on how to compile a successful BP for E-RIHS ERIC. Some preliminary work produced by the Integrating Activity IPERION CH was also considered and its results added to the available pool of information. Most of the needed material was of course still in a preliminary form at M18, but it is expected that the BP will be drafted on time for D11.1 to be submitted at M27.
In the meantime, due to a redesigning of the timing of E-RIHS preparation, T11.1 contributed largely to the drafting of the Scientific and Technical Description of E-RIHS ERIC. A document which is needed to start the process of submitting Step 1 towards the ERIC. This activity was not clearly foreseen at the beginning, but it is now on going with success. The S&TD can be indeed considered as an extract of the larger Business Plan. It is expected that the first draft of the S&TD will be ready by October 2018 (M21).

Task 11.2 E-RIHS implementation strategy
Task leader: CNR – *Luca Pezzati*

Task 11.2 started timely at M13 (February 2018) and it is now in progress. The expected deliverable (D11.2) will be the E-RIHS ERIC implementation plan at M36. As for T11.1, this Task is collecting and organizing fundamental material to produce E-RIHS ERIC Implementation Plan.

Problems
No significant problems to report.

Achievements
The main achievement of WP11 in this first half of the project was the maintenance of a high level of coherence within the different discussions happening in all other WPs, thus helping to converge on a coherent strategy for implementation of E-RIHS ERIC through harmonic integration of results and documents elaborated in all the project WPs.

1.3. Impact

The information on section 2.1 of the DoA are still relevant and do not need to be updated.

2. Update of the plan for exploitation and dissemination of result (if applicable)

The plan for exploitation and dissemination of results as described in the DoA do not need to be updated.

3. Update of the data management plan (if applicable)

E-RIHS is fully complaint with EU GDPR regulations (25 May 2018). As far as collection and storage of personal data are concerned in particular in relation to registration to public events organized by E-RIHS, subscription to mailing list managed by E-RIHS and use of pictures and videos.

4. Follow-up of recommendations and comments from previous review(s) (if applicable)

Not applicable. This is the first report.

5. Deviations from Annex 1 and Annex 2 (if applicable)

There were not significant deviations from the DoA.

It has to be highlighted that beneficiary # 4 "ITAM" was not able to provide updated information on the SMEs status. Indeed, ITAM administration needs to further investigate the SME self-declareed status within the organization itself. Figures provided in the system are not real.

5.1. Tasks

There were not significant deviations from the task activities as planned in the DoA.

5.2. Use of resources

Include explanations on deviations of the use of resources between actual and planned use of resources in Annex 1, especially related to person-months per work package.

- Beneficiary # 7 CENIEH (CONSORCIO PARA LA CONSTRUCCION, EQUIPAMIENTO Y EXPLOTACION DEL CENTRO NACIONAL DE INVESTIGACION SOBRE LA EVOLUCION HUMANA) is reporting in RP1 73% of the total effort allocated due to the fact that extra effort was needed to kick start their activities as new comers

- Third Party #2: MCC (MINISTERE DE LA CULTURE ET DE LA COMMUNICATION), linked TP of Beneficiary #8 CNRS is reporting in RP1 more than 100% of the total effort allocated due to the fact that extra effort was needed to kick start their activities

- Beneficiary #12 DP (THE DISCOVERY PROGRAMME: CENTRE FOR ARCHAEOLOGY AND INNOVATION IRELAND) is reporting in RP1 83% of the total personnel costs allocated due to the fact that the start of the project extra work was needed respectively in Ireland to get a successful RI established for heritage science as they were coming from a less progressed state compared to other partner countries.

The concerned Parties are aware that they have to implement the activities according to the the GA using additional resources not reimbursed by E-RIHS, if needed

Third party #1 HERC (UNIVERSIDADE DE EVORA), linked TP of Beneficiary #18 LNEC (LABORATORIO NACIONAL DE ENGENHARIA CIVIL) are not submitting any financial statements related to RP1. Due to a shortage in human resources HERC could not perform any work, being replaced by LNEC.

They did attend the meeting in Amsterdam but because they did not do work, they decided not to claim any expenses and to cover the costs of travel with funds from the Portuguese research infrastructure.

5.2.1. Unforeseen subcontracting (if applicable)

Not applicable

5.2.2. Unforeseen use of in kind contribution from third party against payment or free of charges (if applicable)

Not applicable